



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

**2013**



## Table of Contents

<b>Table of Contents</b> .....	2
<b>Vision and Mission</b> .....	4
<b>Letter from the Director</b> .....	5
<b>Los Angeles County Department of Public Health</b> .....	6
<b>Tuberculosis Control Program Staff</b> .....	7
<b>Contributors and Acknowledgements</b> .....	8
<b>Background</b> .....	9
<b>Data Summary</b> .....	11
<b>Figures</b>	
Figure 1: Tuberculosis Cases and Case Rates: Los Angeles County, 1990-2013 .....	17
Figure 2: Tuberculosis Cases by Race/Ethnicity: Los Angeles County, 2009-2013 .....	18
Figure 3: Tuberculosis Case Rates by Race/Ethnicity: Los Angeles County, 2009-2013 .....	18
Figure 4: Tuberculosis Cases by Age Group: Los Angeles County, 2009-2013 .....	19
Figure 5: Tuberculosis Case Rates by Age Group: Los Angeles County, 2009-2013 .....	19
Figure 6: Tuberculosis in Children Younger than 5 Years Old: Los Angeles County, 2009-2013 .....	20
Figure 7: Tuberculosis Cases by Sex: Los Angeles County, 2009-2013 .....	21
Figure 8: Tuberculosis Case Rates by Sex: Los Angeles County, 2009-2013 .....	21
Figure 9: Tuberculosis Cases by Nativity: Los Angeles County, 2009-2013 .....	22
Figure 10: Tuberculosis Cases by Nativity and Sex: Los Angeles County, 2013 .....	23
Figure 11: Tuberculosis Cases by Nativity and Race/Ethnicity: Los Angeles County, 2013 .....	23
Figure 12: Tuberculosis Cases by Country of Birth: Los Angeles County, 2013 (n=662) .....	24
Figure 13: Comorbidities among Tuberculosis Cases: Los Angeles County, 2010-2013.....	25
Figure 14: HIV Co-Infected Tuberculosis Cases: Los Angeles County, 2009-2013.....	26
Figure 15: Reported Substance Abuse among Tuberculosis Cases: Los Angeles County, 2009-2013.....	27
Figure 16: Tuberculosis Cases Experiencing Homelessness: Los Angeles County, 2009-2013.....	28
Figure 17: Tuberculosis Cases by Site of Disease: Los Angeles County, 2013 (n=662).....	29
Figure 18: Drug Resistance among Tuberculosis Cases: Los Angeles County, 2013.....	30
Figure 19: Tuberculosis Cases by Therapy Administration: Los Angeles County, 2013.....	31
Figure 20: Deaths among Tuberculosis Cases: Los Angeles County, 2011-2013 (n=240) .....	32
Figure 21. TB Cases by Service Planning Area (SPA): Los Angeles County, 2009-2013 .....	60
<b>Tables</b>	
Table 1: Demographic Characteristics of Tuberculosis Cases: Los Angeles County, 2009-2013 .....	34
Table 2. Tuberculosis Cases by Race/Ethnicity and Age Group: Los Angeles County, 2009-2013 .....	36
Table 3. Tuberculosis Cases by Race/Ethnicity and Sex: Los Angeles County, 2009-2013 .....	38
Table 4. Tuberculosis Cases by Race/Ethnicity, Sex, and Age Group: Los Angeles County, 2013 .....	39
Table 5. Foreign-born Tuberculosis Cases by Race/Ethnicity and Age Group: Los Angeles County,	

2009-2013 .....	40
Table 6. Tuberculosis Cases by Comorbidities and Reported Substance Abuse: Los Angeles County, 2009-2013 .....	42
Table 7. Demographic Characteristics of HIV Co-Infected Tuberculosis Cases: Los Angeles County, 2009-2013 .....	43
Table 8. Demographic Characteristics of Tuberculosis Cases Experiencing Homelessness: Los Angeles County, 2009-2013.....	44
Table 9. Tuberculosis Cases Experiencing Homelessness by Race/Ethnicity and Sex: Los Angeles County, 2009-2013 .....	45
Table 10. Tuberculosis Cases Experiencing Homelessness by Race/Ethnicity and Age Group: Los Angeles County, 2009-2013.....	46
Table 11. Tuberculosis Cases Experiencing Homelessness by Race/Ethnicity and Reported Substance Abuse: LA County, 2009-2013.....	47
Table 12. Tuberculosis Cases Experiencing Homelessness by Race/Ethnicity and Nativity: Los Angeles County, 2009-2013.....	49
Table 13. Tuberculosis Cases by Site of Disease: Los Angeles County, 2009-2013 .....	50
Table 14. Tuberculosis Cases by Verification Criteria: Los Angeles County, 2010-2013 .....	51
Table 15. Tuberculosis Cases with Resistance to Rifampin: Los Angeles County, 2009-2013.....	52
Table 16. Tuberculosis Cases with Resistance to Isoniazid: Los Angeles County, 2009-2013 .....	52
Table 17. Tuberculosis Cases with Resistance to Pyrazinamide: Los Angeles County, 2009-2013 .....	52
Table 18. Tuberculosis Cases with Resistance to Ethambutol: Los Angeles County, 2009-2013 .....	53
Table 19. Tuberculosis Cases with Resistance to Streptomycin: Los Angeles County, 2009-2013 .....	53
Table 20. Tuberculosis Cases with Multidrug Resistance: Los Angeles County, 2009-2013 .....	54
Table 21. Tuberculosis Cases by Initial Drug Regimen: Los Angeles County, 2009-2013.....	55
Table 22. Tuberculosis Cases by Type of Therapy Administration: Los Angeles County, 2010-2013.....	56
Table 23. Treatment Outcomes among Tuberculosis Cases for whom One Year or Less of Therapy was indicated: Los Angeles County, 2009-2012.....	57
Table 24. Deaths in Persons with Tuberculosis: Los Angeles County, 2009-2013.....	58
Table 25. Tuberculosis Cases by Service Planning Area (SPA): Los Angeles County, 2013.....	61
Table 26. Proportion of Tuberculosis Cases by Service Planning Area (SPA): Los Angeles County, 2013.....	62
<b>Tuberculosis Cases by Service Planning Area (SPA) .....</b>	<b>59</b>
<b>Technical Notes .....</b>	<b>63</b>
<b>References .....</b>	<b>65</b>

# Tuberculosis Control Program

## VISION

TB is eliminated from Los Angeles County

## MISSION

To prevent the transmission of TB  
within Los Angeles County





**CYNTHIA A. HARDING, M.P.H.**  
Interim Director

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

**PETER R. KERNDT, M.D., M.P.H.**  
Acting Director, Tuberculosis Control Program

2615 S. Grand Avenue, Room 507  
Los Angeles, California 90007  
TEL (213) 745-0811 • FAX (213) 743-4864

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

**BOARD OF SUPERVISORS**

**Hilda L. Solis**  
First District

**Mark Ridley-Thomas**  
Second District

**Sheila Kuehl**  
Third District

**Don Knabe**  
Fourth District

**Michael D. Antonovich**  
Fifth District

March 6, 2015

Dear Colleagues,

I am pleased to provide you with the 2013 "Tuberculosis in Los Angeles County: Surveillance Report." This report examines and presents a snapshot of tuberculosis in Los Angeles County (LAC). While TB cases continue to decline in LAC as a whole, in 2013, there was an increase from 625 confirmed cases in 2012 to 662 confirmed cases in 2013. Similar to past years, our tuberculosis case rate (7.0 per 100,000) was higher than the overall rate for California (5.7 per 100,000) and the United States (3.0 per 100,000).

In the past 5 years, we have seen improved initiation of an initial 4-drug tuberculosis regimen (60% to 90%) and timely completion of treatment (80% to 89%). However, many challenges remain. In 2013, a majority of tuberculosis cases were seen among racial/ethnic minority individuals, most of whom were foreign-born. The TB Control Program is working on the early detection and treatment of tuberculosis infection (TBI) among high-risk foreign-born individuals by focusing on newly arriving immigrants, refugees, and asylees.

In addition, addressing TB among persons experiencing homelessness and those with medical comorbidities that increase the risk of TB disease, and other high risk populations, continues to be priority areas for our program. Increasing the use of interferon-gamma release assays (IGRAs) and the treatment of TBI using the shorter course once weekly for 12 weeks regimen of Isoniazid-Rifapentine (3HP) along with the use of directly observed therapy are important strategies that will be continued and expanded over the coming year.

Hard work and creative and innovative strategies are essential components in our continued fight against tuberculosis. 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 tuberculosis.

Sincerely,

A handwritten signature in black ink that reads "Peter R. Kerndt". The signature is fluid and cursive.

Peter R. Kerndt, M.D., M.P.H.  
Acting Director of Tuberculosis Control Program  
Los Angeles County Department of Public Health

**Los Angeles County Board of Supervisors**

Hilda L. Solis, First District  
Mark Ridley-Thomas, Second District  
Sheila Kuehl, Third District  
Don Knabe, Fourth District  
Michael D. Antonovich, Fifth District

**Los Angeles County Department of Public Health**

Cynthia A. Harding, MPH  
Interim Director

Jeffrey Gunzenhauser, MD, MPH  
Interim Health Officer

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

Robert Kim-Farley, MD, MPH  
Director

## **Tuberculosis Control Program Staff**

**March 2015**

Dr. Peter R. Kerndt, Acting Director

### **Administration Unit**

Yolanda Martinez, Cherry Tam

### **CDC**

Stuart McMullen, Shameer Poonja, Jamiee Gomez,  
Kim Do, Lauren Linde, Nora Fritz

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

Kai-Jen Cheng, Craig Toyota, Bryon Garcia

### **Education & Evaluation Unit**

**April King-Todd**

Nichelle Simon, Toni Stephens, Socorro Rodriguez, Rita Larranaga, Gloria Price, Avis Brooks,  
Eunice Edmond, Toi Brown, Peggy Green, Antoinette Edwards, Jose Leiva, Sandra Bible  
Robert Miodovski, Yen Nguyen, Hasmik Grigorian, Cris M. Cuevas, Sharelle Carr,  
Rebecca Park, Doris Jones, Stephanie Burton

### **Epidemiology & Research Unit**

**Jo Kay Ghosh**

Julie Lo, Terese Brookins, Josephine Yumul, Monica Rosales, Ying Ker,  
Kay Parks, Edward Lan, Christopher Rogers

### **Medical Consultation Unit**

Dr. Steven K. Hwang, Dr. Rashmi J. Singh, Dr. Alicia Chang

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

**Jeanne Soukup**

Tearah Taylor, Maria Mejia, Alejandra Novelo, Elizabeth Valencia, Gwendolyn Jones, Cynthia Tello,  
Karen Hurst, Salina Yu, Ana Hernandez, Jimmy Ruiz, Yesenia Eras, La Tonia Johnson, Sunny Y. Chun,  
Elvia Flores, Leticia Reyna-Terry, Yingyos Sinitvong, Nadine Flores, Cathy Ruiz, Hattie Morris

### **Volunteers**

Uyen Truong, Jessica Yeats,  
Adam Readhead, Sanghyuk Shin

# Tuberculosis in Los Angeles County: Surveillance Report 2013

---

Suggested Citation: Tuberculosis in Los Angeles County: Surveillance Report 2013. Los Angeles County Department of Public Health, Tuberculosis Control Program, Los Angeles, CA. March 2015.

