

**Tuberculosis in  
Los Angeles County  
Surveillance Report 2015**





# Snapshot: Tuberculosis in Los Angeles County, 2015

## 2015 Case Count and Rate

**604**      **6.3**

Number of confirmed TB cases      TB incidence rate per 100,000 persons

**>3.1%**      Percent increase between 2014 and 2015

## Demographic and Social Characteristics

45% of cases were comprised of Asians

14.7% increase in people 55-64 years of age between 2014 and 2015

5 children under five years old were confirmed with TB disease

19.4% increase in females with TB from 2014 to 2015

7.5% of TB cases were homeless within the past year

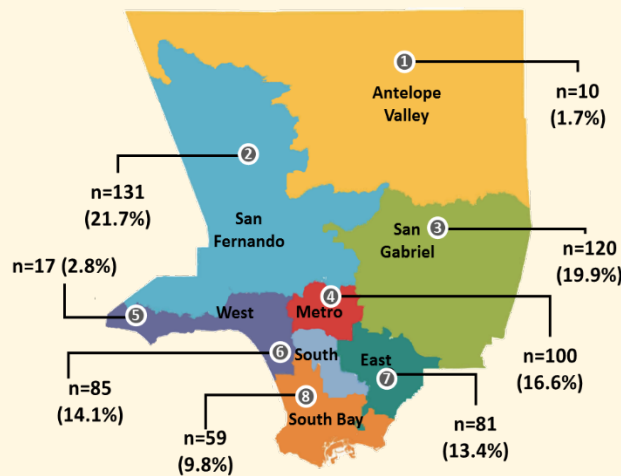
39% of adults had 1 or more medical comorbidity

## Tuberculosis Cases by Service Planning Areas (SPA)

SPA 2, SPA 3, and SPA 4 reported the most TB cases

21.7% of TB cases were reported by SPA 2

SPA 7 had a 37% increase in cases between 2014 and 2015 (59 to 81, respectively)



## Clinical Characteristics

72% of cases had only pulmonary TB

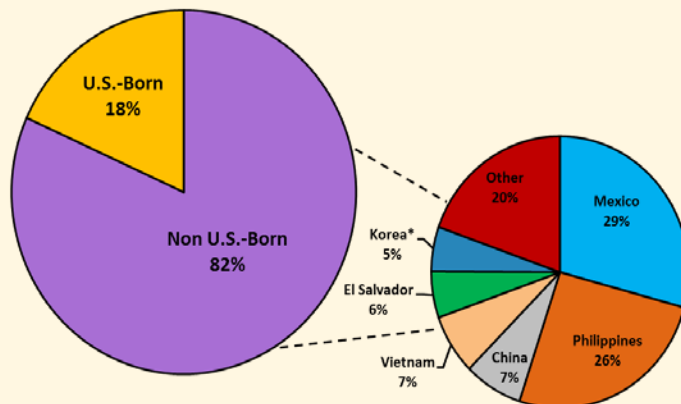
1.2% (n=6) of TB cases had multi-drug resistant (MDR) TB

2.8% (n=15) of TB cases were reported to be HIV infected, among who 53.3% were Hispanic and 66.7% were born outside the U.S.

## Place of Birth

82% of TB cases were born outside the U.S.

Among cases born outside the U.S., 29% were from Mexico and 26% from the Philippines



34 Countries were represented among TB cases

Top 7 Countries	No. of Cases
Mexico	143 (24%)
Philippines	127 (21%)
United States	110 (18%)
China	36 (6%)
Vietnam	35 (6%)
El Salvador	27 (5%)
Korea*	26 (4%)

\*Includes both North and South Korea

Data exclude Long Beach and Pasadena TB cases.

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# Tuberculosis Control Program

## VISION

**TB is eliminated from Los Angeles County**

## MISSION

**To prevent the transmission of TB  
within Los Angeles County**





**BARBARA FERRER, Ph.D., M.P.H., M.Ed.**  
Director

**JEFFREY D. GUNZENHAUSER, M.D., M.P.H.**  
Interim Health Officer

**CYNTHIA A. HARDING, M.P.H.**  
Chief Deputy Director

**ROBERT KIM-FARLEY, M.D., M.P.H.**  
Director, Communicable Disease Control and Prevention

**JULIE HIGASHI, M.D., Ph.D.**  
Director, Tuberculosis Control Program  
2615 S. Grand Avenue, Room 507  
Los Angeles, CA 90007  
TEL (213) 745-0846 • FAX (213) 749-0926

[www.publichealth.lacounty.gov](http://www.publichealth.lacounty.gov)

April 13, 2017

Dear Colleagues,

I am pleased to provide you with the 2015 "Tuberculosis in Los Angeles County: Surveillance Report." This report examines and presents a snapshot of tuberculosis (TB) in Los Angeles County (LAC). While TB cases continue to decline in LAC as a whole, in 2015, there was an increase from 586 confirmed cases in 2014 to 604 confirmed cases in 2015. Similar to past years, our tuberculosis case rate (6.3 per 100,000) was higher than the overall rate for California (5.5 per 100,000) and the United States (3.0 per 100,000).

We see progress from 2011 to 2015, reporting declines in the percentage of all TB cases coinfecting with HIV from 6.7% to 2.8% and the percent of all TB cases dying with TB from 11.5% to 9.1%. However, many challenges remain. In 2015, a majority of TB cases were seen among racial/ethnic minority individuals, most of whom were foreign-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 TBI to TB disease continues to be a focus for our program. Improving initiation and completion of treatment of TBI using the isoniazid 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,

A handwritten signature in black ink that reads "Julie Higashi MD PhD".

Julie M. Higashi, M.D., Ph.D.  
Director, Tuberculosis Control Program  
Los Angeles County Department of Public Health

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Director

Jeffrey Gunzenhauser, M.D., MPH  
Interim Health Officer

**Los Angeles County Department of Public Health**  
**Division of Communicable Disease Control and Prevention**

Robert Kim-Farley, M.D., MPH  
Director



## **Tuberculosis Control Program**

Julie M. Higashi, M.D., Ph.D.  
Director

Alicia H. Chang, M.D., M.S.  
Deputy Director

### **Administration Unit**

Nayeli Aguirre, Yolanda Martinez, Cherry Tam

### **CDC Unit**

Erika Alex, Erin Anderson, Sara Bemisdarfer, Kim Do, Nora Fritz, Bezaleel Gebru, Jamiee Gomez, Lauren Linde, Andrea Lomeli, Stuart McMullen, Wendy Pernal, Shameer Poonja

### **Data Management & Information Technology Unit**

Kai-Jen Cheng, Byron Garcia, Craig Toyota

### **Education & Evaluation Unit**

Eileen Alagot, Rosarina Albert, Marthe Bangura, Sandra Bible, Avis Brooks, Toi Brown, Stephanie Burton, Natividad Bustos, Sharelle Carr, Maria (Cris) Cuevas, Eunice Edmonds, Antoinette Edwards, Hasmik Grigorian, Javon Harvey, Doris Jones, April King-Todd, Rita Larranaga, Jose Leiva, Robert Miodovski, Cassy Morris, Yen Nguyen, Rebbie Ortega, Socorro Rodriguez, Erika Siever, Diana Sosa, Toni Stephens, Claire Torres

### **Epidemiology & Research Unit**

Terese Brookins, Alicia H. Chang, Jo Kay Ghosh, Mariah Kalmin, Ying Ker, Edward Lan, Kay Parks, Samir Patel, Brittney Redick, Christopher Rogers, Monica Rosales, Josephine Yumul

### **Medical Consultation Unit**

Steven K. Hwang, M.D., Rashmi J. Singh, M.D.

### **Patient Services & Reporting Unit**

Sunny Y. Chun, Nadine Flores, Ana Delia Hernandez, Karen Hurst, Gwendolyn Jones, Dora Klee, Maria Mejia, Crystal Mingo, Hattie Morris, Alejandra Novelo, Rebecca Park, Leticia Reyna-Terry, Cathy Ruiz, Jimmy Ruiz, Nichelle Simon, Yingyos Sinitvong, Jeanne Soukup, Tearah Taylor, Cynthia Tello, Maria Thomas, Elizabeth Valencia, Salina Yu

### **Public Health Investigation Unit**

Katrin Eskandary, Bruce Hudley, Carlos Reyes, Sergio Triana

### **Volunteers**

Fatima Castaneda, Jennifer Kim, Sandra Martinez, Dean Prince

# Tuberculosis in Los Angeles County: Surveillance Report 2015

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**Prepared by:** Monica Rosales, Ph.D., M.S.

**Edited by:** Alicia H. Chang, M.D., M.S.; Julie M. Higashi, M.D., Ph.D.; Shameer Poonja; April King-Todd

**Cover:** Cover art by Christopher Rogers

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# Background

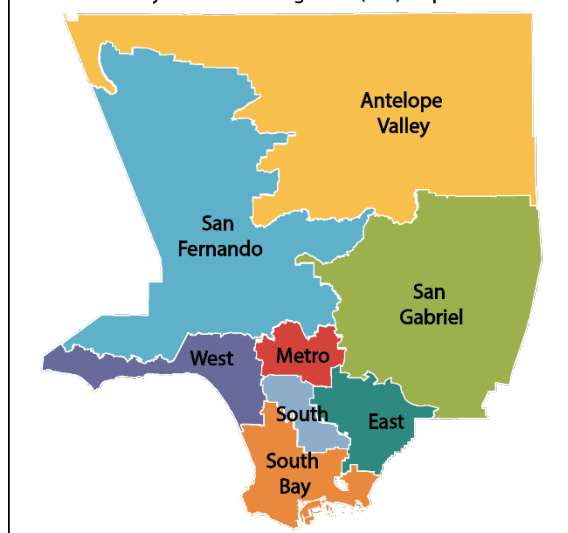
## LOS ANGELES COUNTY: DEMOGRAPHIC PROFILE

With its population of 10 million<sup>1</sup>, Los Angeles (LA) County is one of the nation's largest counties spanning over 4,000 square miles<sup>2</sup>. 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, 2% Native American/American Indian, and 26% Non-Hispanic White populations<sup>1</sup>. 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 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<sup>1</sup>.

Due to its large size, LA County is divided into 8 smaller geographic regions or Service Planning Areas (SPAs) 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 screening and treatment services. In 2015,

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 and 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).

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



## 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 tuberculosis 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 tuberculosis cases and suspects from 116 private hospitals, one VA hospital, and many private medical providers. Throughout the county's 8 SPAs, tuberculosis patients receive services at one of LA County Public Health Clinics, three County hospitals, the County Jail medical services, or from 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 goals 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 follows patients 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 patients and their contacts. The MDR-TB public health nurse monitors about 20 MDR-TB patients (both active and inactive) on a yearly basis. The public health nurse also monitors patients with TB strains exhibiting other drug resistance patterns but that do not meet the criteria for MDR-TB.

### **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 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 patients 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 2015, the unit processed 450 hospital admissions, and participated in numerous phone consultations.

### **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, 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 2015, the unit provided incentives to 342 patients; 68 patients were housed, and 28,000 incentive units were distributed.

### **Public Health Investigation and Legal Intervention**

This section locates non-adherent patients and returns them to 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 2015, the unit processed 58 referrals and 18 health officer orders of 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, established in 2015 to improve contact investigation (CI) processes, has oversight responsibilities for 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. Cohort review was implemented for 3 additional CHS health centers and new cohort review tools were developed. The section continues to maintain the program's CI database to enhance the tracking of all CIs that are reviewed.

#### **Education, Partnership and Community Outreach**

This section plans, develops, and delivers TB educational training to increase awareness and knowledge of TB infection and 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 LAC. A strong evidence-based evaluation component is also incorporated into educational sessions. Section 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 to promote delivery of targeted testing and treatment of TB infection. In 2015, this section provided 6 TB CME conferences, led the biannual new nurse orientation and biannual new student nurse orientation, trained 71 CHS nurses and MDs on CI, and organized and hosted the World TB Day event with over 100 participants and 21 agencies. Designated staff also participates nationally with the TB Education and Training Network. In 2015, this section initiated onsite targeted testing using T-Spot at a targeted local homeless shelter to facilitate referrals for chest x-

rays and early initiation of treatment for those with TB infection using a short course regimen and incentives.

### **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 with the TB Program Evaluation Network and submit annual reports describing activities including challenges and barriers, and progress toward CDC performance targets. In addition, the staff in this section organize joint CHS and TB Control Cohort Reviews which includes review of performance indicators as well as individual and aggregate patient outcomes on a quarterly basis for staff in the public health centers.

### **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 TB patient files, including files for patients with TB infection who receive 3HP. 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. In 2015, this section entered data from over 45,000 forms into TRIMS.

### **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, ensures high quality reporting of TB epidemiological data, monitors data for high priority TB clusters and outbreaks, evaluates outcomes for outbreak response and other program activities, and supports ongoing quality improvement and program evaluation activities. In 2015, the unit conducted data analyses for 12 main reports, 74 data requests and executive assignments, and staff presented TB data at conferences and meetings including 4 first-authored and 2 co-authored posters. Also, 3 staff received awards to attend the Western Users of SAS Software Educational Forum and Conference.

### **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 2015, the team authored a surveillance report and 4 fact sheets, including new content and enhanced visual presentation to communicate LAC TB data to a broad audience. The team provided data support for 16 quarterly Cohort Review meetings at 5 public health clinics, with the aim to continue 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 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 population. In 2015, in conjunction with the Genotype Cluster Identification and Assessment Unit and the Contact Investigation Monitoring and Assessment unit, this team offered data management and support services for 11 complex Cls. Also, in support of the implementation of the DPH Guidelines for Shelters, 'Preventing Tuberculosis (TB) in Homeless Shelters', the unit continued to work on TB Clearance and Alert data by entering it into the Homeless shelter's Homeless Management Information System (HMIS).

## 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 patient interviewing services, data management support, and contact investigation screening services. Index patient interviewing services target populations at high risk for TB transmission, including patients experiencing homelessness and patients 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

### Tuberculosis Disease

Tuberculosis (TB) is an airborne disease caused by *Mycobacterium tuberculosis* complex (*M. tuberculosis*)<sup>3</sup>. 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<sup>3</sup>. 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 also 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<sup>4</sup>. 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 tuberculosis infection<sup>5</sup>.