A PDF of this report is available on our website: <http://publichealth.lacounty.gov/tb/>

---

**Tuberculosis Control Program**

Peter R. Kerndt, M.D., MPH, Acting Director

**Epidemiology and Research Unit**

Jo Kay Ghosh, MPH, Ph.D., Supervising Epidemiologist

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

**Edited by:** Jo Kay Ghosh, MPH, Ph.D.; Terese Brookins, DDS, MPH; Josephine Yumul, MSc

**Cover:** Cover art and photo by Christopher Rogers.

## **ACKNOWLEDGEMENTS**

Special thanks to the health center staff who managed all Tuberculosis cases and suspects and provided all patient-related data, Information Systems staff who created and managed the databases, liaison nurses and Assistant Program Specialists for their role in data quality assurance and providing patient services, Registry staff who entered data into the database with attention to accuracy, Epidemiology and Research Unit staff who analyzed the data, and all Tuberculosis Control Program management for their support of our work.

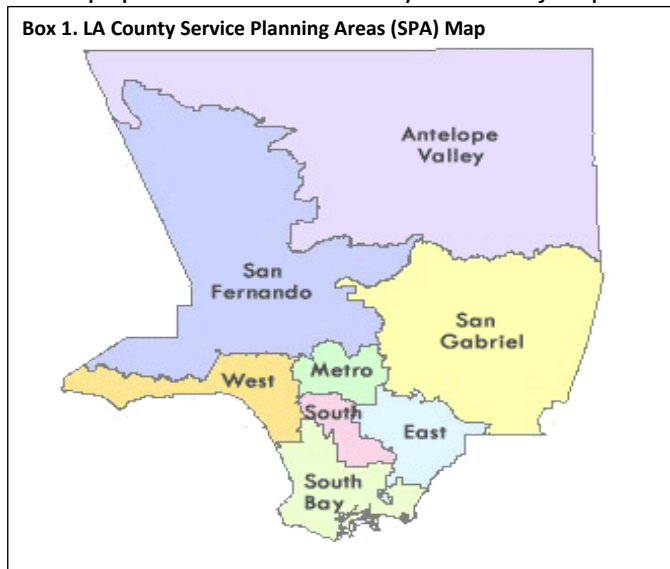


# Background

## 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, 1% Native American/American Indian, and 27% 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 the 2013 U.S. Census estimates, 35% of LA County residents are foreign-born and almost 57% speak a language other than English at home<sup>1</sup>.

Due to its large size, LA County is divided into 8 specific 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 screening and treatment services. Specifically, patients receive 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 (SPA 4); Hollywood/Wilshire Health Center (SPAs 4 & 5); Martin Luther King Jr. Health Center (SPA 6); Whittier Health Center (SPA 7); Curtis R. Tucker Health Center and Torrance 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 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 care at one of the eleven LA County Public Health Clinics, three County hospitals, or through private medical providers.

## BRIEF OVERVIEW OF TUBERCULOSIS

### Tuberculosis Disease

Tuberculosis (TB) is an airborne disease caused by a bacterium called *Mycobacterium tuberculosis* (*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 a closely related mycobacterial species 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 (TBI)<sup>5</sup>.

### **Tuberculosis Infection**

A diagnosis of TBI indicates a person is infected with TB, but is not currently experiencing 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 TBI<sup>6, 7</sup>. In the U.S. it is estimated that about 11 million people (4%) have TBI<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 TBI 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 be infected with TB. 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 in 2013 (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. 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 2013, there were a total of 662 cases of tuberculosis (TB) confirmed in Los Angeles (LA) County. This represents a 6% increase from 625 cases in 2012. The TB case rate slightly increased from 6.7 per 100,000 during 2012 to 7.0 per 100,000 in 2013 (Figure 1). LA County reported the 7<sup>th</sup> highest TB case rate among 61 California reporting health jurisdictions. The TB incidence rate in LA County in 2013 was higher than the overall state case rate (5.7 per 100,000)<sup>10</sup> and more than twice the national case rate (3.0 per 100,000)<sup>11</sup> (Box 2).

Box 2. TB Case Rates, 2013			
	LA County	California*	United States**
<b>Total Cases</b>	662	2,169	9,582
<b>Rate per 100,000</b>	7.0	5.7	3.0
*Report on Tuberculosis in California, 2013, CDPH, 2014. **Reported Tuberculosis in the United States, 2013. CDC 2014.			

## DEMOGRAPHIC PROFILE

### Race/Ethnicity Distribution

In 2013, Hispanics (44%) and Asians (41%) accounted for 85% of TB cases in LA County (Figure 2). The TB case rate was highest among Asians (20.1 per 100,000), followed by Blacks (7.7 per 100,000), Hispanics (6.4 per 100,000), and non-Hispanic Whites (1.4 per 100,000) (Figure 3). TB case rates among Asians (20.1 per 100,000), Blacks (7.7 per 100,000), and Hispanics (6.4 per 100,000) were 14.4, 5.5, and 4.6 times higher than among non-Hispanic Whites (1.4 per 100,000), respectively. Hispanics represented a greater number of TB cases (292 cases in 2013) in LA County compared to other racial/ethnic groups. Between 2012 and 2013, cases increased by 2% among Hispanics and 11% among Asians (Table 1).

### Age and Sex Distribution

Thirty-one percent of TB cases (n=208) 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 125 (18.9%) and 117 (17.7%) cases, respectively (Table 1). The TB case rate was highest for people 65 years and older (18.8 per 100,000), followed by individuals 55-64 years of age (11.7 per 100,000), by those 45-54 years of age (7.5 per 100,000), and by those 35-44 years of age (7.3 per 100,000) (Figure 5). Among adults, the largest increase in numbers of cases in 2013 compared to the previous year was seen among patients aged 35-44 years (45%) and 65+ years (7.5%), (Table 1). The estimated growth of the older population<sup>12</sup> is accompanied by an increased risk of developing co-occurring chronic health conditions<sup>13</sup>. Among older individuals, medical comorbidities can increase their risk of developing active TB and may increase the complexity of medical treatment<sup>10, 14, 15</sup>.

In 2013, there were 18 cases of TB among children aged 0 to 4 years, with a case rate of 2.7 per 100,000 (Figure 6). From 2012 to 2013, the number of cases among children 0-4 years of age increased from 9 cases to 18 cases. Additionally, we observed an increase from 4 cases to 7 cases among children 5-14 years of age, (Table 1). These relatively small numbers fluctuate from year to year, and the 2013 case rate for children aged 0 to 4 years was slightly higher in 2013 compared to the average from the previous 5 years (2.3 per 100,000).

In 2013, TB in LA County occurred more often among males (401 cases, 61%) compared to females (261 cases, 39%), (Table 1; Figure 7). The TB case rate was higher among males (8.6 per 100,000) compared to

females (5.5 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.

### **Nativity Distribution**

In 2013, TB cases among foreign-born individuals (n=558) were 4 times higher than among U.S.-born individuals (n=133) (Table 1). For the past five years, foreign-born cases have accounted for approximately 80% of TB cases (Figure 9). Foreign-born TB patients in 2013 consisted of 311 (59%) males and 217 (41%) females (Figure 10). Among foreign-born TB patients with a known place of birth, 50% were Asian, 44% were Hispanic, 3% were non-Hispanic White, and 2% were Black (Figure 11). Two-thirds (66%) of foreign-born TB cases originated from the following 7 countries: Mexico, Philippines, China, Vietnam, Guatemala, Korea (North and South), and El Salvador (Figure 12). Among U.S.-born TB cases, 47% were Hispanic, 34% were Black, 15% were non-Hispanic White, and 5% were Asian (Figure 11). Table 5 summarizes foreign-born TB cases by race/ethnicity and age.

### **Medical Comorbidities**

In 2013, 38% of TB cases had one or more medical comorbidities, including diabetes mellitus, end stage renal disease (ESRD), HIV, or another immunosuppressive condition. These comorbidities increase a person's risk of progression from TBI to active TB disease. Among the conditions mentioned above, in 2013 the most common comorbidity reported was diabetes mellitus (n=185; 28%) (Table 6). In fact, from 2010 to 2013, diabetes mellitus has been the most common co-occurring medical condition among TB cases, ranging from 24% to 28% (Figure 13).

### **HIV Co-Infected Cases**

In 2013, there were 23 (3.9% of cases with known HIV status) TB cases co-infected with HIV (Figure 14; Table 6). Of the total 662 TB cases, information on HIV status was available for 593 (90%) of the cases. Table 7 presents HIV co-infected TB cases by demographic characteristics. Among HIV positive TB patients in 2013, 30% were Black and 47% were Hispanic. Foreign-born individuals accounted for 56% of the cases with HIV co-infection. Also, 34% of HIV co-infected TB cases reported experiencing homelessness in the past year (Table 7).

### **Substance Abuse**

Recent history of reported substance abuse (defined as within the past year) is also a prevalent condition among TB cases. In 2013, excess alcohol use was the most commonly reported type of substance abuse (10%), followed by non-injecting drug use (6.5%), and injecting drug use (1.4%) (Figure 15; Table 6). 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 TBI or TB disease<sup>16</sup>.

### **Homelessness**

In 2013, there were 66 (10%) TB cases reported as being homeless in the past year (Figure 16). Among TB cases experiencing homelessness, 51% were Hispanic, 35% were Black, 9% were non-Hispanic white, and 4% were Asian (Table 8). Among homeless TB cases, 88% were male, and 53% were foreign-born, while 46% were U.S.-born (Table 8). Substance abuse was commonly reported among cases with a recent history of homelessness, with excess alcohol use (54%) being the most commonly reported form of substance abuse, followed by non-injecting drug use (29%), and injected drug use (6%). Tables 9, 10, 11, and 12 present homeless TB cases by demographic characteristics.

## **TUBERCULOSIS DISEASE MANAGEMENT AND CHARACTERISTICS**

### **Site of Disease and Verification Criteria**

In 2013, 69% of TB cases were diagnosed with Pulmonary TB only, while 19% were diagnosed with extra-pulmonary TB only, and 12% were diagnosed with both pulmonary and extra-pulmonary TB disease sites (Table 13; Figure 17). In terms of verification criteria, 85% of TB cases in 2013 were laboratory confirmed cases and 15% were clinically confirmed cases (Table 14). Similarly, for years 2010 to 2012, approximately 80% of LA County TB cases were laboratory confirmed cases.

### **Susceptibility Testing**

Figure 18 and Tables 15, 16, 17, 18, and 19 summarize the results of drug susceptibility testing (DST). In 2013, there were 533 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=528), isoniazid (n=528), pyrazinamide (n=526), ethambutol (n=528) and streptomycin (n=505) (Tables 18-22). Among cases with DST results, 1 (0.2%) had resistance to rifampin, 49 (9.4%) had resistance to isoniazid, 34 (6.5%) had resistance to pyrazinamide, 3 (0.6%) had resistance to ethambutol, and 44 (8.4%) had resistance to streptomycin. Resistance to these first-line drugs has remained fairly stable over the past 5 years (2009-2013).

Multidrug resistant TB (MDR-TB), defined as having resistance to both isoniazid and rifampin, was identified in 6 (1%) TB cases in year 2013 (Table 20; Figure 18). Among these MDR cases, 1 case was an XDR (Extensively Drug Resistant) case (Table 20). Despite the significant growth of MDR-TB cases in some global regions<sup>17, 18</sup>, in LA County, MDR-TB has remained a small proportion of TB cases, averaging between 1% and 2% of TB cases during 2009-2013. Treatment for TB patients with MDR-TB is often more complex, and requires lengthier (1 ½ to 2 years) and more costly treatment regimens<sup>17-19</sup>.

### **Initial Drug Regimen and Type of Therapy Administration**

Of the 662 TB cases confirmed in 2013, 639 were reported to be alive at diagnosis and having started an initial TB drug regimen (Table 21). The majority of these TB cases (90%) 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 60% to 90% (Table 21). This indicates successful steps taken by the TBCP to ensure appropriate treatment of patients afflicted by TB disease.

Information regarding type of therapy administration was available for 558 of the TB cases started on an initial drug regimen (Table 22). Of these cases, 55% were on directly observed therapy (DOT), 43% were on a combination of DOT and self-administered therapy (SAT), and 2% were on SAT only (Table 22; Figure 19). From 2010 to 2013, the proportion of TB cases on DOT only has decreased (69% to 55%), while the proportion of cases on DOT and SAT has increased (16% to 42%), (Table 22).

### **Treatment Outcomes**

In 2012, there were 506 TB patients for whom therapy of one year or less was indicated. Among these patients, 89.7% completed therapy within 12 months (Table 23 ). There were also 27 (5.3%) patients who took longer than 12 months to complete treatment. From 2009 to 2012, the proportion of TB cases completing treatment within one year has been steadily increasing from 80% to 89% (Table 23).

## Mortality in Persons with Tuberculosis

From 2011-2013, there were a total of 240 deaths among TB cases (Table 24; Figure 20). Among TB cases who died, 79% died during treatment, 20% died before starting treatment, and 1% died after starting treatment.

## GEOGRAPHIC DISTRIBUTION

### LA County: Service Planning Areas

Figure 21 and Tables 25 and 26 present demographic characteristics for TB cases by Service Planning Area (SPA) for year 2013. Among the 8 SPAs, 4 SPAs reported the highest number of TB cases in 2013 (Tables 25 and 26). Specifically, SPA 3: San Gabriel Valley reported 164 cases (25%), SPA 4: Metro reported 119 cases (18%), SPA 2: San Fernando Valley reported 118 cases (18%), and SPA 6: South reported 91 cases (14%).

## SCREENING FOR TUBERCULOSIS INFECTION (TBI)

### 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 2013, PHL reported results for QFT tests administered at Community Health Services (CHS) Public Health Clinics, HIV Care Clinics, and Contract Clinics. QFT tests ordered by Employee Health Services and processed by PHL were not included in these data. Out of approximately 16,926 QFT specimens, a total of 2,336 QFT specimens tested positive. Among these QFT tests, 67% were administered at CHS Clinics,

<b>Box 3. Positive Test Results from QFT Performed by the LA County Public Health Laboratory, by Clinic Type: LA County, 2013*</b>		
<b>Clinic Type</b>	<b>Total*</b>	<b>%</b>
<b>CHS Clinics**</b>	1,578	67.5
<b>HIV Care Clinics</b>	747	32.0
<b>Contract Clinics</b>	11	0.5
<b>Total tests</b>	2,336	100.0

\*Positive test results only; \*\*CHS=Community Health Services.

32% at HIV Care Clinics, and less than 1% at Contract Clinics (Box 3). Additionally, in recent years CHS clinics have begun using T-Spot IGRA tests, with the goal of identifying persons infected with TB among high risk populations. IGRA tests are an important tool to aid in the diagnosis of TBI, particularly among patients who were previously vaccinated with BCG, or patients who are unlikely to return for a skin test reading. High priority populations that should be targeted for TBI screening include individuals with at least one of the following risk factors: infected with HIV or at risk of infection, 5 years of age and younger, immunocompromised medical conditions (other than HIV), foreign-born from a country with high TB prevalence, injecting drug use, homelessness, living or working with individuals at risk for TB. TBI 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

We are also working on the early detection and treatment of TBI among high-risk foreign-born individuals. To achieve this, focus is placed on newly arriving 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 (TBI) or Class B3 (contact to known TB case) TB notification, that should be promptly evaluated, as outlined in guidelines from CDC<sup>20</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 TBI 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.

## **SUMMARY**

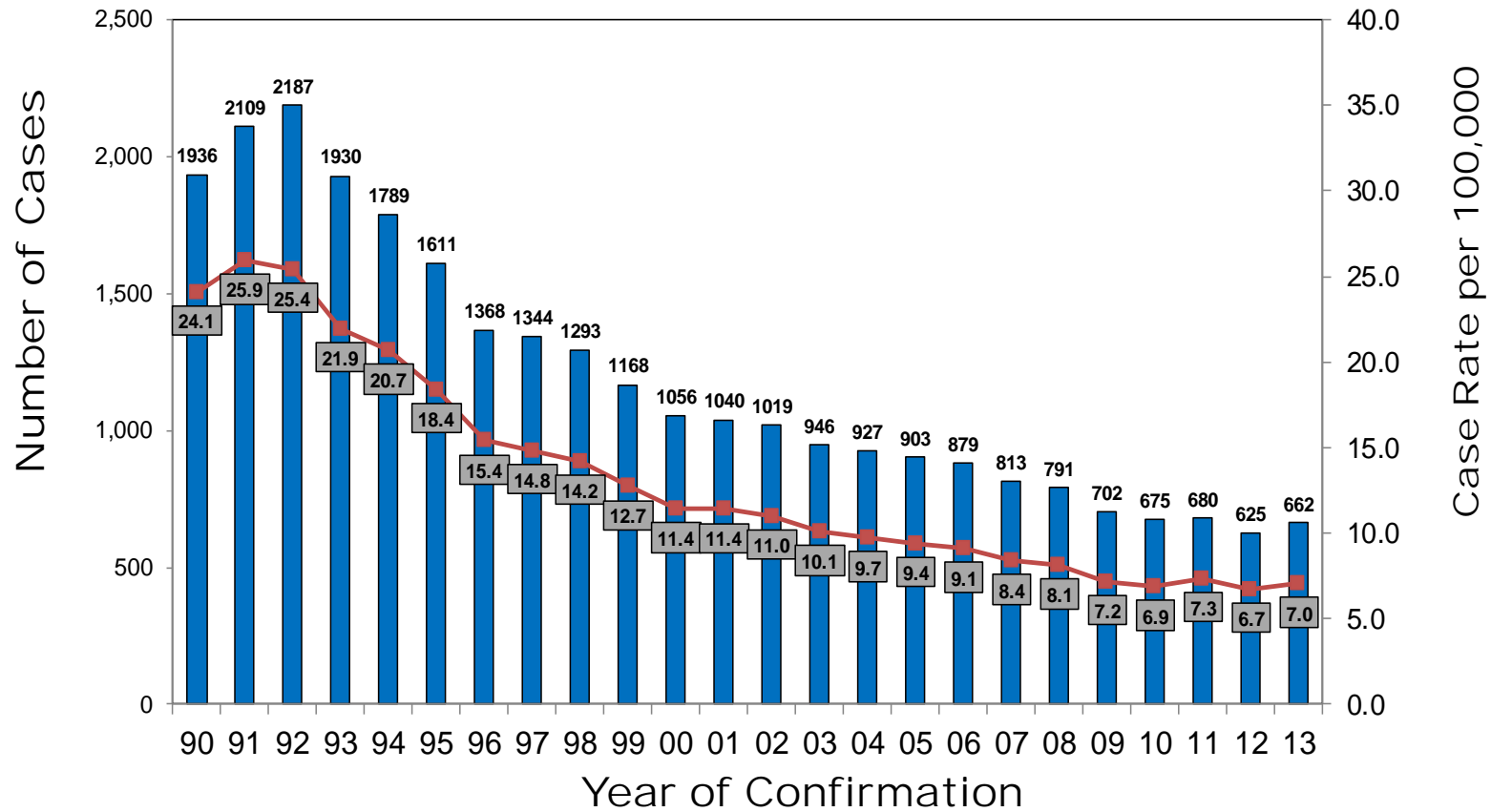
This report reflects our progress in the fight against TB, and a measure of the large amount of work left to do to achieve TB elimination. This year we continued to see that the majority of cases were seen among racial/ethnic minority individuals, most of whom were foreign-born. Over the past four years, we have seen a decrease in the use of exclusive DOT (69% to 55%) and an increase in combined DOT and SAT (16% to 42%). This treatment combination of therapy administration appears to be working, given that in the same time period we have seen improved initiation of an initial 4-drug TB regimen (65% to 90%) and timely completion of treatment (83% to 89%). Despite our accomplishments, increased efforts and new and innovative strategies are needed to reduce TB incidence in high risk populations, including the foreign-born, newly arrived immigrants, persons with immunocompromised medical conditions, and the homeless.