### **Tuberculosis (TB) 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<sup>3</sup>. Global estimates indicate that 1/3 of the world's population has TB infection<sup>6, 7</sup>. In the U.S. it is estimated that about 11 million people (4%) have TB infection<sup>6</sup>. If these individuals are not treated, approximately 5-10% of them will be at risk of progressing to active TB disease<sup>6</sup>. 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 5<sup>th</sup> leading cause of death, with about 10% of adults having ever been diagnosed<sup>8, 9</sup>. 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 2015, there were a total of 604 cases of tuberculosis (TB) confirmed in Los Angeles (LA) County. This represents a 3.1% increase from 586 cases in 2014 (Table 1). The TB incidence rate remained stable from 6.2 per 100,000 in 2014 to 6.3 per 100,000 in 2015 (Figure 1). LA County reported the 10<sup>th</sup> highest TB incidence rate among 61 California reporting health jurisdictions. The TB incidence rate in LA County in 2015 was higher than the overall state incidence rate (5.5 per 100,000)<sup>10</sup> and more than twice the national incidence rate (3.0 per 100,000)<sup>11</sup> (Box 2). In terms of case volume, LA County is the local health jurisdiction with the highest number of TB cases in the United States. LA County alone reported more TB cases than all states in the U.S. except California (to which LA County belongs), New York, and Texas.

<b>Box 2. TB Incidence Rates, 2015</b>			
	<b>LA County</b>	<b>California*</b>	<b>United States**</b>
<b>Total Cases</b>	604	2,137	9,563
<b>Rate per 100,000</b>	6.3	5.5	3.0
*Report on Tuberculosis in California 2015, CDPH, 2016. **Leveling of Tuberculosis Incidence - United States 2013-2015, MMWR 2016.			

## AGE AND SEX

### Age Distribution

Thirty-two percent of TB cases (n=193) occurred among persons 65 years of age and older, representing an important demographic group for TB risk (Table 1). Additionally, persons aged 15-34 years and persons aged 55-64 years contributed 110 (18%) and 117 (19%) TB cases, respectively (Table 1). The TB incidence rate was highest for people 65 years and older (16.2 per 100,000), followed by individuals 55-64 years of age (10.6 per 100,000), by those 45-54 years of age (8.2 per 100,000), and by those 35-44 years of age (4.7 per 100,000) (Figure 2). Among older individuals, medical comorbidities may increase their risk of TB and may increase the complexity of medical treatment<sup>10, 12, 13</sup>. Thus, along with the estimated growth of the older population<sup>14</sup>, an increased risk of developing co-occurring chronic health conditions is likely<sup>15</sup>.

In 2015, there were 5 cases of TB among children aged 0 to 4 years, with an incidence rate of 0.8 per 100,000 (Figure 2). From 2014 to 2015, the number of cases among children 0-4 years of age decreased from 15 cases to 5 cases. The number of cases among children 5-14 years of age has remained stable over the past 3 years (2013-2015) (Table 1). There was a decrease in the number of pediatric Hispanic cases (children 0-4 years old) from 2014 to 2015 (10 vs 4, respectively; Table 2). However, regardless of this decrease, Hispanic children accounted for 80% of pediatric cases. TB among young children indicates recent transmission<sup>16</sup>, and the need for focused attention on preventing transmission in children.

### Sex Distribution

In 2015, TB in LA County occurred more often among males (352 cases, 58%) compared to females (252 cases, 42%), (Table 1). The TB incidence rate was higher among males (7.4 per 100,000) than females (5.2 per 100,000), (Figure 3). However, there was a 19% increase in female TB cases between 2014 and 2015 (Table 1). 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.

## BIRTHPLACE AND RACE/ETHNICITY

### Place of Birth

In 2015, TB among cases born outside the U.S. (n=491) was almost 4 times higher than among U.S.-born cases (n=110) (Table 1; Figure 4). For the past five years, non U.S.-born persons have accounted for approximately 80% of TB cases (Figure 4). In 2015, cases born outside the U.S. consisted of 287 (58%) males and 204 (42%) females. Among cases born outside the U.S. with a known place of birth, 54% were Asian, 42% Hispanic, 3% non-Hispanic White, and 1% Black (Figure 6). Two-thirds (66%) of TB cases born outside the U.S. were from the following 6 countries: Mexico, Philippines, China, Vietnam, Korea (North and South), and El Salvador (Figure 7). Among U.S.-born TB cases, 45% were Hispanic, 32% Black, 17% non-Hispanic White, and 6% Asian (Figure 6). Table 5 summarizes TB cases born outside the U.S. by race/ethnicity and age.

### Race/Ethnicity

In 2015, Asians (45%) and Hispanics (42%) accounted for 87% of TB cases in LA County (Figure 5; Table 1). The TB incidence rate was highest among Asians (19.6 per 100,000), followed by Blacks and Hispanics (5.5 per 100,000, each), and non-Hispanic Whites (1.2 per 100,000) (Figure 5). TB incidence rates among Asians, Blacks and Hispanics were 16.3 and 4.5 times higher than among non-Hispanic Whites, respectively. Asians represented a greater number of TB cases (n=273) compared to other racial/ethnic groups. Between 2014 and 2015, cases increased by 5.4% among Asians and 4.1% among Hispanics (Table 1).

## MEDICAL AND SOCIAL CHARACTERISTICS

### Medical Comorbidities

In 2015, 39% of adult TB cases had one or more medical comorbidities, including diabetes mellitus, end stage renal disease (ESRD), or another immunosuppressive condition. These comorbidities increase a person's risk of progression from TB infection to active TB disease. Diabetes mellitus (30%; n=177) was the most common comorbidity reported (Table 6). In fact, from 2011 to 2015, diabetes mellitus has been the most common co-occurring medical condition among TB cases, ranging from 28% to 30% (Figure 8).

### HIV Infected Tuberculosis Cases

In 2015, there were 15 (2.8% of cases with known HIV status) TB cases infected with HIV (Table 6; Figure 8). Of the total 604 TB cases, information on HIV status was available for 534 (88%) cases. Among HIV infected TB cases in 2015, 33% were Black and 53% were Hispanic (Table 7). Individuals born outside the U.S. accounted for 67% of HIV infected TB cases. Also, 26% of HIV infected TB cases reported experiencing homelessness in the past year (Table 7).

### Substance Abuse

Recent history substance abuse (defined as within the past year) can be common among TB cases. In 2015, excess alcohol use was the most commonly reported type of substance abuse (10.4%) followed by non-injecting drug use (4.8%) (Table 6; Figure 10). Substance abuse provides special challenges in the treatment and control of TB. People with substance abuse problems are less likely to be screened for TB and less likely to begin and complete treatment for TB infection or TB disease<sup>17</sup>.

## Homelessness

In 2015, 46 (7.5%) TB cases reported experiencing homelessness in the past year (Figure 11). Among TB cases experiencing homelessness, 37% were Black, 50% were Hispanic, 6.5% were Asian, and 6.5% were non-Hispanic white (Table 8). Among homeless TB cases, 91% were male; 50% were born outside the U.S. while 48% were U.S.-born (Table 8). Substance abuse was commonly reported among cases with a recent history of homelessness, with excess alcohol use (41%) being the most commonly reported form of substance abuse, followed by non-injecting drug use (24%), and injected drug use (9%). Tables 9 and 10 present homeless TB cases by demographic characteristics.

## TUBERCULOSIS DISEASE CHARACTERISTICS AND MANAGEMENT

### Site of Disease and Verification Criteria

In 2015, 72% of TB cases were diagnosed with Pulmonary TB only, while 17% were diagnosed with extra-pulmonary TB only, and 11% were diagnosed with both pulmonary and extra-pulmonary TB disease sites (Table 11; Figure 12). Among pulmonary TB cases who were sputum culture positive, 68% (n=269) were sputum smear positive while 32% (n=127) were sputum smear negative (Table 12; Figure 13). In terms of verification criteria, 91% of TB cases confirmed in 2015 were laboratory confirmed cases and 9% were clinically confirmed cases (Table 14). Similarly, for years 2011 to 2014, approximately 80% of LA County TB cases were laboratory confirmed cases.

### Drug Susceptibility Testing

Tables 14-18 summarize the results of drug susceptibility testing (DST). In 2015, there were 520 culture positive TB cases eligible for DST for first-line TB drugs. DST results (excluding multidrug resistance) are presented for the following first-line drugs: rifampin (n=517), isoniazid (n=517), pyrazinamide (n=512), ethambutol (n=517) and streptomycin (n=476). Among cases with DST results, 52 (10%) had resistance to isoniazid, 23 (4.5%) had resistance to pyrazinamide, 1 (0.2%) had resistance to ethambutol and 48 (10%) had resistance to streptomycin. Resistance to these first-line drugs has remained fairly stable over the past 5 years (2011-2015).

Multidrug resistant TB (MDR-TB), defined as having resistance to both isoniazid and rifampin, was identified in 6 (1.2%) TB cases in year 2015 (Table 19). Despite the significant growth of MDR-TB cases in some global regions<sup>18, 19</sup>, in LA County, MDR-TB has remained a small proportion of TB cases, averaging between 1% and 2% of TB cases during 2011-2015. Treatment for TB cases with MDR-TB is often more complex, and requires lengthier (1 ½ to 2 years) and more costly treatment regimens<sup>18-20</sup>.

### Initial Drug Regimen and Type of Therapy Administration

In 2015, 579 cases were alive at diagnosis and started on an initial TB drug regimen (Table 20). The majority of these cases (88%) were started on at least 4 first-line TB drugs (e.g., isoniazid, rifampin, pyrazinamide, ethambutol, streptomycin). Over the past five years, TB cases started on an initial drug regimen consisting of at least 4 first-line TB drugs has increased from 77% to about 90% (Table 20). Information regarding type of therapy administration was available for 577 of TB cases started on an initial drug regimen (Table 21). Among these cases, 55% were on directly observed therapy (DOT), 32% were on a combination of DOT and self-administered therapy (SAT), and 13% were on SAT only (Table 21; Figure 14).

## 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 2013 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 2013, there were 530 TB cases for whom therapy of one year or less was indicated. Among these cases, 491 (93%) completed therapy within 12 months (Table 22). There were also 27 (5%) cases who took longer than 12 months to complete treatment. From 2011 to 2013, the proportion of TB cases completing treatment within 12 months has remained stable at about 90%.

## Mortality in Persons with Tuberculosis

From 2011-2015, there were a total of 359 (11%) deaths among TB cases (Table 23; Figure 15). Among TB cases who died, 79% died during treatment and 21% died before starting treatment.

## GEOGRAPHIC DISTRIBUTION

### LA County: Service Planning Areas

Tables 24 and 25 present demographic characteristics for TB cases by Service Planning Area (SPA) for year 2015. Among the 8 SPAs, 3 SPAs reported the highest number of TB cases in 2015 (Table 24; Figure 16). Specifically, SPA 2: San Fernando Valley reported 131 cases (21.7%), SPA 3: San Gabriel Valley reported 120 cases (19.9%), and SPA 4: Metro reported 100 cases (16.6%).

## 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 all specimens processed (see technical note 3). In 2015, PHL reported results for QFT tests administered at Community Health Services (CHS) Public Health Clinics, HIV Care Clinics, and other Contract Clinics. Out of 23,322 specimens tested, 3,734 tested positive. Among positive QFT tests, 65% were administered at CHS Clinics, 21% at HIV Care Clinics, and 14% at Contract Clinics (Box 3). IGRA tests are an important tool to aid in the diagnosis of TB infection, particularly among patients previously vaccinated with BCG, or patients 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), being born in 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

Box 3. Positive Test Results for QFT Processed at the LA County PHL, by Clinic Type: LA County, 2015*		
Clinic Type	Total*	%
CHS Clinics**	2,427	65.0
HIV Care Clinics***	785	21.0
Contract Clinics	522	14.0
<b>Total tests</b>	<b>3,734</b>	<b>100.0</b>

\*Positive test results only; \*\*CHS=Community Health Services; \*\*\*Ryan White Care Act funded.

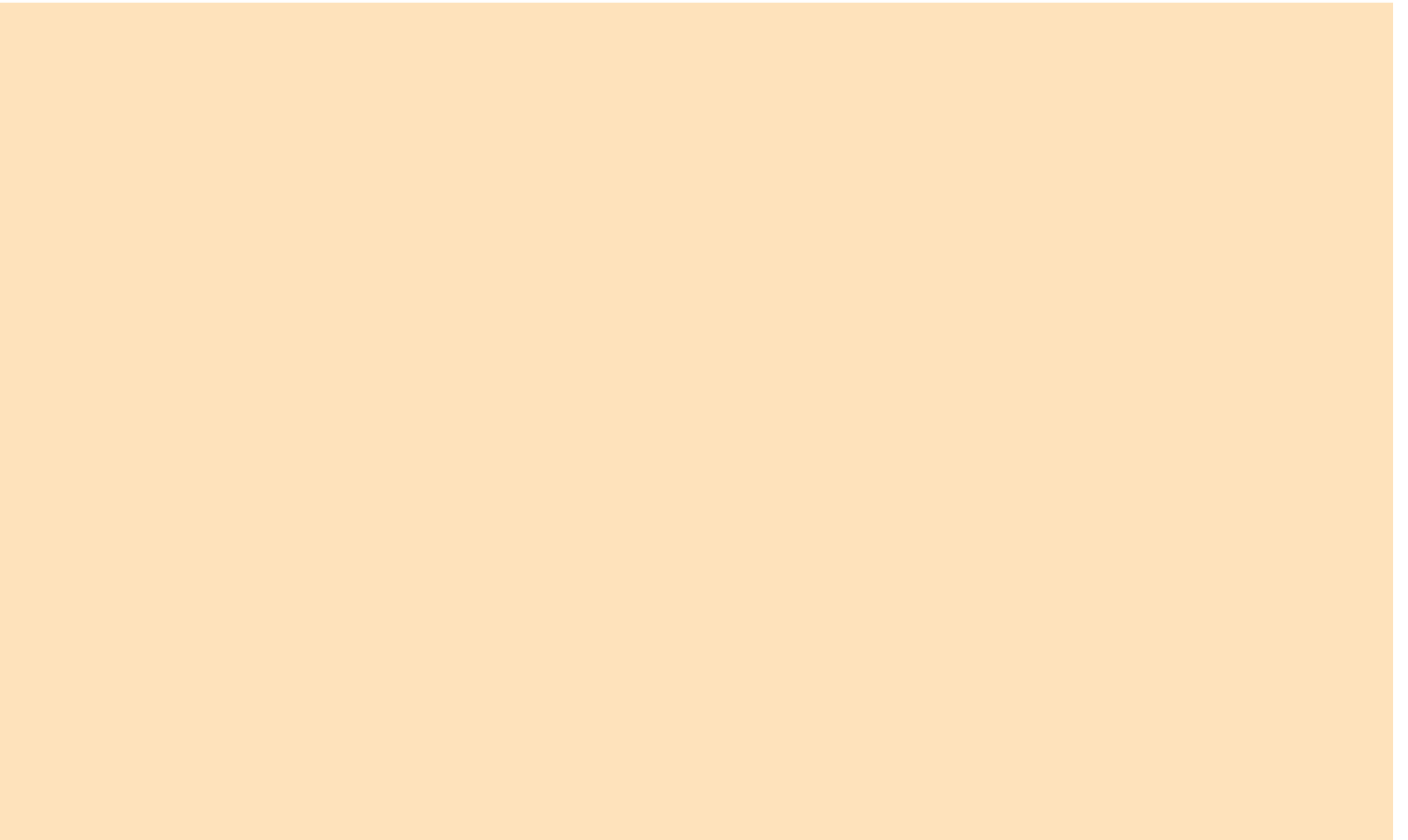
individuals who could be at risk of developing or progressing to TB disease, and thus may be eligible for preventive therapy.