It is also important to focus on minimizing incomplete data and delayed reporting so that our surveillance data can accurately reflect the detection and treatment of TB. Of great importance is also the need for strategies and interventions to track and monitor individuals with TBI in LA County in order to prevent the progression from infection to active disease and the spread of TB among our residents. We have developed this report, which is designed as a TB informational resource, to provide a snapshot of our work in the prevention and control of TB and our strides toward the elimination of TB in LA County.

# FIGURES



**Figure 1: Tuberculosis Cases and Case Rates: Los Angeles County, 1990-2013\***

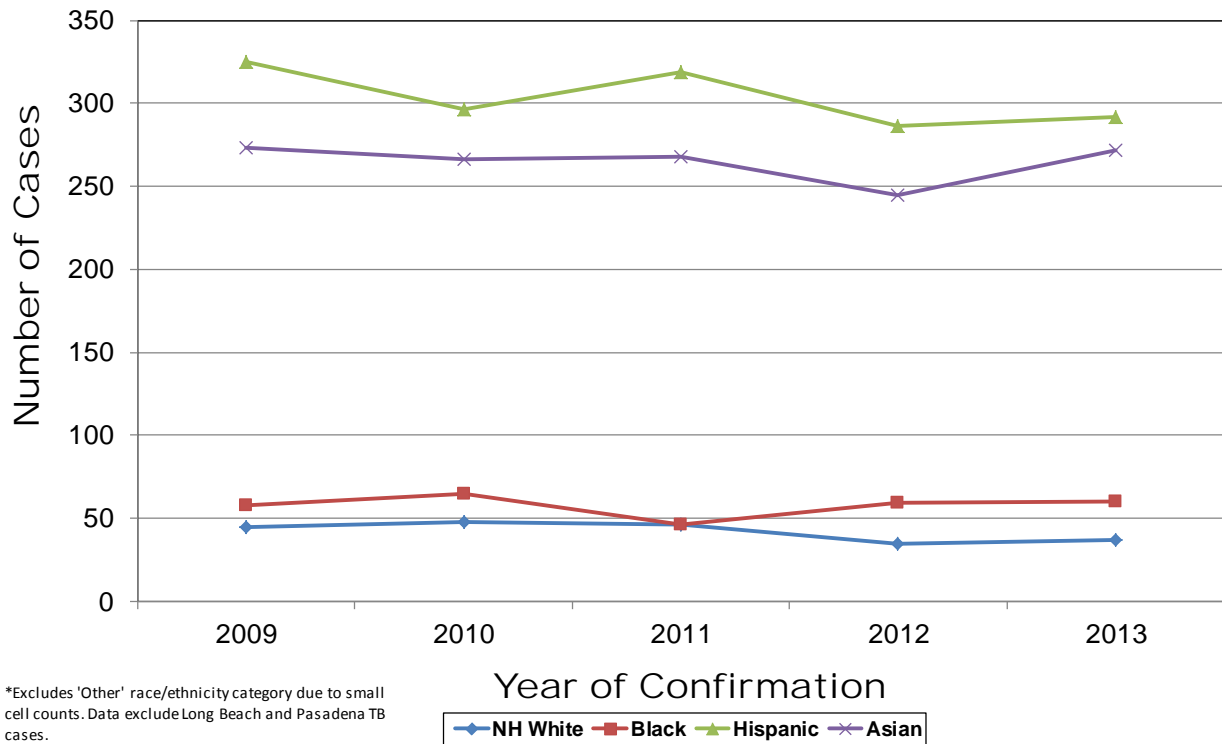


\*Data excludes Long Beach and Pasadena TB cases.

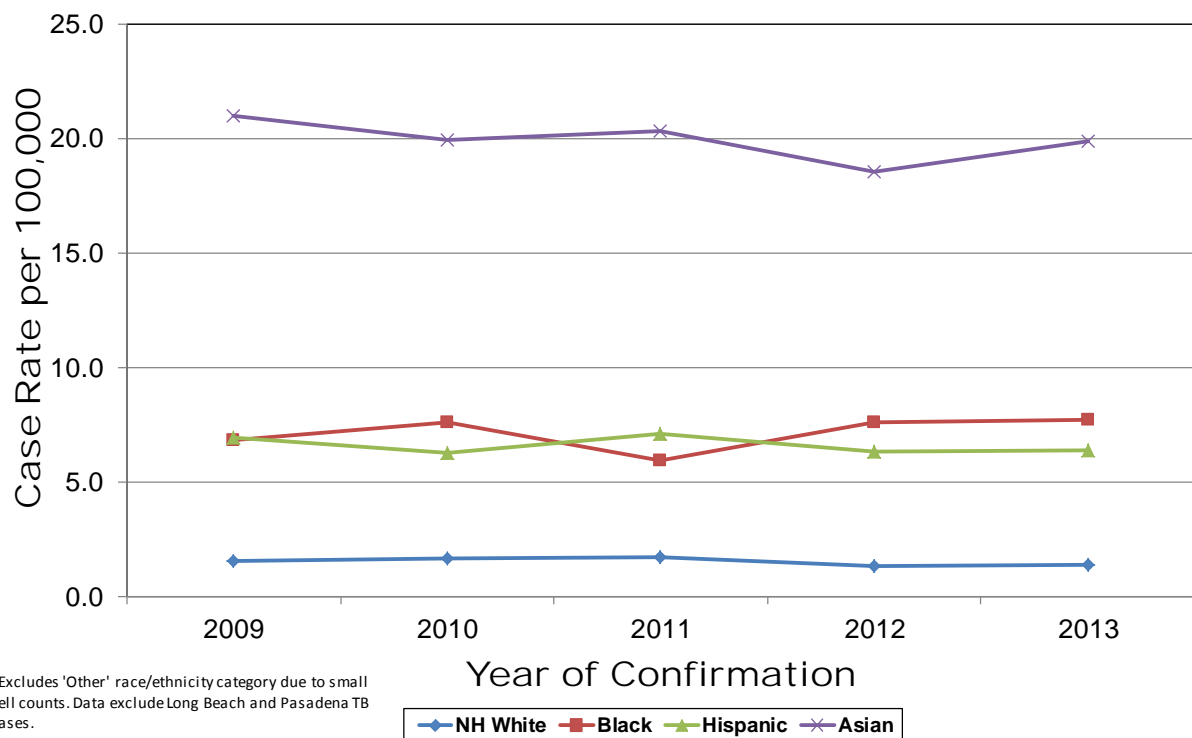
■ Number of Cases    — Case Rate per 100,000 Population

**In 2013, LA County had the 7th highest TB case rate (7.0 per 100,000) among California’s 61 health jurisdictions, reporting a total of 662 TB cases.**

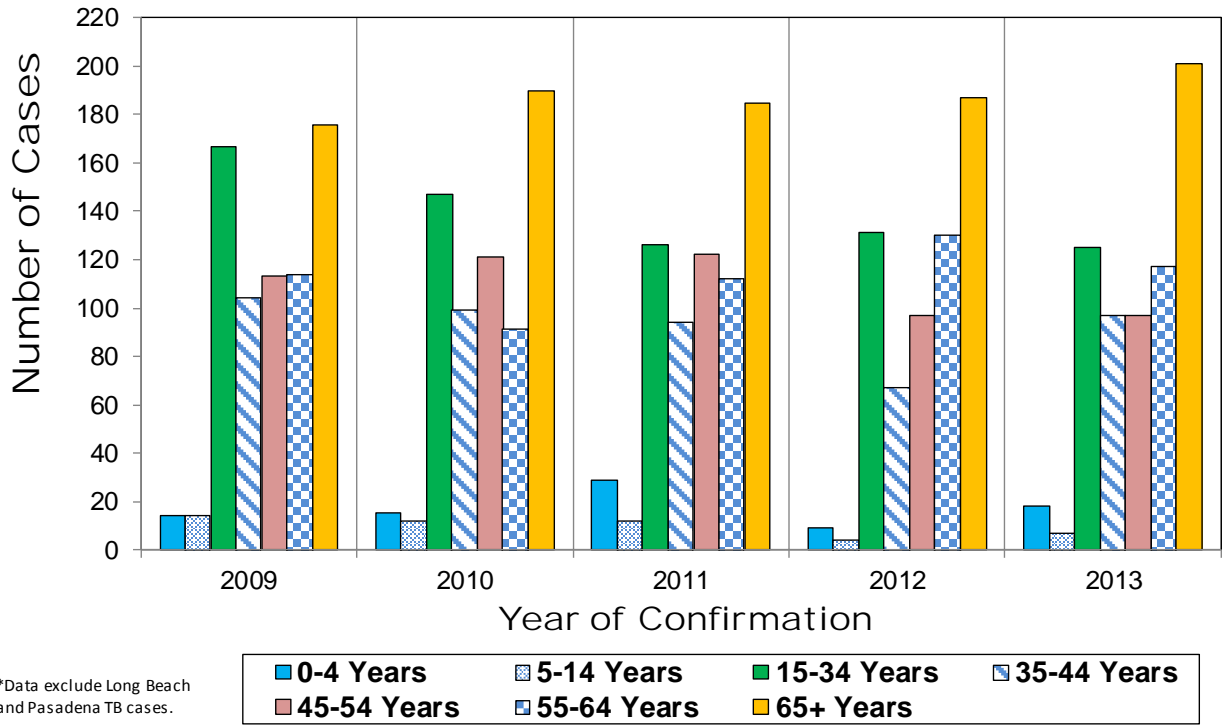
**Figure 2: Tuberculosis Cases by Race/Ethnicity: Los Angeles County, 2009-2013\***