### **TB Notifications**

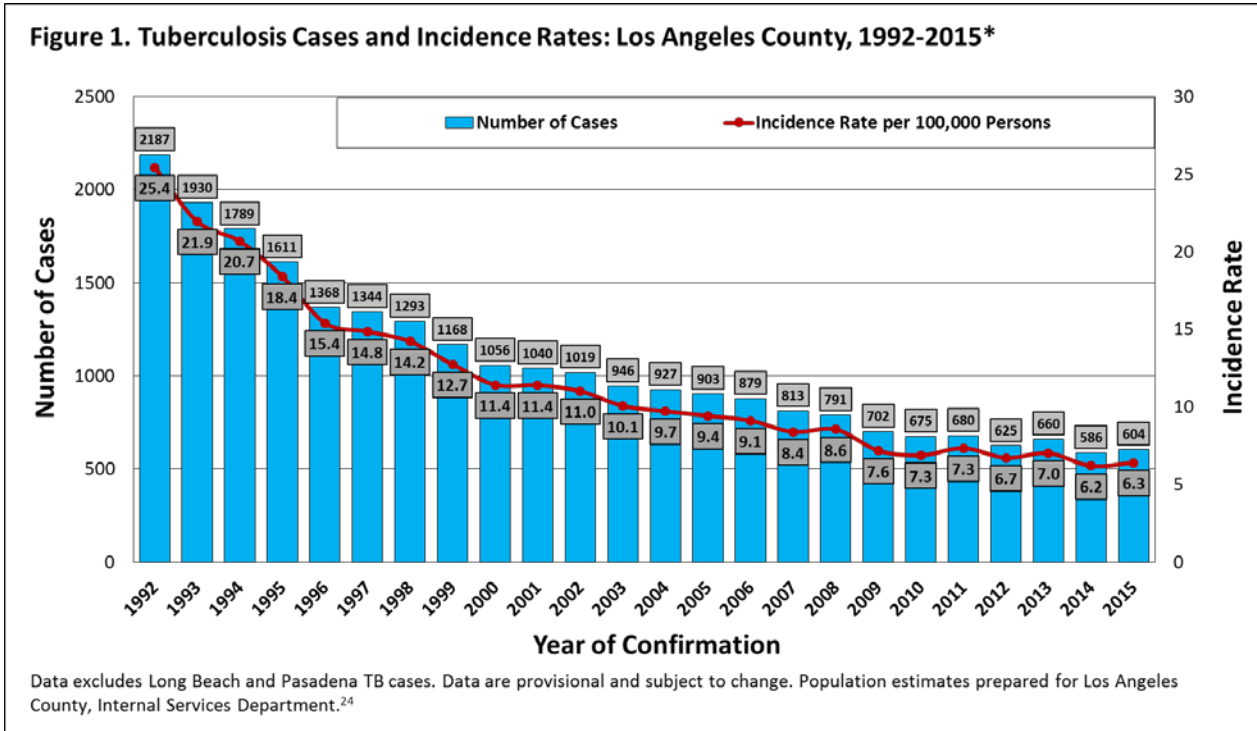
LAC TBCP is also working on the early detection and treatment of TB infection among high-risk individuals born outside the U.S. To achieve this, focus is placed on newly arrived immigrants, refugees, and asylees with a TB notification. TB notifications inform jurisdictions of recent arrivals with a Class 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 CDC guidelines<sup>21</sup>. 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



In 2015, there were 604 confirmed TB cases in LA County, a 3.1% increase from 2014 (586 TB cases). Among California’s 61 health jurisdictions, LA County had the highest number of TB cases and the 10th highest TB incidence rate (6.3 per 100,000 persons).

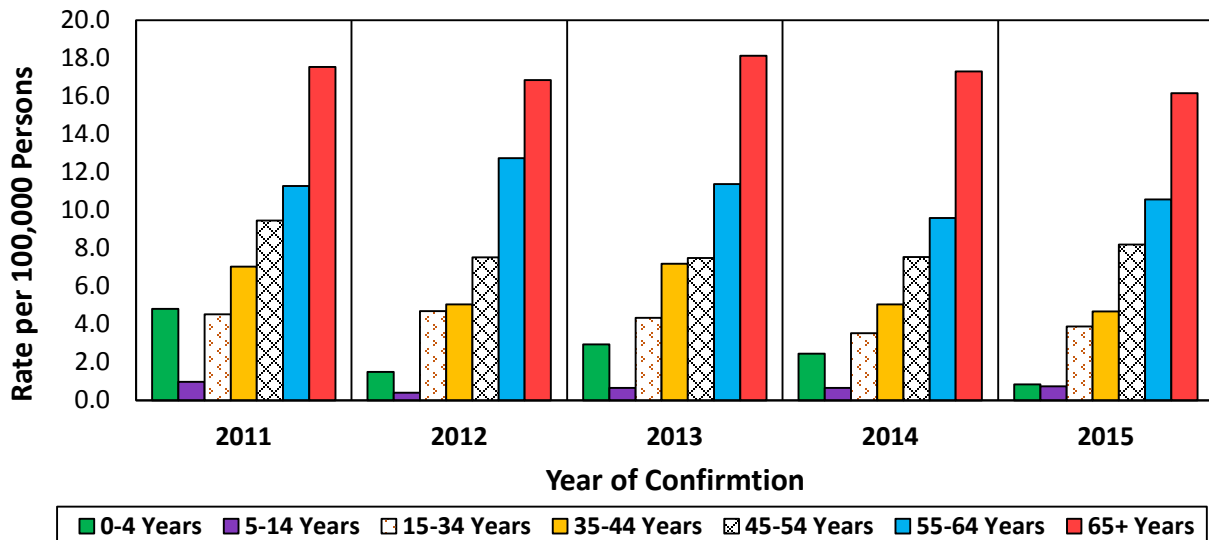


\*Case count data for previous years may differ from previously published data and statistics due to updates in TB case information entered into the TB surveillance database, and thus the counts for previous years presented in this report may not match TB counts previously released (the differences are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

## AGE AND SEX

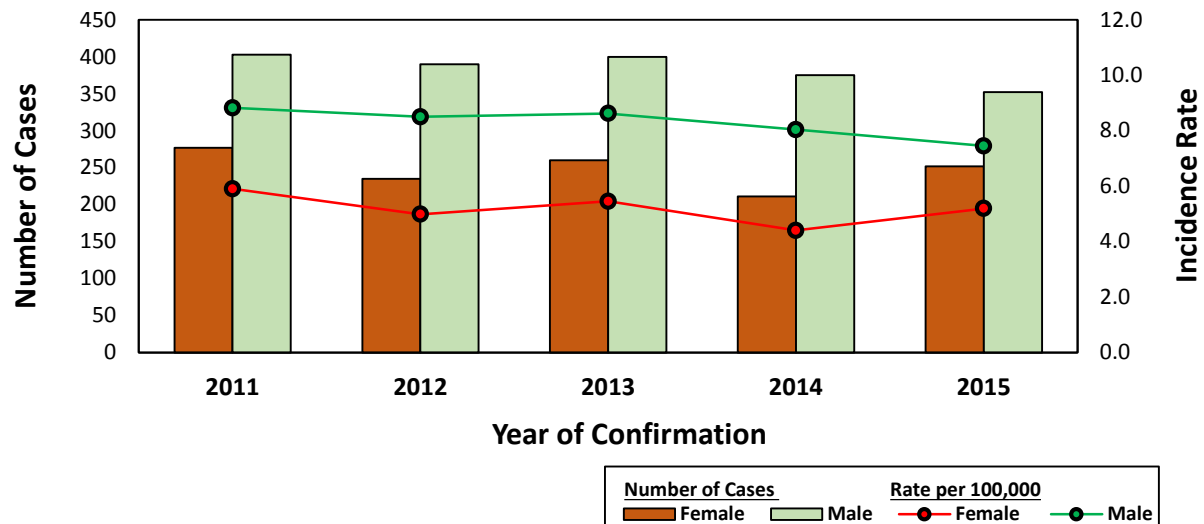
There was a decrease in pediatric TB cases (children 0 to 4 years old) between 2014 and 2015 (2.6% vs. 0.8%, respectively). Older adults continue to represent a large majority of TB cases; adults 65 years of age and older represented 32% of TB cases and had the highest incidence rate of TB (16.3% per 100,000 persons).

**Figure 2: Tuberculosis Incidence Rates by Age Group: Los Angeles County, 2011-2015**



\*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.<sup>24</sup>

**Figure 3: Tuberculosis Cases and Incidence Rates by Sex: Los Angeles, County 2011-2015**



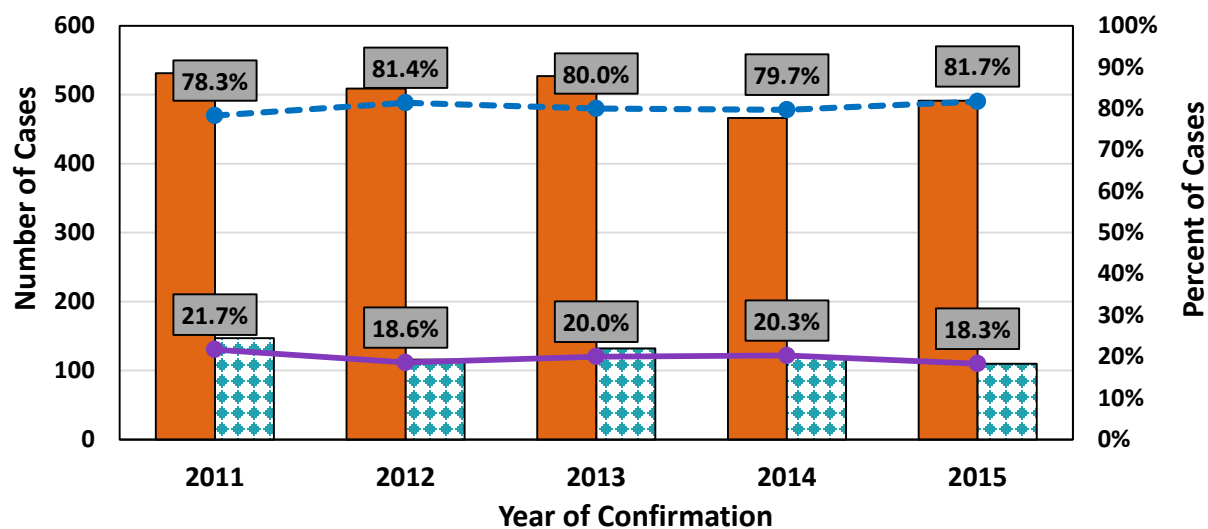
\*Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change. Population estimates prepared for Los Angeles County, Internal Services Department.<sup>24</sup>



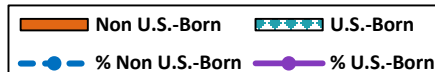
## BIRTHPLACE AND RACE/ETHNICITY

In 2015, there were 4 times the number of TB cases among non U.S.-born individuals (n=491) than among U.S.-born (n=110) individuals. Two-thirds of non U.S.-born TB cases (66%) originated from 6 countries (Mexico, Philippines, China, Vietnam, El Salvador, and Korea).

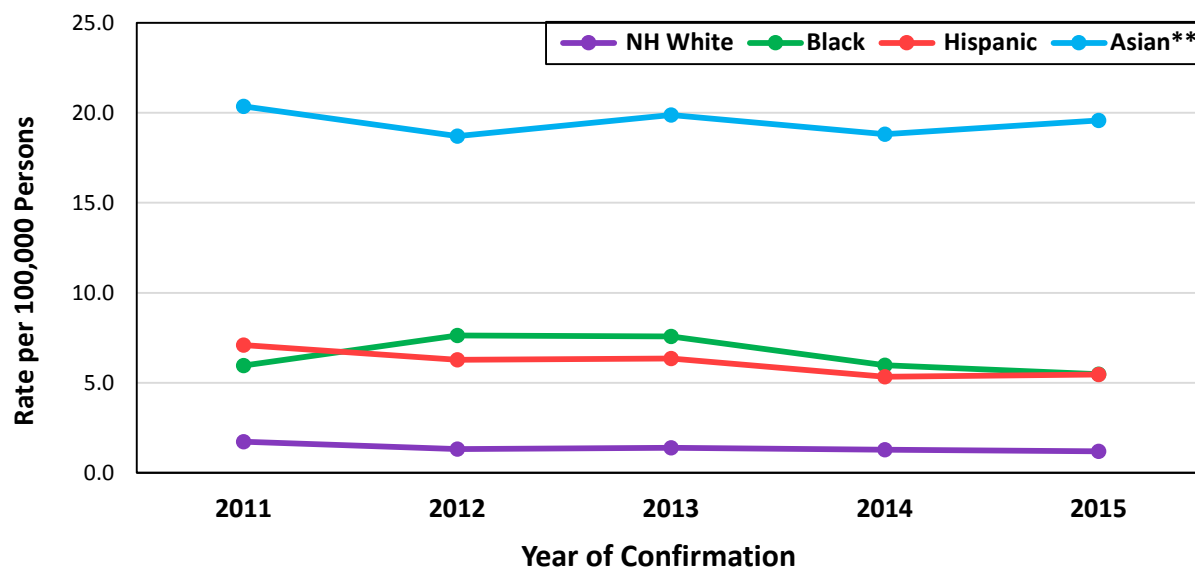
**Figure 4: Tuberculosis Cases by Birthplace: Los Angeles County, 2011-2015**



Data include TB cases with known place of birth. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.



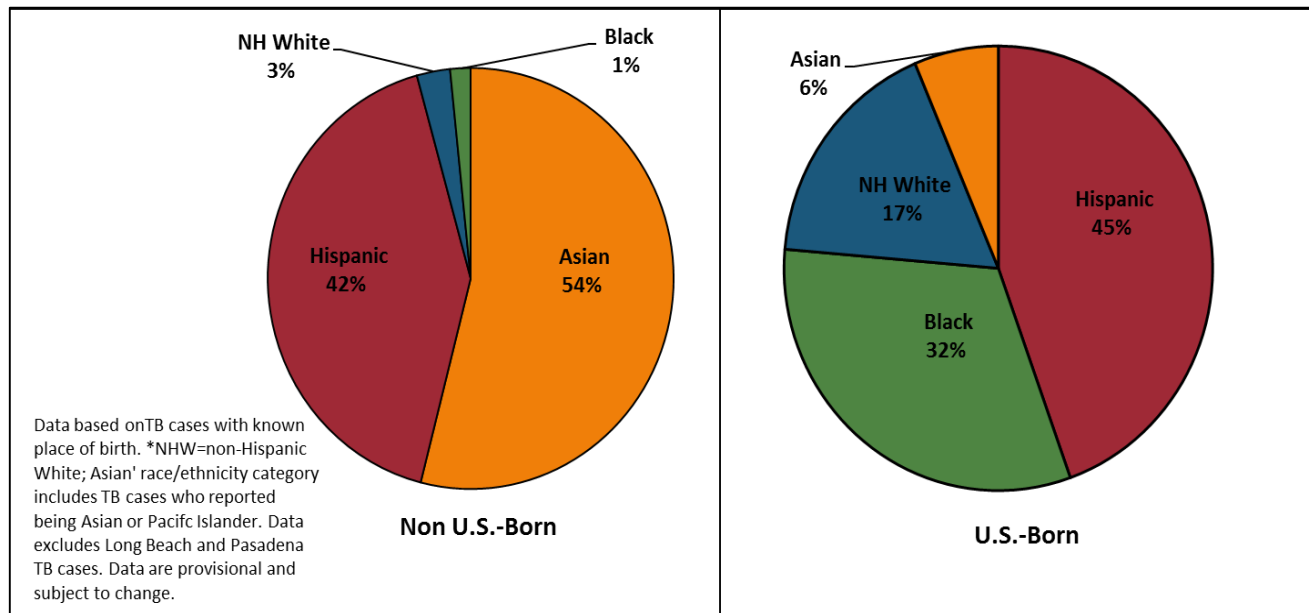
**Figure 5: Tuberculosis Incidence Rates by Race/Ethnicity\*: Los Angeles County, 2011-2015**



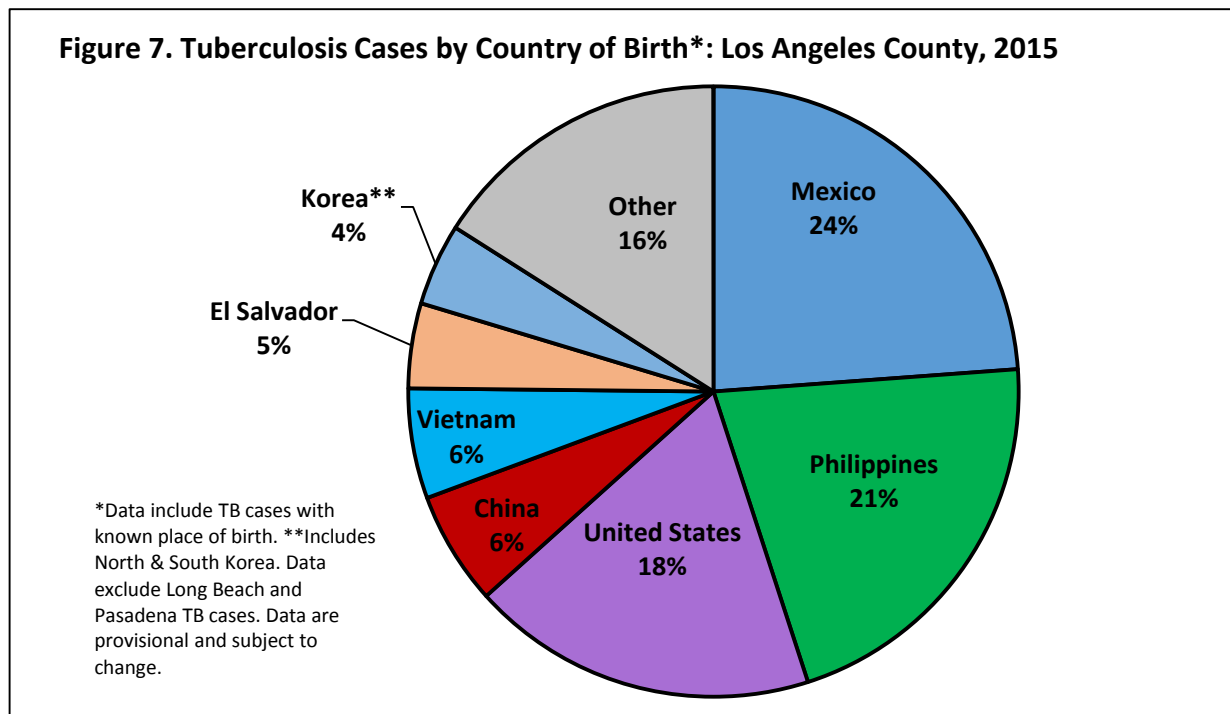
\*Excludes 'Other/unknown' race/ethnicity category due to small cell counts. \*\*'Asian' race/ethnicity category includes TB cases who reported being Asian or Pacific Islander. Data excludes Long Beach and Pasadena TB cases. Data are provisional and subject to change. Population estimates prepared for Los Angeles County, Internal Services Department.<sup>24</sup>

## BIRTHPLACE AND RACE/ETHNICITY

**Figure 6: Tuberculosis Cases by Birthplace and Race/Ethnicity\*: Los Angeles County, 2015**

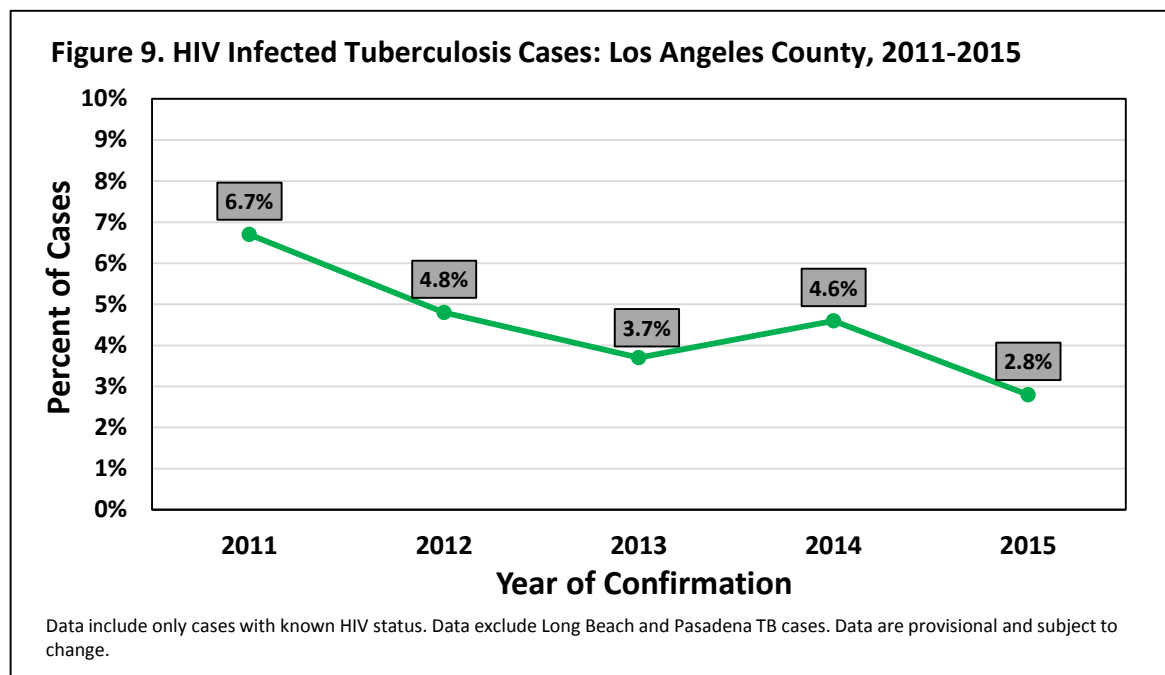
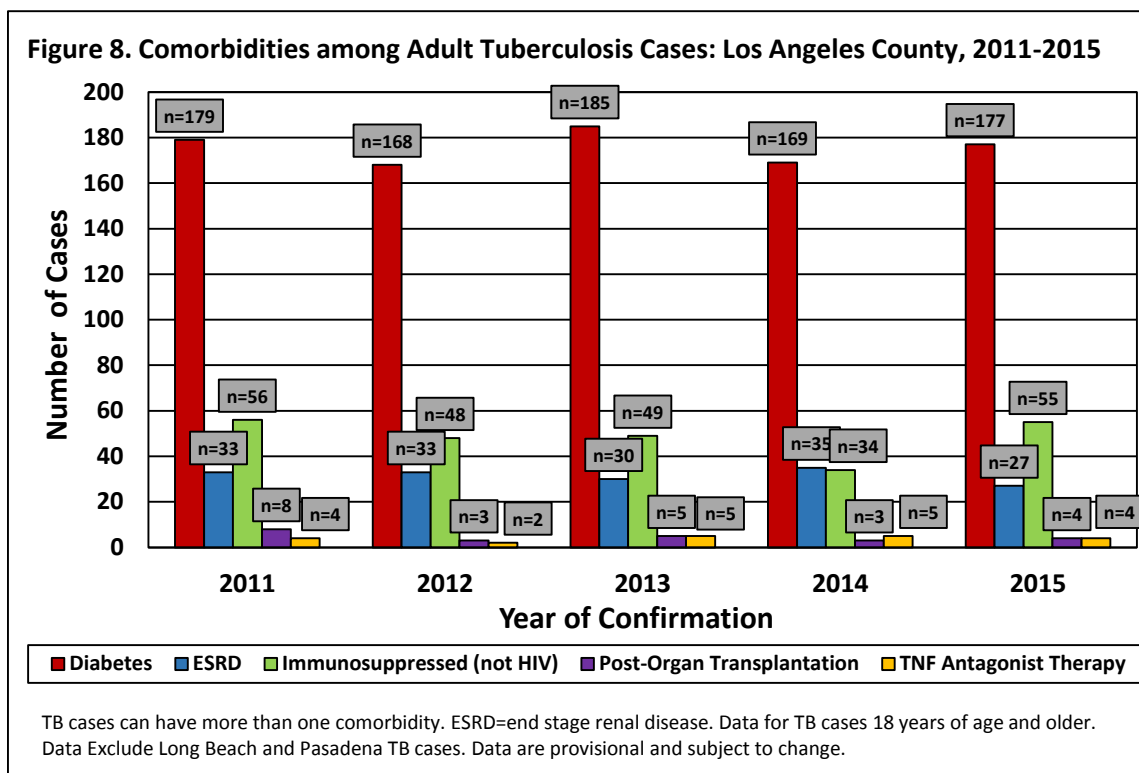


**Figure 7. Tuberculosis Cases by Country of Birth\*: Los Angeles County, 2015**



## MEDICAL AND SOCIAL CHARACTERISTICS

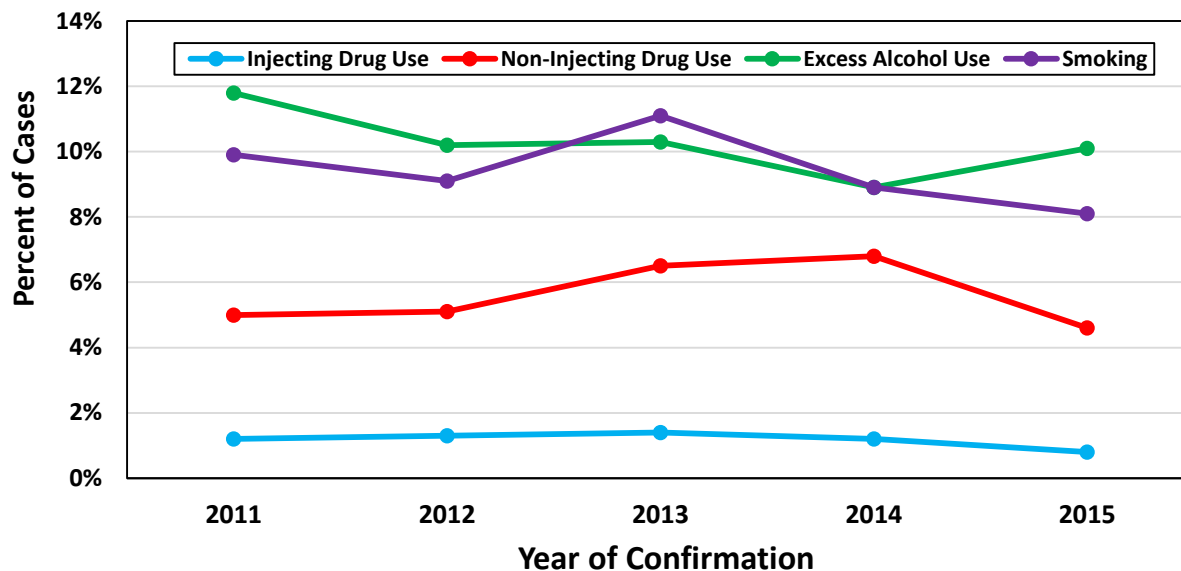
In 2015, 39% (n=234) of adult (18+ years old) TB cases had one or more medical comorbidity, (e.g. diabetes mellitus, ESRD, HIV) with the most common comorbidity being diabetes mellitus (30% of cases). Also, 2.8% (n=15) of TB cases reported in LA County were HIV infected.