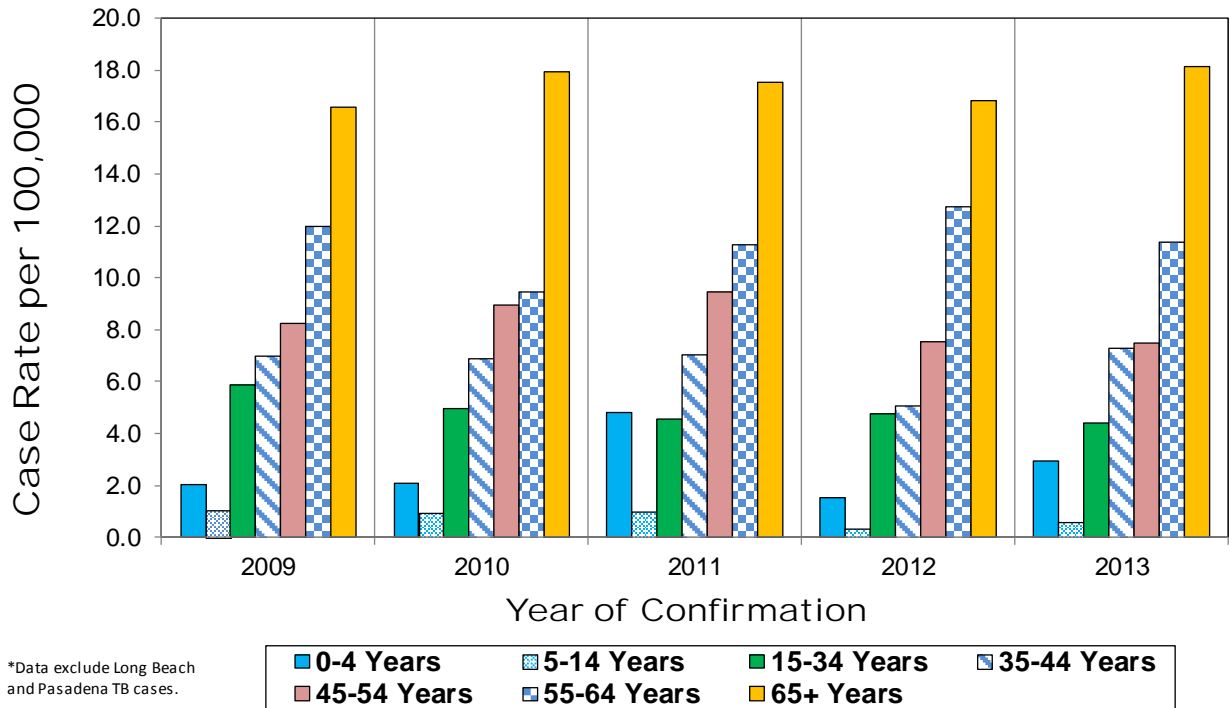
**Figure 3: Tuberculosis Case Rates by Race/Ethnicity: Los Angeles County, 2009-2013\***



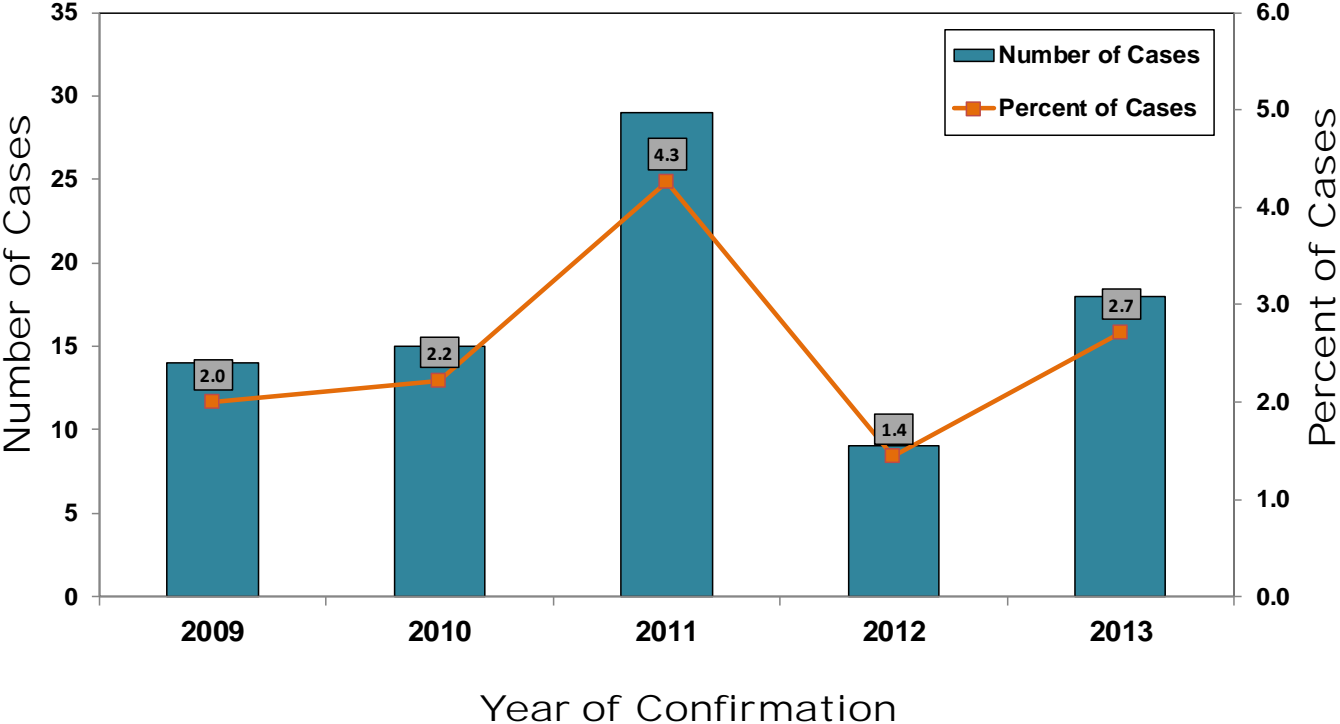
**Figure 4: Tuberculosis Cases by Age Group: Los Angeles County, 2009-2013\***



**Figure 5: Tuberculosis Case Rates by Age Group: Los Angeles County, 2009-2013\***



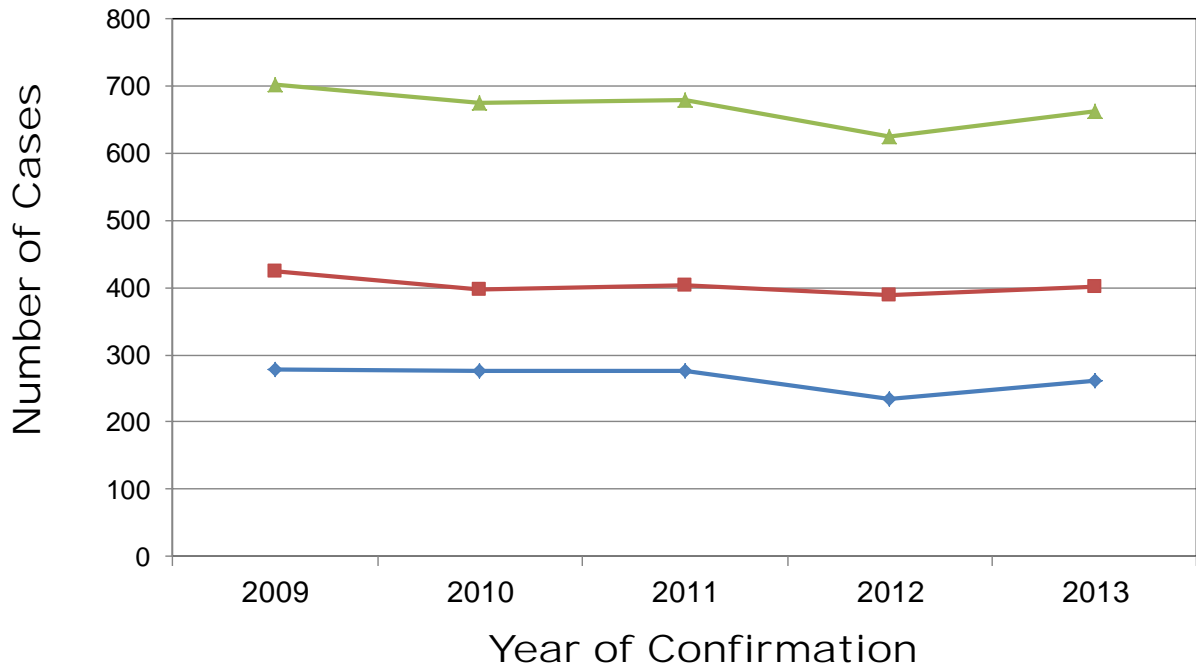
**Figure 6: Tuberculosis in Children Younger than 5 Years Old: Los Angeles County, 2009-2013\***



\*Data exclude Long Beach and Pasadena TB cases.

**TB among children 0 to 4 years old represented 2.7% of all cases reported in 2013. The incidence rate was higher in 2013 (3.0 per 100,000) compared to the combined 2009-2012 rate (2.3 per 100,000).**

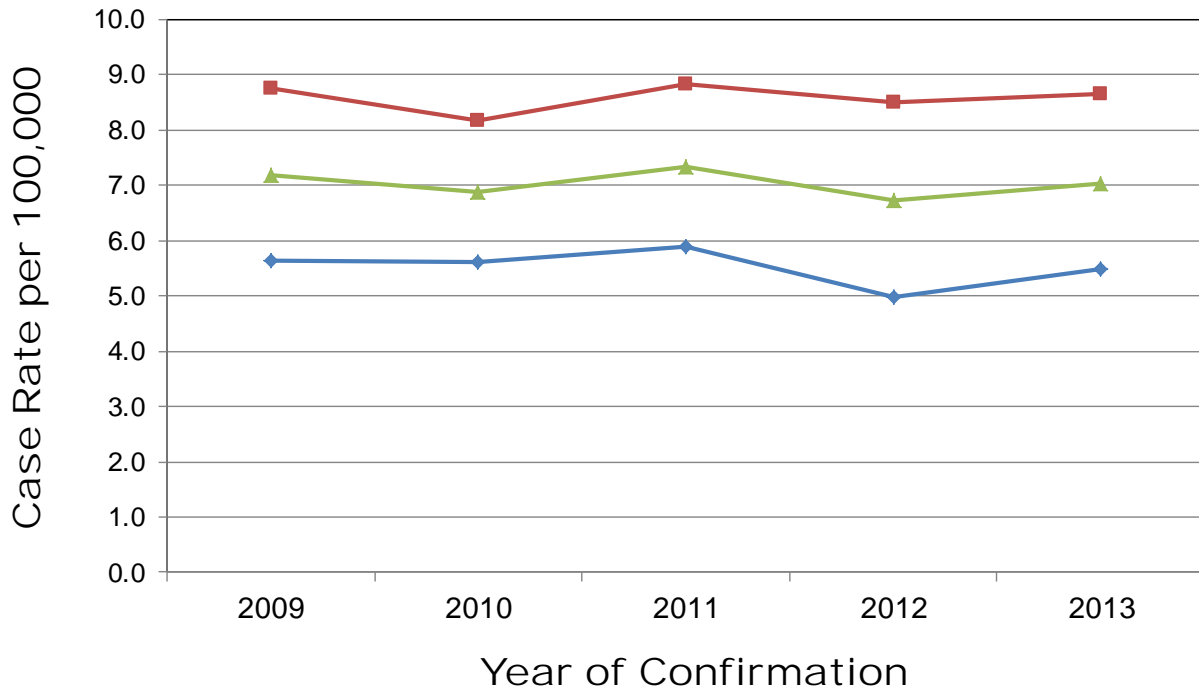
**Figure 7: Tuberculosis Cases by Sex: Los Angeles County, 2009-2013\***



\*Data exclude Long Beach and Pasadena TB cases.