## MEDICAL AND SOCIAL CHARACTERISTICS

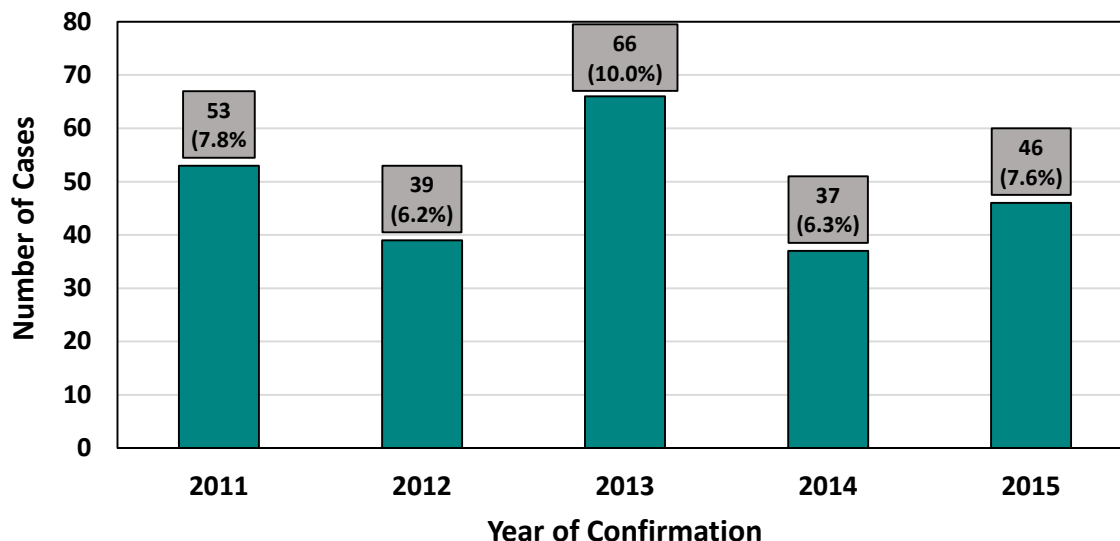
In 2015, excess alcohol use (10%) was the most commonly reported type of substance abuse. In fact, reported excess alcohol use has been commonly reported in the past 5 years. In 2015, 46 (7.5%) TB cases reported experiencing homelessness within the past year.

Figure 10. Reported Substance Use\* among Tuberculosis Cases: Los Angeles County, 2011-2015



\*Drug or alcohol use in the past year. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

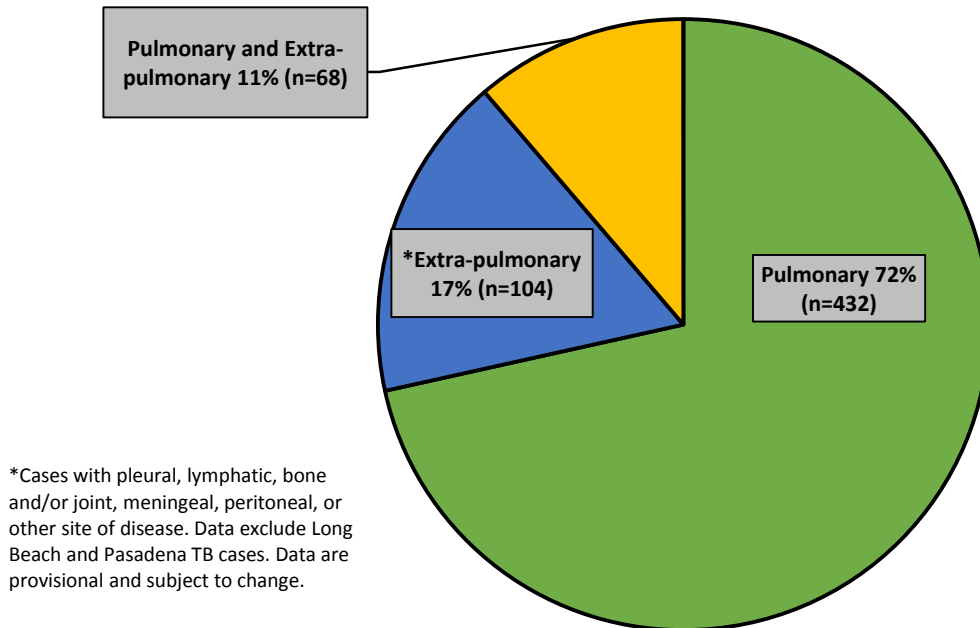
Figure 11. Tuberculosis Cases Experiencing Homelessness\*: Los Angeles County, 2011-2015



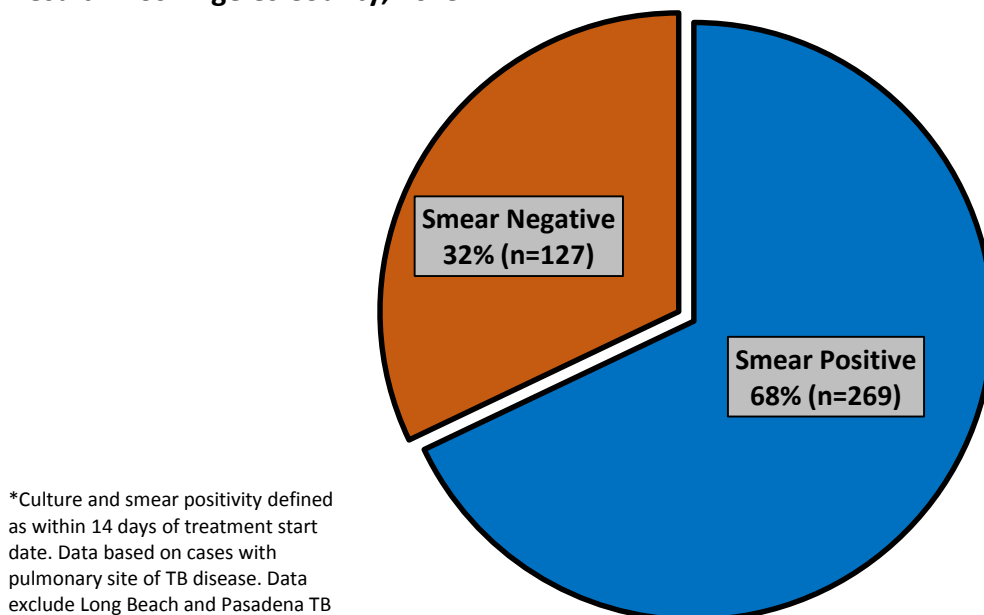
\*Homelessness at any time during the 12 months prior to TB diagnosis. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

## TUBERCULOSIS DISEASE CHARACTERISTICS AND MANAGEMENT

**Figure 12. Tuberculosis Cases by Site of Disease: Los Angeles County, 2015**

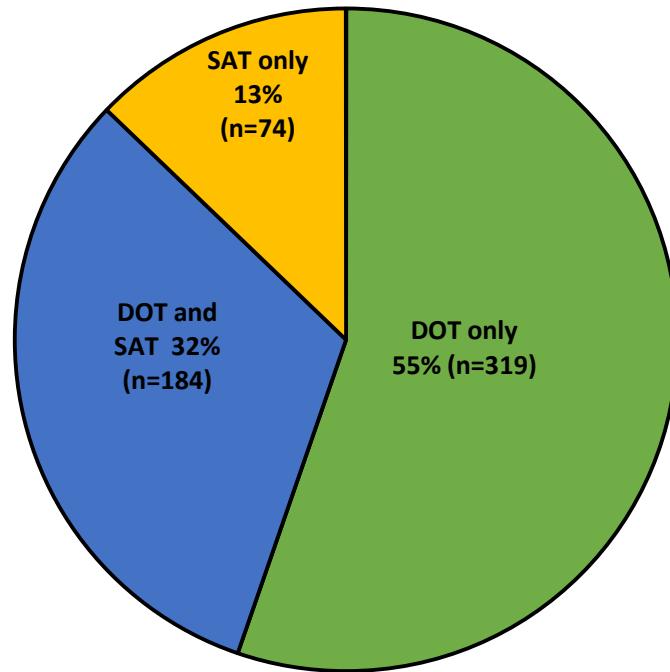


**Figure 13. Pulmonary Culture Confirmed Tuberculosis Cases by Sputum Smear Result\*: Los Angeles County, 2015**



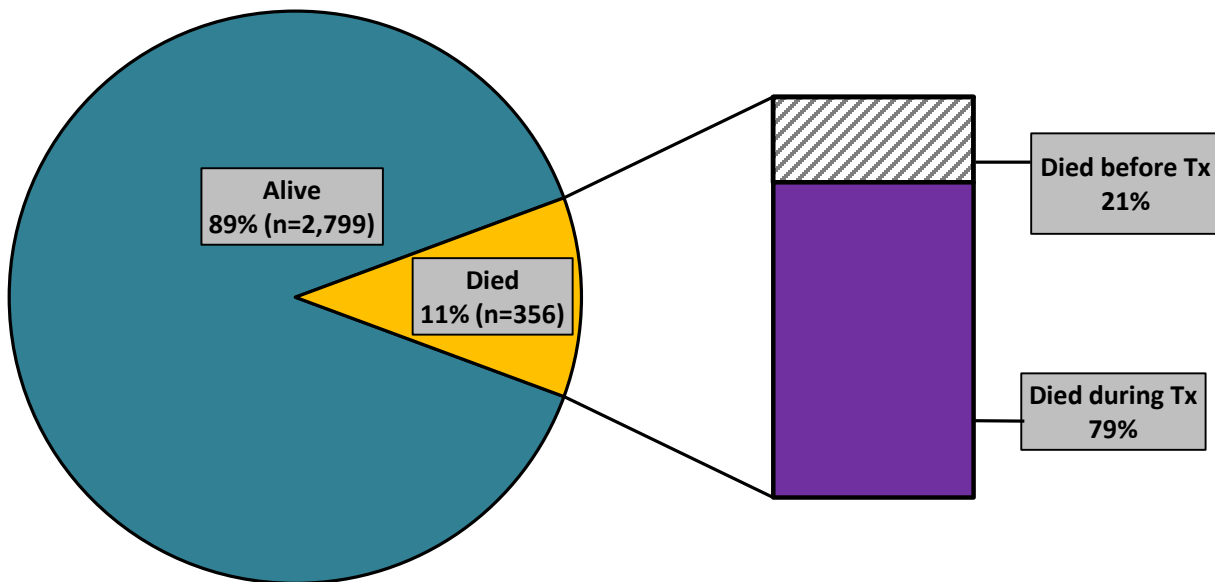
# TUBERCULOSIS DISEASE CHARACTERISTICS AND MANAGEMENT

**Figure 14. Tuberculosis Cases by Type of Therapy Administration: Los Angeles County, 2015\***



\*DOT=Directly observed therapy; SAT=self-administered therapy. Data 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.

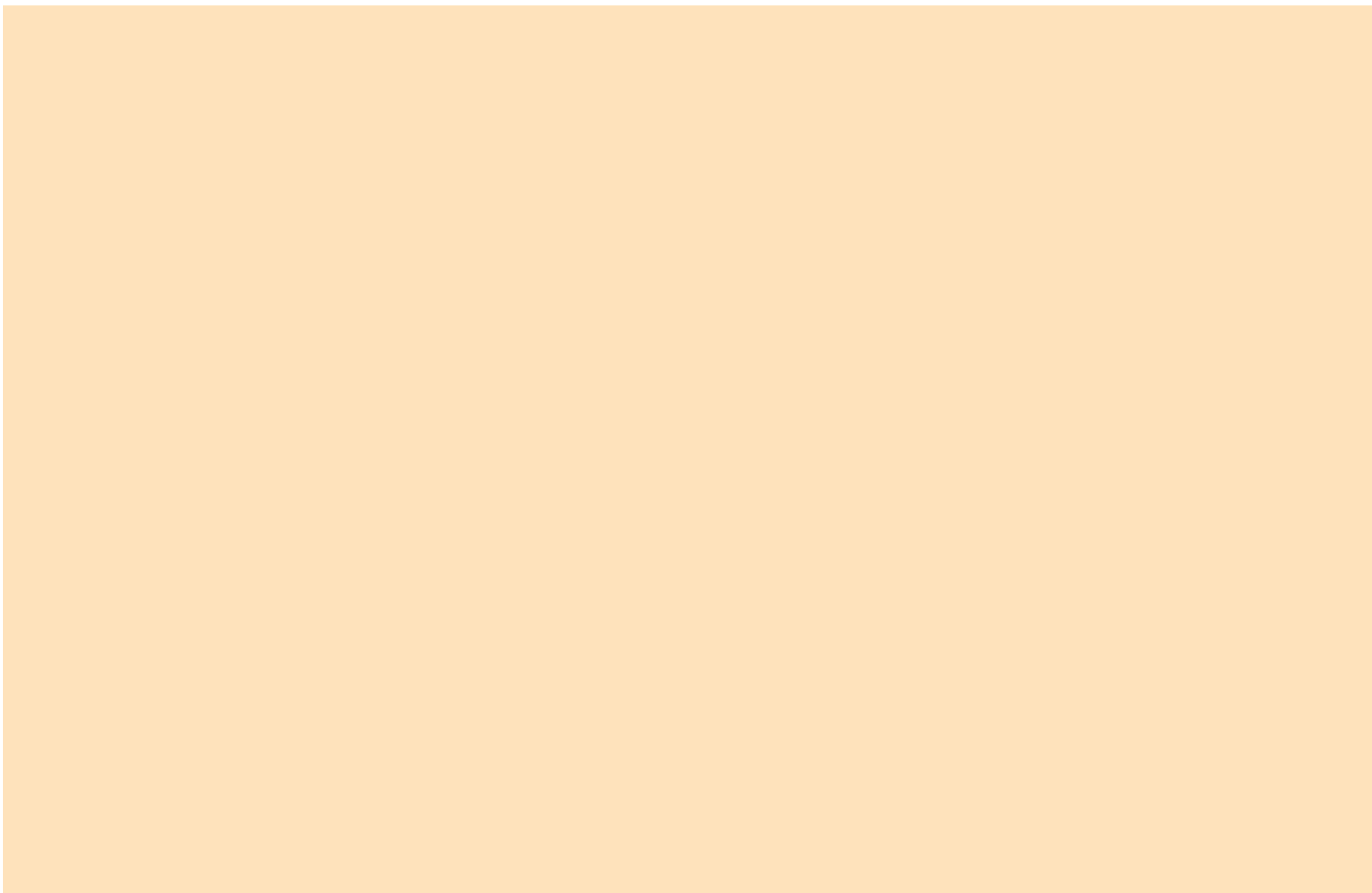
**Figure 15. Mortality among Tuberculosis Cases: Los Angeles County, 2011-2015**