◆ Female ■ Male ▲ Total

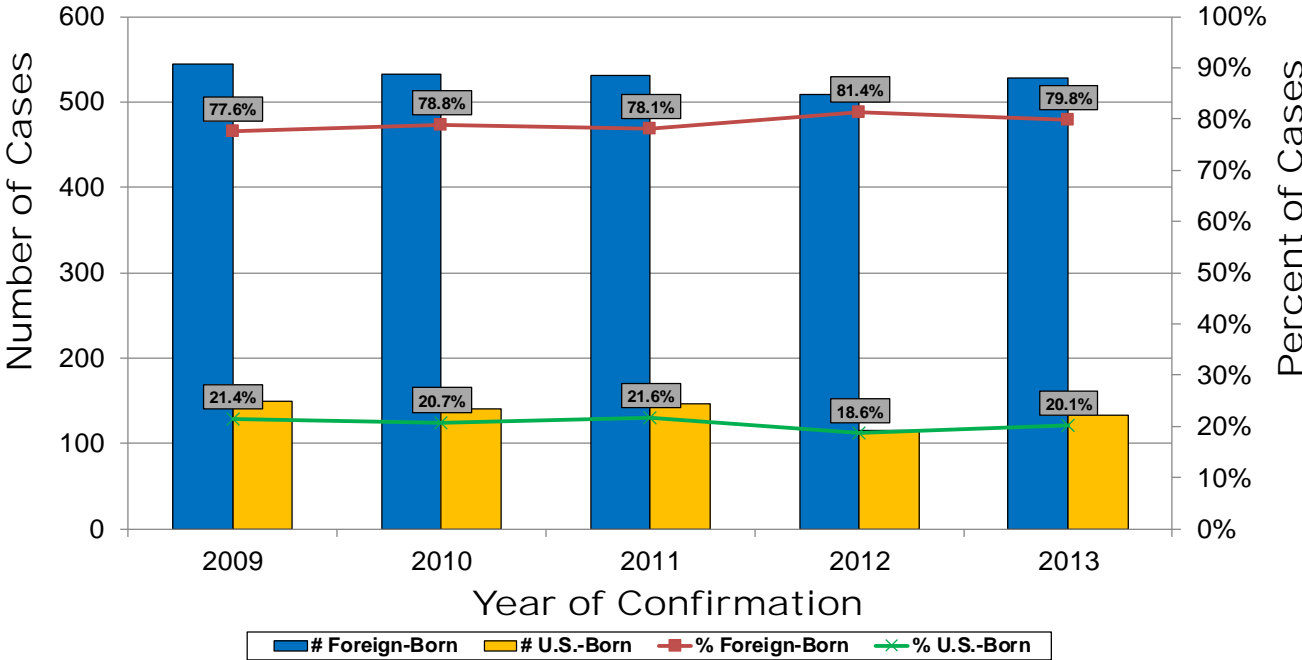
**Figure 8: Tuberculosis Case Rates by Sex: Los Angeles County, 2009-2013\***



\*Data exclude Long Beach and Pasadena TB cases.

◆ Female ■ Male ▲ Total

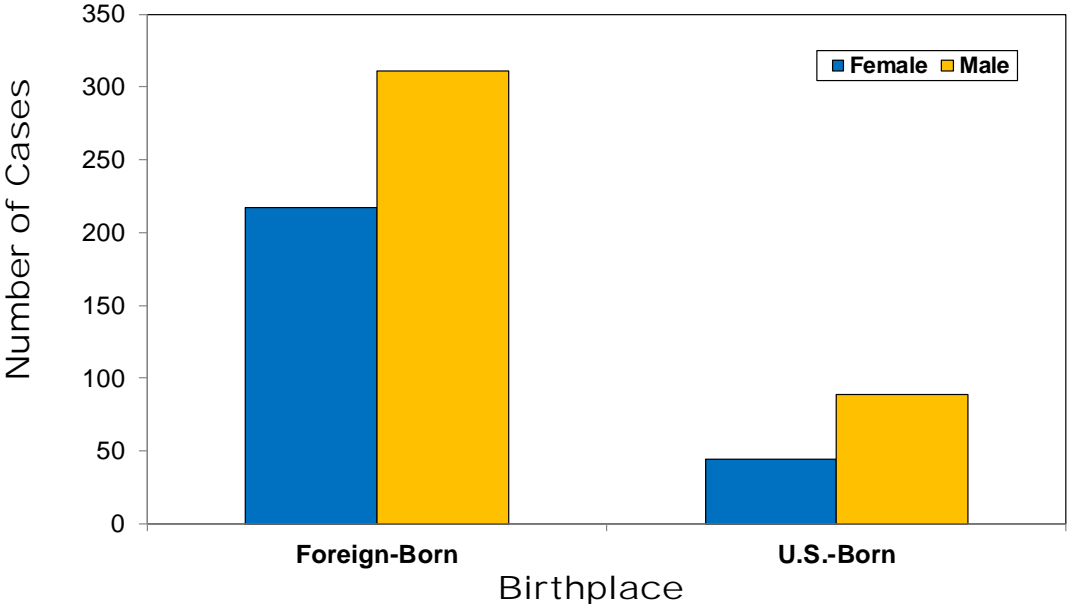
**Figure 9: Tuberculosis Cases by Nativity: Los Angeles County, 2009-2013\***



\*Includes only TB cases with known place of birth. Data excludes Long Beach and Pasadena TB cases.

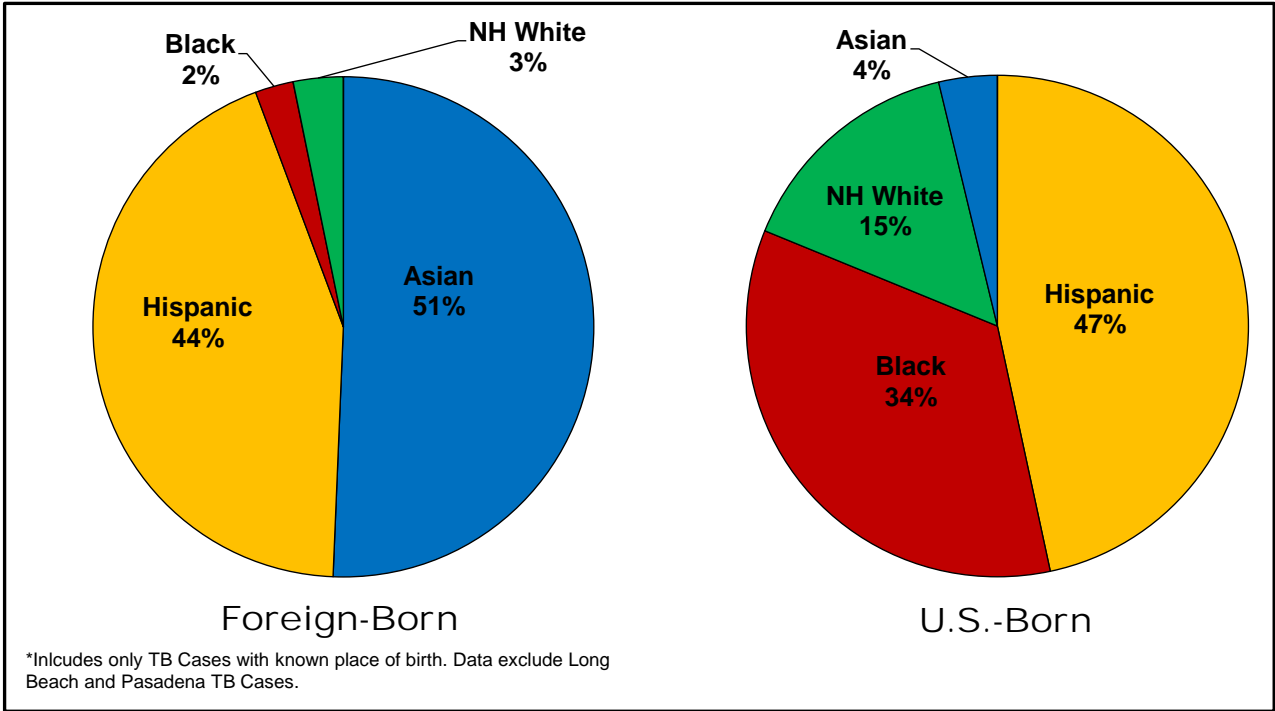
**In 2013, there were 4 times the number of TB cases among foreign-born individuals (n=558) than among U.S.-born (n=133) individuals.**