\*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, 2011-2015**

	Year of Confirmation										Percent Change* 2014-2015
	2011		2012		2013		2014		2015		
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	
<b>Race/Ethnicity**</b>											
NH White	46	6.8	35	5.6	37	5.6	34	5.8	32	5.3	-5.9
Black	46	6.8	59	9.4	59	8.9	47	8.0	43	7.1	-8.5
Hispanic	319	46.9	284	45.4	291	44.1	246	42.0	256	42.4	4.1
Asian	268	39.4	247	39.5	272	41.2	259	44.2	273	45.2	5.4
Other	1	0.1	0	0.0	1	0.2	0	0.0	0	0.0	-
<b>Age Group</b>											
0-4	29	4.3	9	1.4	18	2.7	15	2.6	5	1.0	-66.7
5-14	12	1.8	5	0.8	8	1.2	8	1.4	9	1.5	12.5
15-34	126	18.5	130	20.8	123	18.6	100	17.1	110	18.2	10.0
35-44	94	13.8	67	10.7	96	14.5	67	11.4	62	10.0	-7.5
45-54	122	17.9	97	15.5	97	14.7	98	16.7	108	17.9	10.2
55-64	112	16.5	130	20.8	117	17.7	102	17.4	117	19.4	14.7
65+	185	27.2	187	29.9	201	30.5	196	33.4	193	32.0	-1.5
<b>Sex</b>											
Female	277	40.7	235	37.6	260	39.4	211	36.0	252	41.7	19.4
Male	403	59.3	390	62.4	400	60.6	375	64.0	352	58.3	-6.1
<b>Birthplace</b>											
Non U.S.-Born	531	78.1	509	81.4	527	79.8	466	79.5	491	81.3	5.4
U.S.-Born	147	21.6	116	18.6	132	20.0	119	20.3	110	18.2	-7.6
Unknown	2	0.3	0	0.0	1	0.2	1	0.2	3	0.5	-
<b>Country of Birth</b>											
Mexico	166	24.4	169	27.0	152	23.0	127	21.7	143	23.7	12.6
United States	146	21.5	115	18.4	132	20.0	119	20.3	110	18.2	-7.6
Philippines	102	15.0	92	14.7	116	17.6	101	17.2	127	21.0	25.7
China	31	4.6	35	5.6	46	7.0	44	7.5	36	6.0	-18.2
Vietnam	34	5.0	39	6.2	38	5.8	31	5.3	35	5.8	12.9
Korea***	37	5.4	32	5.1	26	3.9	22	3.8	26	4.3	18.2
El Salvador	35	5.1	28	4.5	25	3.8	16	2.7	27	4.5	68.8
Other/unknown	124	19.0	170	18.5	90	18.9	201	21.5	81	16.5	-59.7
<b>Total Cases</b>	<b>680</b>	<b>100.0</b>	<b>625</b>	<b>100.0</b>	<b>660</b>	<b>100.0</b>	<b>586</b>	<b>100.0</b>	<b>604</b>	<b>100.0</b>	<b>3.1</b>

\*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 and 1 unknown for year 2013. \*\*\*Includes both North and South Korea. Data exclude 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, 2011-2015**

	Year of Confirmation									
	2011		2012		2013		2014		2015	
	Cases	%*	Cases	%*	Cases	%*	Cases	%*	Cases	%*
<b>NH White</b>										
0-4	1	2.2	0	0.0	0	0.0	1	2.9	0	0.0
5-14	0	0.0	0	0.0	0	0.0	1	2.9	1	3.1
15-34	1	2.2	3	8.6	2	5.4	3	8.8	4	12.5
35-44	7	15.2	2	5.7	5	13.5	2	5.9	1	3.1
45-54	12	26.1	10	28.6	11	29.7	5	14.7	2	6.3
55-64	5	10.9	5	14.3	8	21.6	7	20.6	7	21.9
65+	20	43.5	15	42.9	11	29.7	15	44.1	17	53.1
<b>Subtotal</b>	<b>46</b>	<b>100.0</b>	<b>35</b>	<b>100.0</b>	<b>37</b>	<b>100.0</b>	<b>34</b>	<b>100.0</b>	<b>32</b>	<b>100.0</b>
<b>Black</b>										
0-4	1	2.2	0	0.0	0	0.0	0	0.0	1	2.3
5-14	1	2.2	1	1.7	0	0.0	1	2.1	0	0.0
15-34	9	19.6	12	20.3	11	18.6	6	12.8	11	25.6
35-44	6	13.0	6	10.2	7	11.9	7	14.9	6	14.0
45-54	11	23.9	10	16.9	15	25.4	9	19.1	8	18.6
55-64	10	21.7	20	33.9	12	20.3	14	29.8	11	25.6
65+	8	17.4	10	16.9	14	23.7	10	21.3	6	14.0
<b>Subtotal</b>	<b>46</b>	<b>100.0</b>	<b>59</b>	<b>100.0</b>	<b>59</b>	<b>100.0</b>	<b>47</b>	<b>100.0</b>	<b>43</b>	<b>100.0</b>
<b>Hispanic</b>										
0-4	23	7.2	7	2.5	17	5.8	10	4.1	4	1.6
5-14	9	2.8	2	0.7	7	2.4	5	2.0	8	3.1
15-34	72	22.6	77	27.1	71	24.4	60	24.4	46	18.0
35-44	45	14.1	41	14.4	51	17.5	40	16.3	32	12.5
45-54	67	21.0	41	14.4	43	14.8	38	15.4	59	23.0
55-64	47	14.7	51	18.0	37	12.7	32	13.0	39	15.2
65+	56	17.6	65	22.9	65	22.3	61	24.8	68	26.6
<b>Subtotal</b>	<b>319</b>	<b>100.0</b>	<b>284</b>	<b>100.0</b>	<b>291</b>	<b>100.0</b>	<b>246</b>	<b>100.0</b>	<b>256</b>	<b>100.0</b>
<b>Asian</b>										
0-4	4	1.5	2	0.8	1	0.4	4	1.5	0	0.0
5-14	2	0.7	2	0.8	1	0.4	1	0.4	0	0.0
15-34	44	16.4	38	15.4	39	14.3	31	12.0	49	17.9
35-44	36	13.4	18	7.3	33	12.1	18	6.9	23	8.4
45-54	32	11.9	36	14.6	27	9.9	46	17.8	39	14.3
55-64	49	18.3	54	21.9	60	22.1	49	18.9	60	22.0
65+	101	37.7	97	39.3	111	40.8	110	42.5	102	37.4
<b>Subtotal</b>	<b>268</b>	<b>100.0</b>	<b>247</b>	<b>100.0</b>	<b>272</b>	<b>100.0</b>	<b>259</b>	<b>100.0</b>	<b>273</b>	<b>100.0</b>
<b>Total Cases</b>	<b>680</b>	<b>100.0</b>	<b>625</b>	<b>100.0</b>	<b>660</b>	<b>100.0</b>	<b>586</b>	<b>100.0</b>	<b>604</b>	<b>100.0</b>

\*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, 2011-2015**

	Year of Confirmation									
	2011		2012		2013		2014		2015	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
<b>NH White</b>										
Female	14	30.4	14	40.0	12	32.4	16	47.1	11	34.4
Male	32	69.6	21	60.0	25	67.6	18	52.9	21	65.6
<b>Subtotal</b>	<b>46</b>	<b>100.0</b>	<b>35</b>	<b>100.0</b>	<b>37</b>	<b>100.0</b>	<b>34</b>	<b>100.0</b>	<b>32</b>	<b>100.0</b>
<b>Black</b>										
Female	17	37.0	22	37.3	20	33.9	13	27.7	19	44.2
Male	29	63.0	37	62.7	39	66.1	34	72.3	24	55.8
<b>Subtotal</b>	<b>46</b>	<b>100.0</b>	<b>59</b>	<b>100.0</b>	<b>59</b>	<b>100.0</b>	<b>47</b>	<b>100.0</b>	<b>43</b>	<b>100.0</b>
<b>Hispanic</b>										
Female	121	37.9	105	37.0	112	38.5	96	39.0	106	41.4
Male	198	62.1	179	63.0	179	61.5	150	61.0	150	58.6
<b>Subtotal</b>	<b>319</b>	<b>100.0</b>	<b>284</b>	<b>100.0</b>	<b>291</b>	<b>100.0</b>	<b>246</b>	<b>100.0</b>	<b>256</b>	<b>100.0</b>
<b>Asian</b>										
Female	125	46.6	94	38.1	116	42.6	86	33.2	116	42.5
Male	143	53.4	153	61.9	156	57.4	173	66.8	157	57.5
<b>Subtotal</b>	<b>268</b>	<b>100.0</b>	<b>247</b>	<b>100.0</b>	<b>272</b>	<b>100.0</b>	<b>259</b>	<b>100.0</b>	<b>273</b>	<b>100.0</b>
<b>Total Cases</b>	<b>680</b>	<b>100.0</b>	<b>625</b>	<b>100.0</b>	<b>660</b>	<b>100.0</b>	<b>586</b>	<b>100.0</b>	<b>604</b>	<b>100.0</b>

\*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, 2015**

	Age Group													
	0-4		5-14		15-34		35-44		45-54		55-64		65+	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
<b>NH White</b>														
Female	0	0.0	0	0.0	2	50.0	1	100.0	0	0.0	1	14.3	7	41.2
Male	0	0.0	1	100.0	2	50.0	0	0.0	2	100.0	6	85.7	10	58.8
<b>Subtotal</b>	<b>0</b>	<b>0.0</b>	<b>1</b>	<b>100.0</b>	<b>4</b>	<b>100.0</b>	<b>1</b>	<b>100.0</b>	<b>2</b>	<b>100.0</b>	<b>7</b>	<b>100.0</b>	<b>17</b>	<b>100.0</b>
<b>Black</b>														
Female	1	0.0	0	0.0	6	54.5	5	83.3	2	25.0	3	27.3	2	33.3
Male	0	0.0	0	0.0	5	45.5	1	16.7	6	75.0	8	72.7	4	66.7
<b>Subtotal</b>	<b>1</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>	<b>11</b>	<b>100.0</b>	<b>6</b>	<b>100.0</b>	<b>8</b>	<b>100.0</b>	<b>11</b>	<b>100.0</b>	<b>6</b>	<b>100.0</b>
<b>Hispanic</b>														
Female	2	50.0	6	75.0	16	34.8	12	37.5	22	37.3	18	46.2	30	44.1
Male	2	50.0	2	25.0	30	65.2	20	62.5	37	62.7	21	53.8	38	55.9
<b>Subtotal</b>	<b>4</b>	<b>100.0</b>	<b>8</b>	<b>100.0</b>	<b>46</b>	<b>100.0</b>	<b>32</b>	<b>100.0</b>	<b>59</b>	<b>100.0</b>	<b>39</b>	<b>100.0</b>	<b>68</b>	<b>100.0</b>
<b>Asian</b>														
Female	0	0.0	0	0.0	29	59.2	10	43.5	17	43.6	21	35.0	39	38.2
Male	0	0.0	0	0.0	20	40.8	13	56.5	22	56.4	39	65.0	63	61.8
<b>Subtotal</b>	<b>0</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>	<b>49</b>	<b>100.0</b>	<b>23</b>	<b>100.0</b>	<b>39</b>	<b>100.0</b>	<b>60</b>	<b>100.0</b>	<b>102</b>	<b>100.0</b>
<b>Total Cases</b>	<b>5</b>	<b>100.0</b>	<b>9</b>	<b>100.0</b>	<b>110</b>	<b>100.0</b>	<b>62</b>	<b>100.0</b>	<b>108</b>	<b>100.0</b>	<b>117</b>	<b>100.0</b>	<b>193</b>	<b>100.0</b>

\*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, 2011-2015**

	Year of Confirmation									
	2011		2012		2013		2014		2015	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
<b>NH White</b>										
0-4	1	4.8	0	0.0	0	0.0	0	0.0	0	0.0
5-14	0	0.0	0	0.0	0	0.0	1	5.9	0	0.0
15-34	0	0.0	1	5.9	1	5.9	1	5.9	2	15.4
35-44	2	9.5	2	11.8	2	11.8	1	5.9	0	0.0
45-54	5	23.8	3	17.6	5	29.4	3	17.6	1	7.7
55-64	1	4.8	2	11.8	1	5.9	10	58.8	1	7.7
65+	12	57.1	9	52.9	8	47.1	16	94.1	9	69.2
<b>Subtotal</b>	<b>21</b>	<b>100.0</b>	<b>17</b>	<b>100.0</b>	<b>17</b>	<b>100.0</b>	<b>17</b>	<b>100.0</b>	<b>13</b>	<b>100.0</b>
<b>Black</b>										
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	1	9.1	0	0.0
15-34	4	44.4	6	35.3	5	38.5	4	36.4	3	37.5
35-44	1	11.1	4	23.5	4	30.8	1	9.1	2	25.0
45-54	2	22.2	1	5.9	2	15.4	1	9.1	0	0.0
55-64	2	22.2	3	17.6	1	7.7	1	9.1	1	12.5
65+	0	0.0	3	17.6	1	7.7	3	27.3	2	25.0
<b>Subtotal</b>	<b>9</b>	<b>100.0</b>	<b>17</b>	<b>100.0</b>	<b>13</b>	<b>100.0</b>	<b>11</b>	<b>100.0</b>	<b>8</b>	<b>100.0</b>
<b>Hispanic</b>										
0-4	2	0.8	0	0.0	2	0.9	0	0.0	0	0.0
5-14	0	0.0	0	0.0	3	1.3	0	0.0	1	0.5
15-34	54	22.1	58	24.6	48	21.0	33	17.6	24	11.7
35-44	39	16.0	34	14.4	44	19.2	34	18.2	30	14.6
45-54	58	23.8	39	16.5	34	14.8	34	18.2	54	26.3
55-64	42	17.2	48	20.3	36	15.7	30	16.0	35	17.1
65+	49	20.1	57	24.2	62	27.1	56	29.9	61	29.8
<b>Subtotal</b>	<b>2</b>	<b>100.0</b>	<b>236</b>	<b>100.0</b>	<b>229</b>	<b>100.0</b>	<b>187</b>	<b>100.0</b>	<b>205</b>	<b>100.0</b>
<b>Asian</b>										
0-4	0	0.0	0	0.0	0	0.0	1	0.4	0	0.0
5-14	1	0.4	2	0.8	0	0.0	1	0.4	0	0.0
15-34	41	16.0	32	13.4	38	14.2	30	11.9	44	16.6
35-44	36	14.0	18	7.5	33	12.4	17	6.7	22	8.3
45-54	32	12.5	36	15.1	27	10.1	46	18.3	38	14.3
55-64	49	19.1	54	22.6	60	22.5	48	19.0	59	22.3
65+	98	38.1	97	40.6	109	40.8	109	43.3	102	38.5
<b>Subtotal</b>	<b>257</b>	<b>100.0</b>	<b>239</b>	<b>100.0</b>	<b>267</b>	<b>100.0</b>	<b>252</b>	<b>100.0</b>	<b>265</b>	<b>100.0</b>
<b>Total Cases</b>	<b>531</b>	<b>100.0</b>	<b>509</b>	<b>100.0</b>	<b>527</b>	<b>100.0</b>	<b>466</b>	<b>100.0</b>	<b>491</b>	<b>100.0</b>

\*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 Abuse\*\*: Los Angeles County, 2011-2015**

	Year of Confirmation									
	2011		2012		2013		2014		2015	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
<b>Diabetes</b>	179	28.3	168	28.0	185	29.6	169	30.1	177	30.1
<b>ESRD</b>	33	5.2	33	5.5	30	4.8	35	6.2	27	4.6
<b>Immunosuppressed (not HIV)</b>	56	8.9	48	8.0	49	7.8	34	6.0	55	9.3
<b>HIV Positive</b>	41	6.7	28	4.8	22	3.7	24	4.6	15	2.8
<b>Post-Organ Transplantation</b>	8	1.3	3	0.5	5	0.8	3	0.5	4	0.7
<b>TNF Antagonist Therapy</b>	4	0.6	2	0.3	5	0.8	5	0.9	4	0.7
<b>Injecting Drug Use</b>	8	1.3	8	1.3	9	1.4	7	1.2	5	0.8
<b>Non-Injecting Drug Use</b>	33	5.2	32	5.3	43	6.9	40	7.1	28	4.8
<b>Excess Alcohol Use</b>	80	12.7	64	10.7	68	10.9	52	9.3	61	10.4

\*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, 2011-2015**

	Year of Confirmation									
	2011		2012		2013		2014		2015	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
<b>Race/Ethnicity*</b>										
NH White	3	7.3	0	0.0	4	18.2	1	4.2	1	6.7
Black	10	24.4	6	21.4	6	27.3	9	37.5	5	33.3
Hispanic	27	65.9	19	67.9	11	50.0	11	45.8	8	53.3
Asian	1	2.4	3	10.7	1	4.5	3	12.5	1	6.7
<b>Age Group**</b>										
15-34	10	24.4	3	10.7	5	22.7	4	16.7	4	26.7
35-44	9	22.0	10	35.7	6	27.3	9	37.5	2	13.3
45-54	17	41.5	6	21.4	6	27.3	7	29.2	7	46.7
55-64	5	12.2	7	25.0	3	13.6	3	12.5	2	13.3
65+	0	0.0	2	7.10	2	9.1	1	4.2	0	0.0
<b>Sex</b>										
Female	6	14.6	3	10.7	5	22.7	3	12.5	3	20.0
Male	35	85.4	25	89.3	17	77.3	21	87.5	12	80.0
<b>Place of Birth</b>										
Non U.S.-Born	30	73.2	20	71.4	13	59.1	10	41.7	10	66.7
U.S.-Born	11	26.8	8	28.6	9	40.9	14	58.3	5	33.3
<b>Injecting Drug Use***</b>										
Yes	1	2.4	0	0.0	2	9.1	2	8.3	1	6.7
No	37	90.2	25	89.3	19	86.4	22	91.7	14	93.3
Unknown	3	7.3	3	10.7	1	4.5	0	0.0	0	0.0
<b>Non-Injecting Drug Use***</b>										
Yes	8	19.5	6	21.4	3	13.6	10	41.7	3	20.0
No	30	73.2	21	75.0	18	81.8	14	58.3	12	80.0
Unknown	3	7.3	1	3.6	1	4.5	0	0.0	0	0.0
<b>Excess Alcohol Use***</b>										
Yes	14	34.1	6	21.4	3	13.6	4	16.7	4	26.7
No	24	58.5	21	75.0	18	81.8	20	83.3	11	73.3
Unknown	3	7.3	1	3.6	1	4.5	0	0.0	0	0.0
<b>Homelessness***</b>										
Yes	14	34.1	6	21.4	3	13.6	4	16.7	4	26.7
No	24	58.5	21	75.0	18	81.8	20	83.3	11	73.3
Unknown	3	7.3	1	3.6	1	4.5	0	0.0	0	0.0
<b>Total</b>	<b>41</b>	<b>100.0</b>	<b>28</b>	<b>100.0</b>	<b>22</b>	<b>100.0</b>	<b>24</b>	<b>100.0</b>	<b>15</b>	<b>100.0</b>

\*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, 2011-2015**

	Year of Confirmation									
	2011		2012		2013		2014		2015	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
<b>Race/Ethnicity**</b>										
NH White	3	5.7	2	5.1	6	9.1	5	13.5	3	6.5
Black	16	30.2	13	33.3	23	34.8	14	37.8	17	37.0
Hispanic	30	56.6	21	53.8	34	51.5	11	29.7	23	50.0
Asian	4	7.5	3	7.7	3	4.5	7	18.9	3	6.5
<b>Age Group***</b>										
15-34	8	15.1	8	20.5	8	12.1	5	13.5	8	17.4
35-44	15	28.3	9	23.1	17	25.8	4	10.8	9	19.6
45-54	12	22.6	8	20.5	24	36.4	12	32.4	13	28.3
55-64	15	28.3	13	33.3	10	15.2	9	24.3	8	17.4
65+	3	5.7	1	2.6	7	10.6	7	18.9	8	17.4
<b>Sex</b>										
Female	7	13.2	4	10.3	8	12.1	3	8.1	4	8.7
Male	46	86.8	35	89.7	58	87.9	34	91.9	42	91.3
<b>Birthplace</b>										
Non U.S.-Born	26	49.1	18	46.2	30	45.5	16	43.2	23	50.0
U.S.-Born	27	50.9	21	53.8	35	53.0	20	54.1	22	47.8
Unknown	0	0.0	0	0.0	1	1.5	1	2.7	1	2.2
<b>Injecting Drug Use*</b>										
Yes	4	7.5	3	7.7	4	6.1	1	2.7	4	8.7
No	44	83.0	33	84.6	57	86.4	31	83.8	37	80.4
Unknown	5	9.4	3	7.7	5	7.6	5	13.5	5	10.9
<b>Non-Injecting Drug Use*</b>										
Yes	16	30.2	12	30.8	19	28.8	13	35.1	11	23.9
No	32	60.4	23	59.0	42	63.6	20	54.1	30	65.2
Unknown	5	9.4	4	10.3	5	7.6	4	10.8	5	10.9
<b>Excess Alcohol Use*</b>										
Yes	25	47.2	19	48.7	36	54.5	16	43.2	19	41.3
No	24	45.3	17	43.6	28	42.4	17	45.9	24	52.2
Unknown	4	7.5	3	7.7	2	3.0	4	10.8	3	6.5
<b>Total</b>	<b>53</b>	<b>100.0</b>	<b>39</b>	<b>100.0</b>	<b>66</b>	<b>100.0</b>	<b>37</b>	<b>100.0</b>	<b>46</b>	<b>100.0</b>

\*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 under the age of 15 experiencing homelessness. 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, 2011-2015**

	Year of Confirmation									
	2011		2012		2013		2014		2015	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
<b>NH White</b>										
Female	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Male	3	100.0	2	100.0	6	100.0	5	100.0	3	100.0
<b>Subtotal</b>	<b>3</b>	<b>100.0</b>	<b>2</b>	<b>100.0</b>	<b>6</b>	<b>100.0</b>	<b>5</b>	<b>100.0</b>	<b>3</b>	<b>100.0</b>
<b>Black</b>										
Female	3	18.8	1	7.7	2	8.7	2	14.3	2	11.8
Male	13	81.3	12	92.3	21	91.3	12	85.7	15	88.2
<b>Subtotal</b>	<b>16</b>	<b>100.0</b>	<b>13</b>	<b>100.0</b>	<b>23</b>	<b>100.0</b>	<b>14</b>	<b>100.0</b>	<b>17</b>	<b>100.0</b>
<b>Hispanic</b>										
Female	3	10.0	3	14.3	5	14.7	0	0.0	2	8.7
Male	27	90.0	18	85.7	29	85.3	11	100.0	21	91.3
<b>Subtotal</b>	<b>30</b>	<b>100.0</b>	<b>21</b>	<b>100.0</b>	<b>34</b>	<b>100.0</b>	<b>11</b>	<b>100.0</b>	<b>23</b>	<b>100.0</b>
<b>Asian</b>										
Female	1	25.0	0	0.0	1	33.3	1	14.3	0	0.0
Male	3	75.0	3	100.0	2	66.7	6	85.7	3	100.0
<b>Subtotal</b>	<b>4</b>	<b>100.0</b>	<b>3</b>	<b>100.0</b>	<b>3</b>	<b>100.0</b>	<b>7</b>	<b>100.0</b>	<b>3</b>	<b>100.0</b>
<b>Total Cases</b>	<b>53</b>	<b>100.0</b>	<b>39</b>	<b>100.0</b>	<b>66</b>	<b>100.0</b>	<b>37</b>	<b>100.0</b>	<b>46</b>	<b>100.0</b>

\*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 Place of Birth: Los Angeles County, 2011-2015**

	Year of Confirmation									
	2011		2012		2013		2014		2015	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
<b>NH White</b>										
Non U.S.-Born	0	0.0	0	0.0	0	0.0	1	2.7	1	2.2
U.S.-Born	3	5.7	2	5.1	6	9.1	4	10.8	2	4.3
<b>Subtotal</b>	<b>3</b>	<b>5.7</b>	<b>2</b>	<b>5.1</b>	<b>6</b>	<b>9.1</b>	<b>5</b>	<b>13.5</b>	<b>3</b>	<b>6.5</b>
<b>Black</b>										
Non U.S.-Born	0	0.0	0	0.0	1	1.5	0	0.0	0	0.0
U.S.-Born	16	30.2	13	33.3	21	31.8	14	37.8	17	37.0
Unknown	0	0.0	0	0.0	1	1.5	0	0.0	0	0.0
<b>Subtotal</b>	<b>16</b>	<b>30.2</b>	<b>13</b>	<b>33.3</b>	<b>23</b>	<b>34.8</b>	<b>14</b>	<b>37.8</b>	<b>17</b>	<b>37.0</b>
<b>Hispanic</b>										
Non U.S.-Born	22	41.5	15	38.5	26	39.4	8	21.6	19	41.3
U.S.-Born	8	15.1	6	15.4	8	12.1	2	5.4	3	6.5
Unknown	0	0.0	0	0.0	0	0.0	1	2.7	1	2.2
<b>Subtotal</b>	<b>30</b>	<b>56.6</b>	<b>21</b>	<b>53.8</b>	<b>34</b>	<b>51.5</b>	<b>11</b>	<b>29.7</b>	<b>23</b>	<b>50.0</b>
<b>Asian</b>										
Non U.S.-Born	4	7.5	3	7.7	3	4.5	7	18.9	3	6.5
U.S.-Born	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
<b>Subtotal</b>	<b>4</b>	<b>7.5</b>	<b>3</b>	<b>7.7</b>	<b>3</b>	<b>4.5</b>	<b>7</b>	<b>18.9</b>	<b>3</b>	<b>6.5</b>
<b>Total Cases</b>	<b>53</b>	<b>100.0</b>	<b>39</b>	<b>100.0</b>	<b>66</b>	<b>100.0</b>	<b>37</b>	<b>100.0</b>	<b>46</b>	<b>100.0</b>

\*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 11. Tuberculosis Cases by Site of TB Disease: Los Angeles County, 2011-2015**

	Year of Confirmation									
	2011		2012		2013		2014		2015	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
<b>Pulmonary</b>	470	69.1	405	64.8	455	68.9	391	66.7	432	71.5
<b>Extra-pulmonary*</b>	135	19.9	147	23.5	127	19.2	132	22.5	104	17.2
<b>Both Pulmonary and Extra-pulmonary</b>	75	11.0	73	11.7	78	11.8	63	10.8	68	11.3
<b>Total Cases</b>	680	100.0	625	100.0	660	100.0	586	100.0	604	100.0

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

**Table 12. Tuberculosis Cases with known Sputum Culture and Sputum Smear Positivity\*: Los Angeles County, 2011-2015**

		Year of Confirmation									
		2011		2012		2013		2014		2015	
		Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
<b>Sputum Culture Positive</b>	<b>Sputum Smear Positive</b>										
	No	78	90.7	66	94.3	67	89.3	53	77.9	53	86.9
	Yes	8	9.3	4	5.7	8	10.7	15	22.1	8	13.1
<b>Subtotal</b>		86	100.0	70	100.0	75	100.0	68	100.0	61	100.0
No	<b>Sputum Smear Positive</b>										
	No	128	30.9	105	28.3	125	30.6	99	27.7	127	32.1
	Yes	286	69.1	266	71.7	283	69.4	259	72.3	269	67.9
<b>Subtotal</b>		414	100.0	371	100.0	408	100.0	358	100.0	396	100.0
<b>Total Cases</b>		500	100.0	441	100.0	483	100.0	426	100.0	457	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 13. Tuberculosis Cases by Verification Criteria\*: Los Angeles County, 2011-2015**

	Year of Confirmation									
	2011		2012		2013		2014		2015	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
<b>Laboratory Confirmation*</b>	565	83.1	532	85.1	555	84.1	510	87.0	550	91.1
<b>Clinical Confirmation</b>										
<b>Clinical Case</b>	89	13.1	81	13.0	88	13.3	66	11.3	40	6.6
<b>Provider Diagnosis</b>	26	3.8	12	1.9	17	2.6	10	1.7	14	2.3
<b>Total Cases</b>	680	100.0	625	100.0	660	100.0	586	100.0	604	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 14. Tuberculosis Cases with Resistance to Rifampin: Los Angeles County, 2011-2015**

Year of Confirmation	Culture Positive Cases	No. with RIF Susceptibility Testing	Cases with Resistance to RIF*	
			Cases	%
2011	547	540	0	0.0
2012	511	503	2	0.4
2013	535	530	1	0.2
2014	476	473	3	0.6
2015	520	517	0	0.0

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

**Table 15. Tuberculosis Cases with Resistance to Isoniazid: Los Angeles County, 2011-2015**

Year of Confirmation	Culture Positive Cases	No. with INH Susceptibility Testing	Cases with Resistance to INH*	
			Cases	%
2011	547	540	36	6.7
2012	511	503	30	6.0
2013	535	530	48	9.1
2014	476	473	46	9.7
2015	520	517	52	10.1

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

**Table 16. Tuberculosis Cases by Resistance with Pyrazinamide: Los Angeles County, 2011-2015**

Year of Confirmation	Culture Positive Cases	No. with PZA Susceptibility Testing	Cases with Resistance to PZA*	
			Cases	%
2011	547	539	38	7.1
2012	511	501	26	5.2
2013	535	528	34	6.4
2014	476	474	21	4.4
2015	520	512	23	4.5

\*PZA=Pyrazinamide; 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 Ethambutol: Los Angeles County, 2011-2015**