**Figure 10: Tuberculosis Cases by Nativity and Sex: Los Angeles County, 2013\***



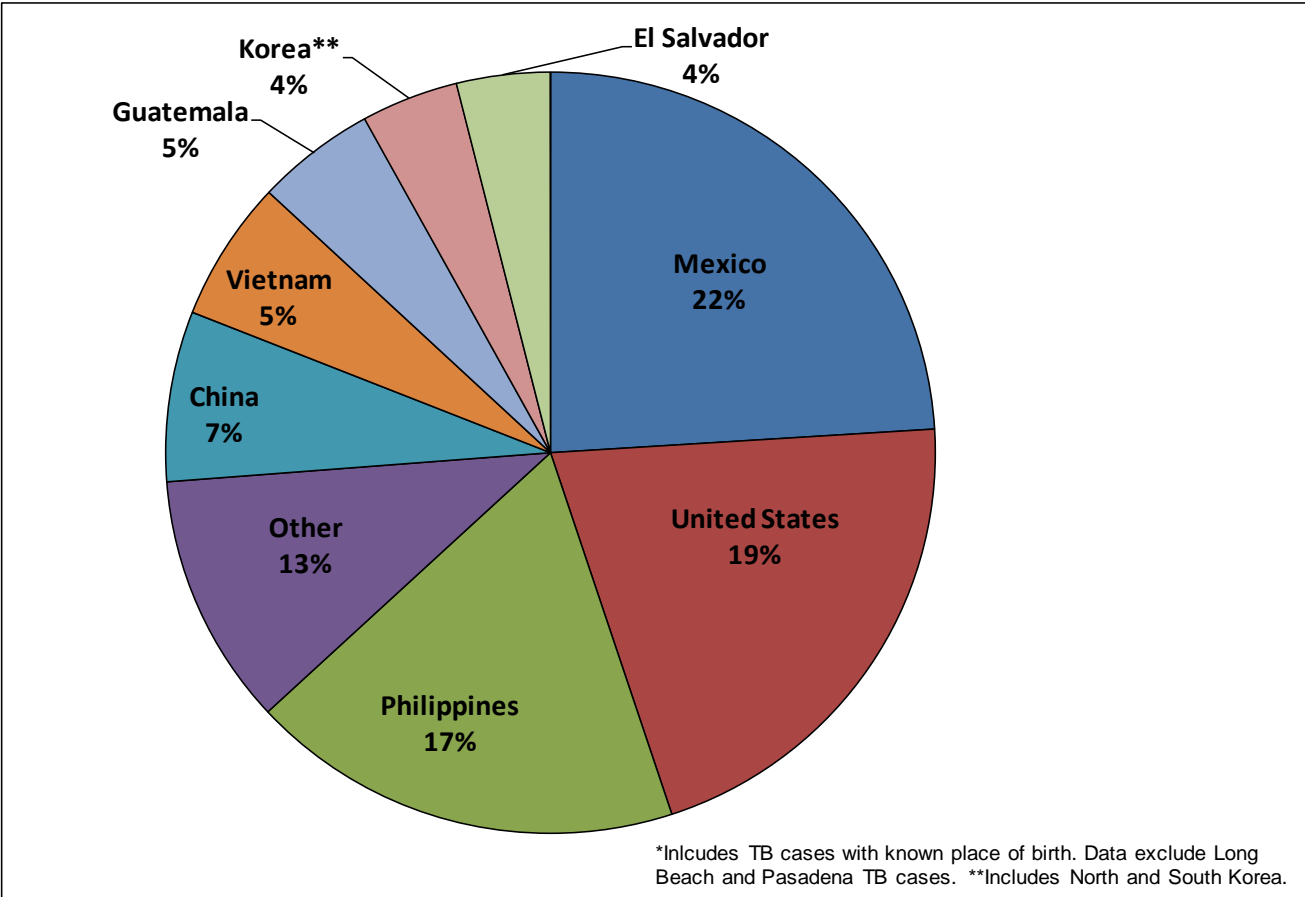
\*Includes only TB cases with known place of birth. Excludes Long Beach and Pasadena TB cases.

**Figure 11: Tuberculosis Cases by Nativity and Race/Ethnicity: Los Angeles County, 2013\***



\*Includes only TB Cases with known place of birth. Data exclude Long Beach and Pasadena TB Cases.

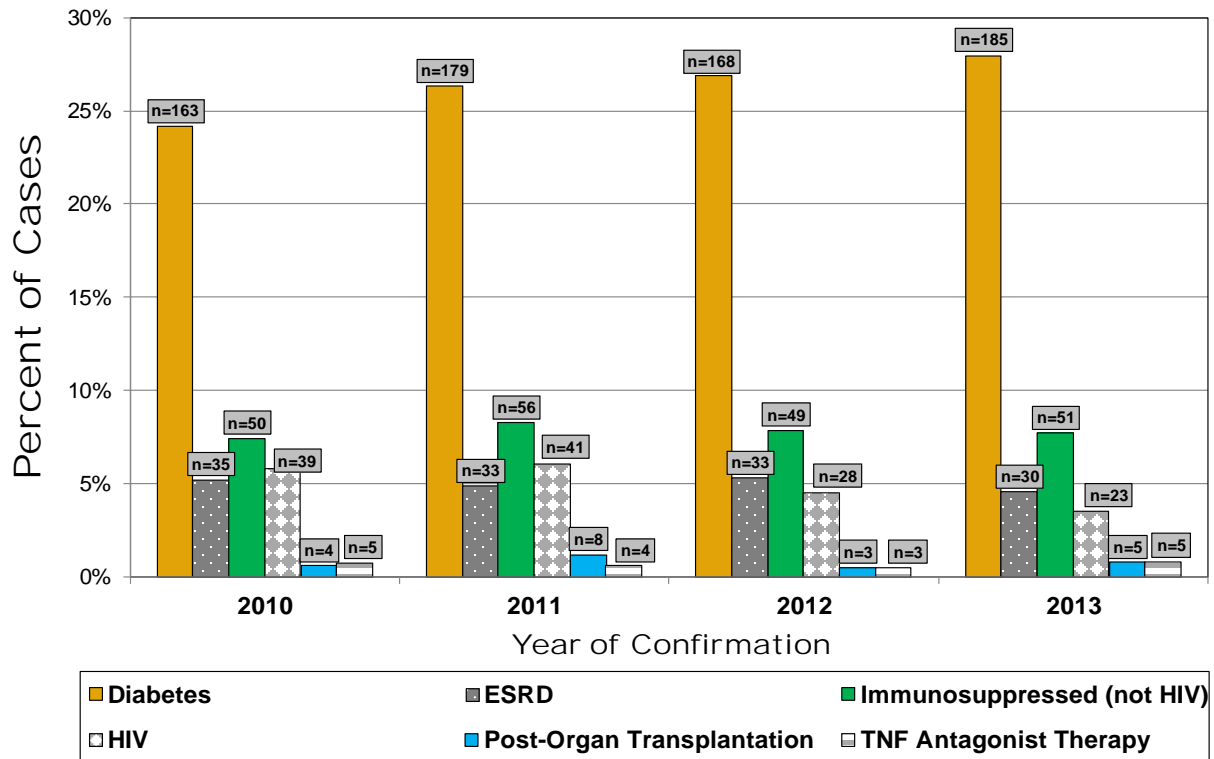
**Figure 12: Tuberculosis Cases by Country of Birth: Los Angeles County, 2013 (n=662)\***



**Close to two-thirds of foreign-born TB cases (66%) originated from 7 countries (Mexico, Philippines, China, Vietnam, Guatemala, Korea, and El Salvador).**



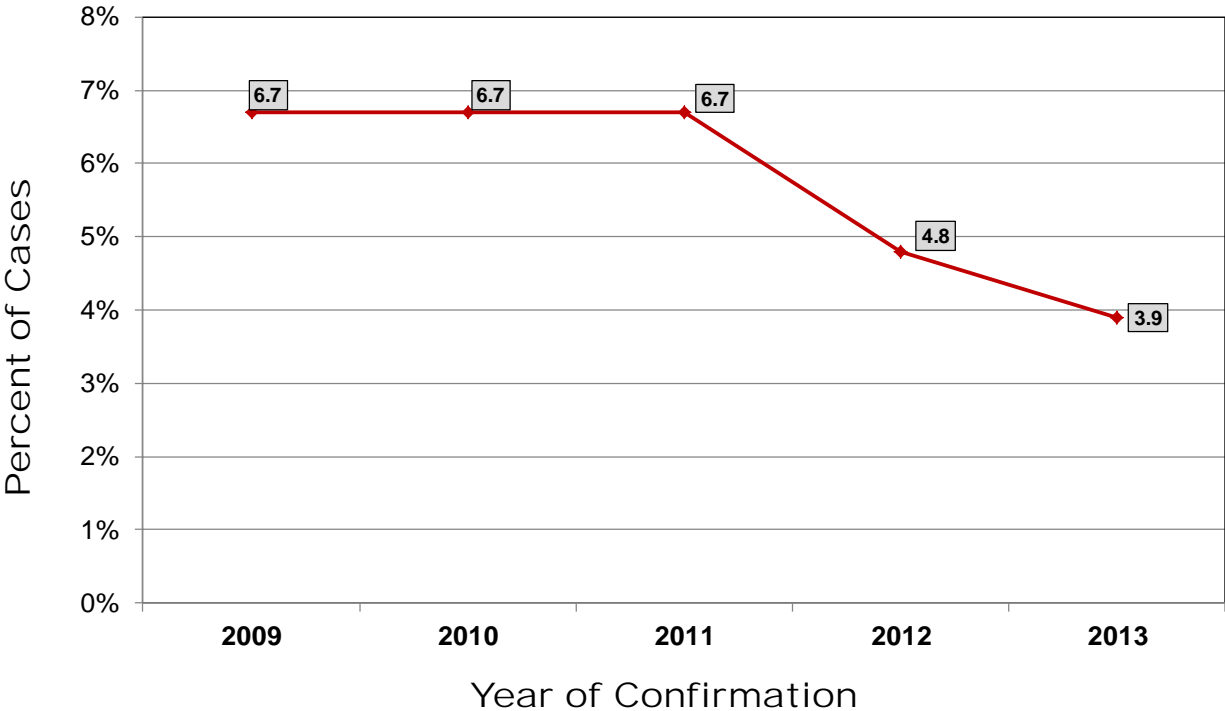
**Figure 13: Comorbidities among Tuberculosis Cases: Los Angeles County, 2010-2013\***



\*TB Cases can have more than one comorbidity. Data exclude Long Beach and Pasadena TB cases.