Year of Confirmation	Culture Positive Cases	No. with EMB Susceptibility Testing	Cases with Resistance to EMB*	
			Cases	%
2011	547	540	5	0.9
2012	511	504	3	0.6
2013	535	530	3	0.6
2014	476	472	0	0.0
2015	520	517	1	0.2

\*EMB=Ethambutol; 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 Streptomycin: Los Angeles County, 2011-2015**

Year of Confirmation	Culture Positive Cases	No. with SM Susceptibility Testing	Cases with Resistance to SM*	
			Cases	%
2011	547	514	44	8.6
2012	511	486	40	8.2
2013	535	508	45	8.9
2014	476	445	28	6.3
2015	520	476	48	10.1

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

**Table 19. Tuberculosis Cases with Multidrug Resistance: Los Angeles County, 2011-2015**

Year of Confirmation	Culture Positive Cases	No. with MDR Susceptibility Testing*	Cases with Multidrug Resistance**					
			MDR Only	%	pre-XDR	%	XDR	%
2011	547	540	11	2.0	1	0.2	0	0.0
2012	511	503	4	0.8	1	0.2	0	0.0
2013	535	530	5	0.9	0	0.0	1	0.2
2014	476	473	4	0.8	1	0.2	0	0.0
2015	520	517	6	1.2	0	0.0	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 20. Tuberculosis Cases by Initial Drug Regimen: Los Angeles County, 2011-2015**

Year of Confirmation	Total Cases	Alive at Diagnosis	Started on Initial Drug Regimen	Initial Drug Regimen* (%)				
		Cases	Cases	IRZ,E/S	IRZ	IRE	IR	Other
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	640	639	90.0	0.9	2.2	0.5	6.4
2014	585	576	573	89.0	1.2	2.6	0.7	6.5
2015	604	587	579	88.6	1.0	1.9	0.0	8.5

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

**Table 21. Tuberculosis Cases by Type of Therapy Administration: Los Angeles County, 2011-2015**

Year of Confirmation	Total Cases	Cases Started on Initial Drug Regimen*	Cases w/ Information on Type of Therapy Administration	Type of Therapy Administration*					
				DOT		DOT and SAT		SAT Only	
				Cases	%	Cases	%	Cases	%
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	639	639	314	49.1	254	39.7	71	11.1
2014	585	573	573	277	48.3	246	42.9	50	8.7
2015	604	579	577	319	55.3	184	31.9	74	12.8

\*DOT=Directly observed therapy; SAT=Self-administered therapy. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

**Table 22. Treatment Outcomes among Tuberculosis Cases for whom One Year or Less of Therapy was indicated: Los Angeles County, 2011-2013\***

Treatment Status	Year of Confirmation					
	2011		2012		2013	
	Cases	%	Cases	%	Cases	%
Completed Treatment ≤ 1 year	489	90.5	454	93.2	491	92.6
Completed Treatment > 1 year	37	6.8	26	5.3	27	5.0

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

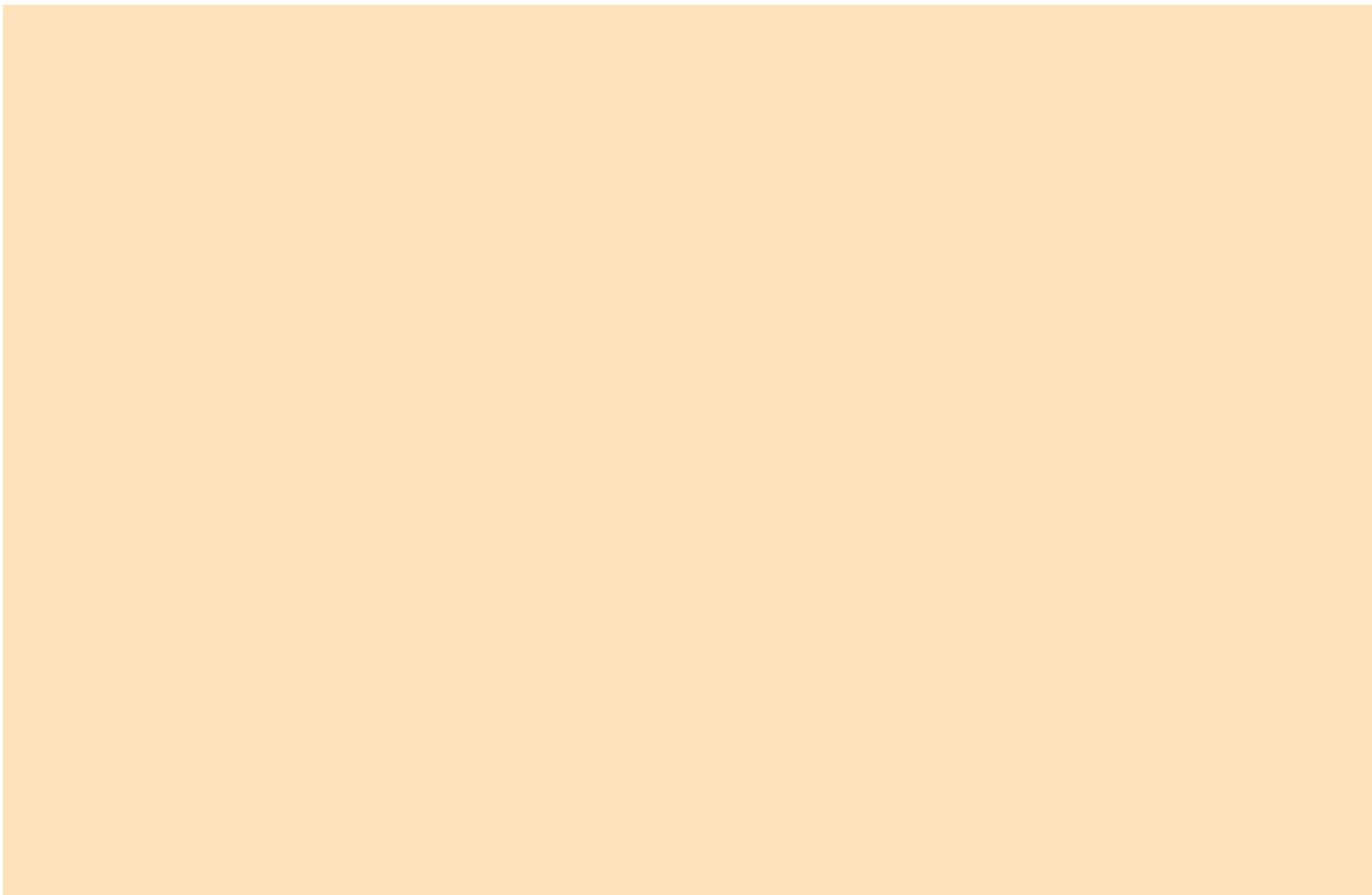
**Table 23. Mortality among Tuberculosis Cases: Los Angeles County, 2011-2015**

Year of Confirmation	Total Cases	Timing of Death					
		Total Deaths		Died Before Starting TB Therapy		Died During TB Therapy	
		Cases	%	Cases	%	Cases	%
2011	680	77	11.3	11	14.3	66	85.7
2012	625	79	12.6	17	21.5	62	78.5
2013	660	84	12.7	20	23.8	64	76.2
2014	586	61	10.4	11	18.0	50	82.0
2015	604	55	9.1	17	30.9	38	69.1

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

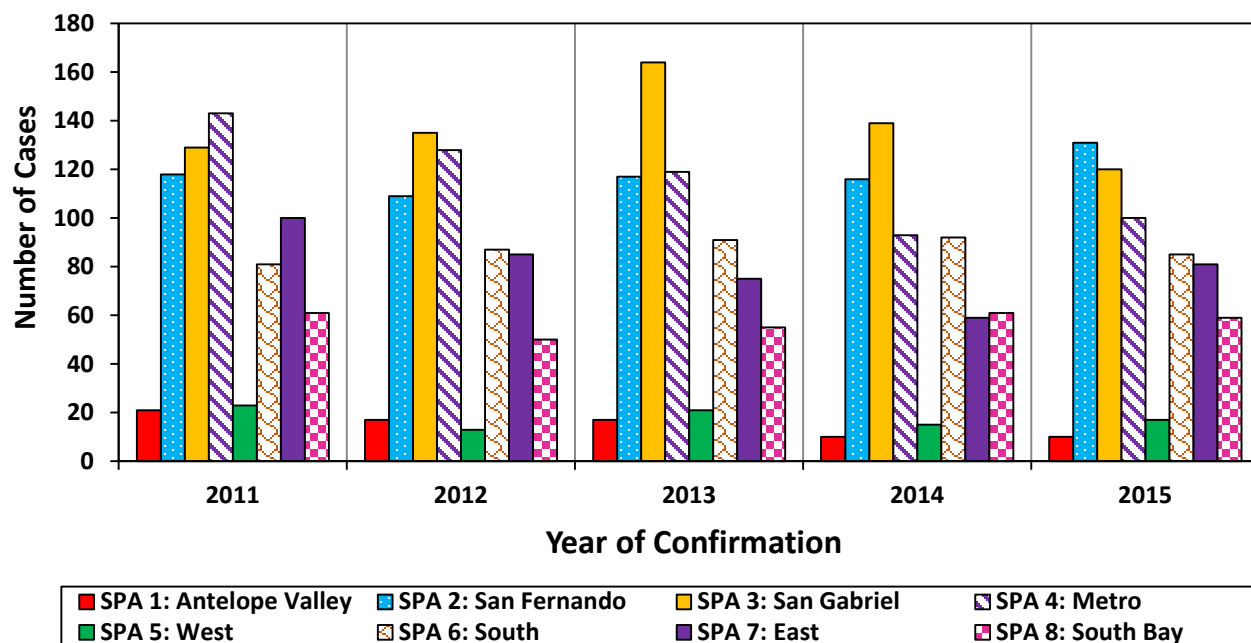


## **Tuberculosis Cases by Service Planning Area**





**Figure 16. Tuberculosis Cases by Service Planning Area (SPA)\*: Los Angeles County, 2011-2015**



\*TB cases assigned to TB Control Headquarters (n=8) not included in SPA counts. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

**Table 24. Tuberculosis Cases by Service Planning Area (SPA): LA County, 2015**

	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
<b>Race/Ethnicity**</b>										
NH White	136	32	<5	12	<5	<5	<5	<5	<5	<5
Black	98	43	<5	<5	<5	10	<5	21	<5	<5
Hispanic	759	256	5	50	25	43	5	61	50	17
Asian	1,139	273	<5	68	90	43	7	<5	26	35
<b>Age Group</b>										
0-4	36	5	<5	<5	<5	<5	<5	<5	<5	<5
5-14	32	6	<5	<5	<5	<5	<5	<5	<5	<5
15-24	186	40	<5	5	11	5	<5	8	7	<5
25-44	507	135	<5	33	22	23	8	25	13	10
45-64	693	225	6	52	35	35	<5	36	32	27
65+	679	193	<5	40	51	37	<5	10	29	18
<b>Sex</b>										
Female	883	252	<5	56	54	34	10	35	35	25
Male	1,250	352	7	75	66	66	7	50	46	34
<b>Birthplace</b>										
Non U.S.-Born	1,717	491	8	116	109	82	14	51	64	47
U.S.-Born	407	110	<5	15	11	18	<5	33	16	11
Unknown	9	3	<5	0	0	0	<5	<5	<5	<5
<b>Total Cases</b>	<b>2,133</b>	<b>604</b>	<b>10</b>	<b>131</b>	<b>120</b>	<b>100</b>	<b>17</b>	<b>85</b>	<b>81</b>	<b>59</b>

\*Report on Tuberculosis in California, 2015. CDPH, 2016. \*\*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 counts. Data exclude Long Beach and Pasadena TB cases. Data are provisional and subject to change.

**Table 25. Proportion of Tuberculosis Cases by Service Planning Area (SPA): LA County, 2015**

	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
<b>Race/Ethnicity**</b>										
NH White	6.4	5.3	10.0	9.2	2.5	4.0	23.5	1.2	4.9	5.1
Black	4.5	7.1	20.0	0.8	1.7	10.0	5.9	24.7	1.2	6.8
Hispanic	35.6	42.4	50.0	38.2	20.8	43.0	29.4	71.8	61.7	28.8
Asian	53.4	45.2	20.0	51.9	75.0	43.0	41.2	2.4	32.1	59.3
<b>Age Group</b>										
0-4	1.7	0.8	0.0	0.0	0.0	0.0	0.0	3.5	0.0	3.4
5-14	1.5	1.0	0.0	0.8	0.8	0.0	0.0	3.5	0.0	1.7
15-24	8.7	6.6	0.0	3.8	9.2	5.0	17.6	9.4	8.6	1.7
25-44	23.7	22.4	0.0	25.2	18.3	23.0	47.1	29.4	16.0	16.9
45-64	32.5	37.3	60.0	39.7	29.2	35.0	11.8	42.4	39.5	45.8
65+	31.9	32.0	40.0	30.5	42.5	37.0	23.5	11.8	35.8	30.5
<b>Sex</b>										
Female	41.3	41.7	30.0	42.7	45.0	34.0	58.8	41.2	43.2	42.4
Male	58.7	58.3	70.0	57.3	55.0	66.0	41.2	58.8	56.8	57.6
<b>Birthplace</b>										
Non U.S.-Born	80.5	81.3	80.0	88.5	90.8	82.0	82.4	60.0	79.0	79.7
U.S.-Born	19.1	18.2	20.0	11.5	9.2	18.0	17.6	38.8	19.8	18.6
Unknown	0.4	0.5	0.0	0.0	0.0	0.0	0.0	1.2	1.2	1.7
<b>Percent of Total</b>	-	-	1.7	21.7	19.9	16.6	2.8	14.1	13.4	9.8

\*Report on Tuberculosis in California, 2015. CDPH, 2016. \*\*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<sup>22</sup>.
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, Chapter 4, §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 of Regulations: Title 17, Chapter 4, §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<sup>3, 23</sup>. 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<sup>24</sup>. 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” regardless of race.
6. Age: Patient age was calculated by following Wang’s<sup>25</sup> formula for age calculation which uses a person’s birthday and takes into account leap year and non-leap year birthdays. For analyses presented in this report, patient 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 patients 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<sup>22</sup>.
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 2013 are the most recent available and are presented in this report. Completion of treatment is presented for years 2011-2013 in Table 22. 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. Data for 2015 are provisional and reflect the most complete information available as of July 2016. 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).

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# Tuberculosis Control Program

Los Angeles County Department of Public Health  
Tuberculosis Control Program  
2615 S. Grand Avenue, Room 507  
Los Angeles, CA 90007  
213-745-0800  
[tbc@ph.lacounty.gov](mailto:tbc@ph.lacounty.gov)