**In 2013, 38% of TB cases had one or more medical comorbidities, including diabetes mellitus, ESRD, post-organ transplantation, HIV, or another immunosuppressive condition. The most common comorbidity was diabetes mellitus (28% of cases). Comorbidities increase the risk of TB infection progressing to active TB disease.**

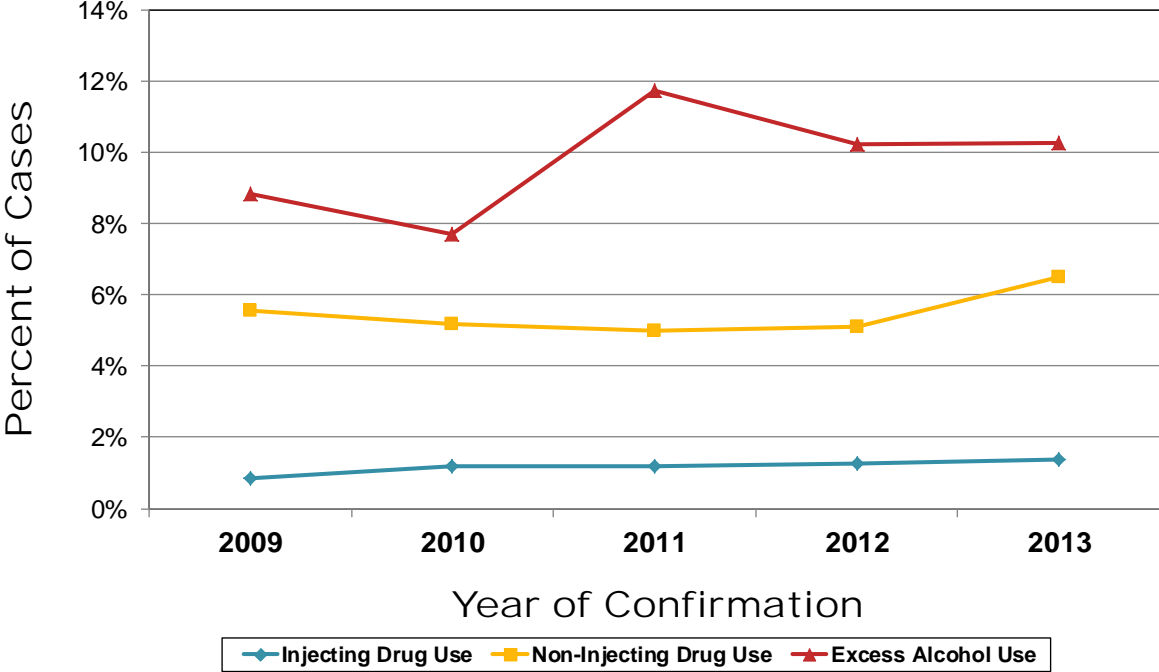
**Figure 14: HIV Co-Infected Tuberculosis Cases: Los Angeles County, 2009-2013\***



\*Data based on cases with known HIV status: 2009 n=584; 2010 n=583; 2011 n=610; 2012 n=578; 2013 n=593. Data exclude Long Beach and Pasadena TB cases.

**In 2013, there were 23 (3.9%) HIV co-infected TB cases reported in LA County. People living with HIV are at high risk for rapid progression to TB disease and are more likely to die during treatment.**

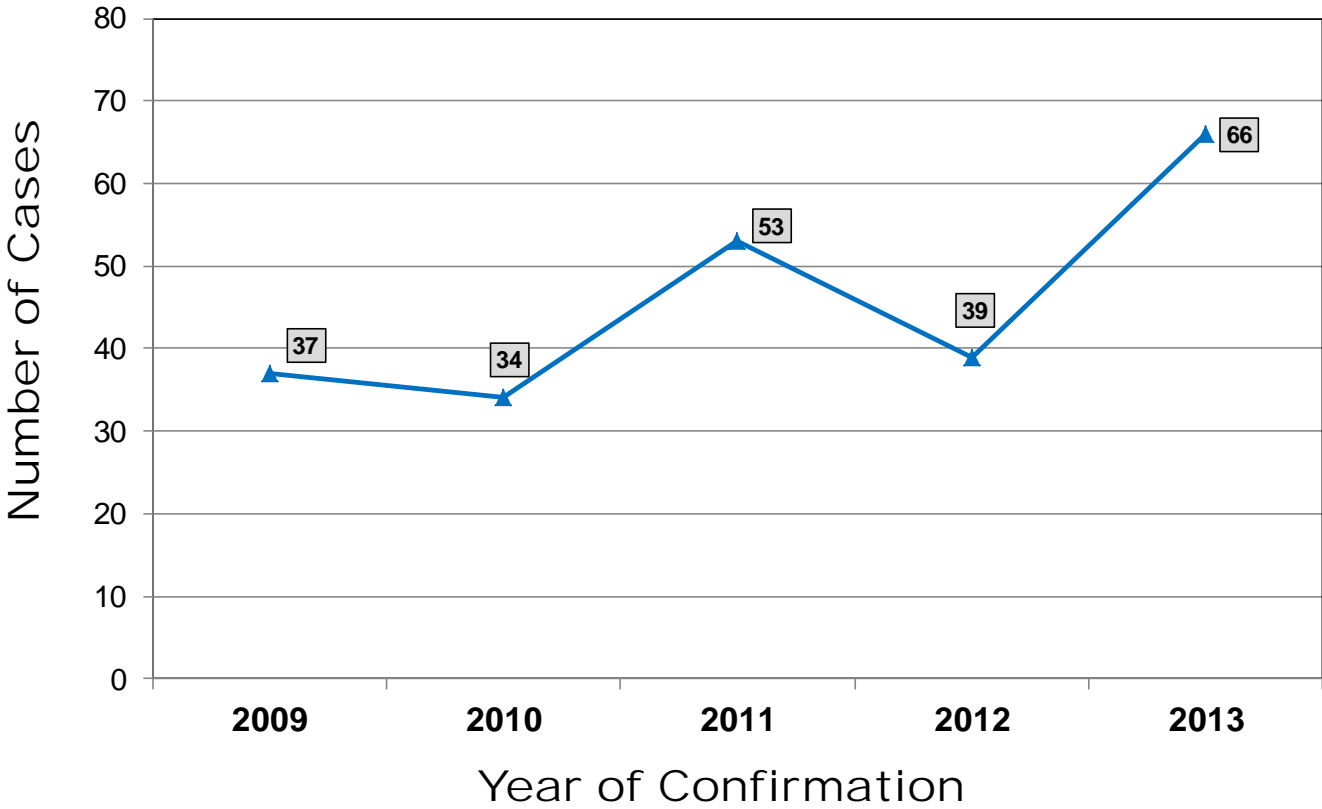
**Figure 15: Reported Substance Abuse among Tuberculosis Cases: Los Angeles County, 2009-2013\***



\*Drug or alcohol use within the past year. Data exclude Long Beach and Pasadena TB cases.

**In 2013, excess alcohol use (10%) was the most commonly reported type of substance abuse. In fact, excess alcohol use has been most commonly reported in the past 5 years. Substance abuse is a challenge to the control of TB because patients with substance abuse problems are less likely to begin and complete TB treatment.**

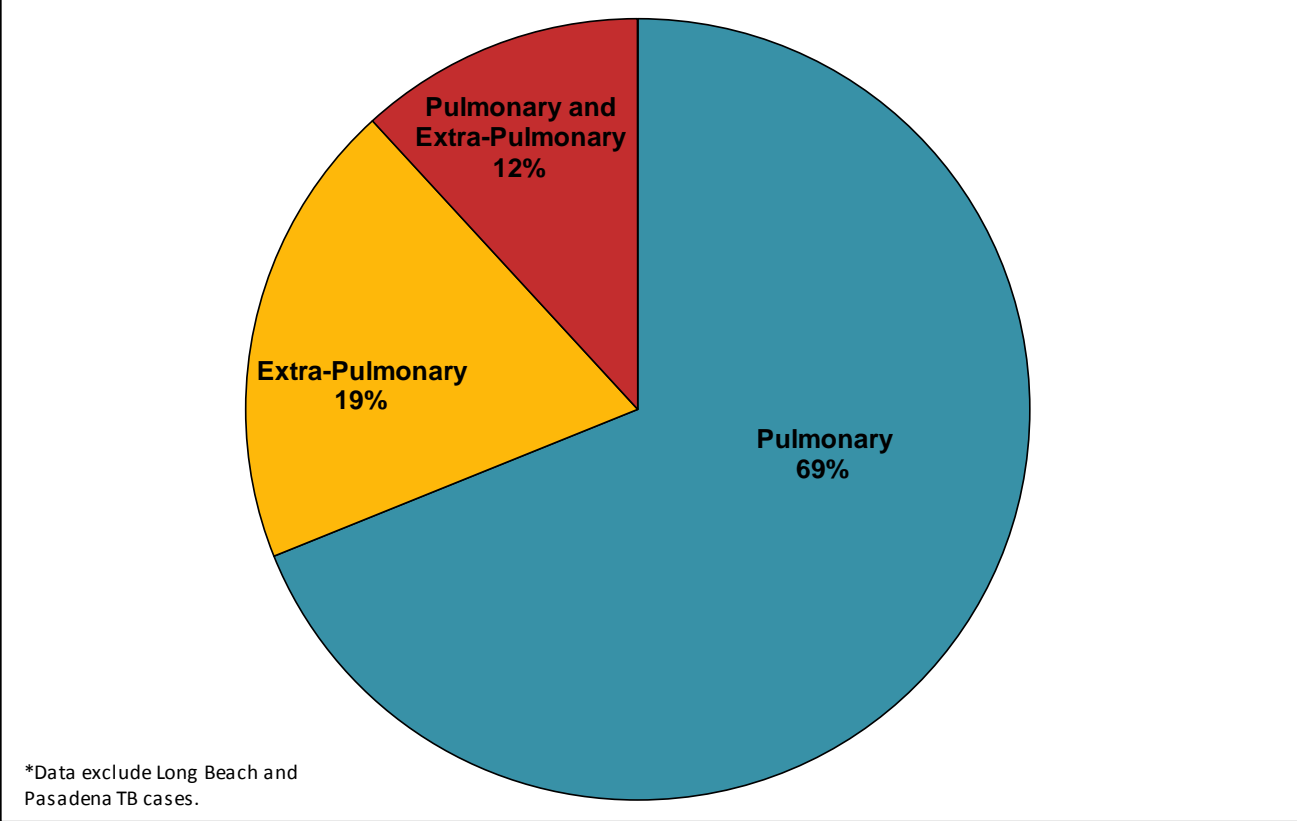
**Figure 16: Tuberculosis Cases Experiencing Homelessness: Los Angeles County, 2009-2013\***



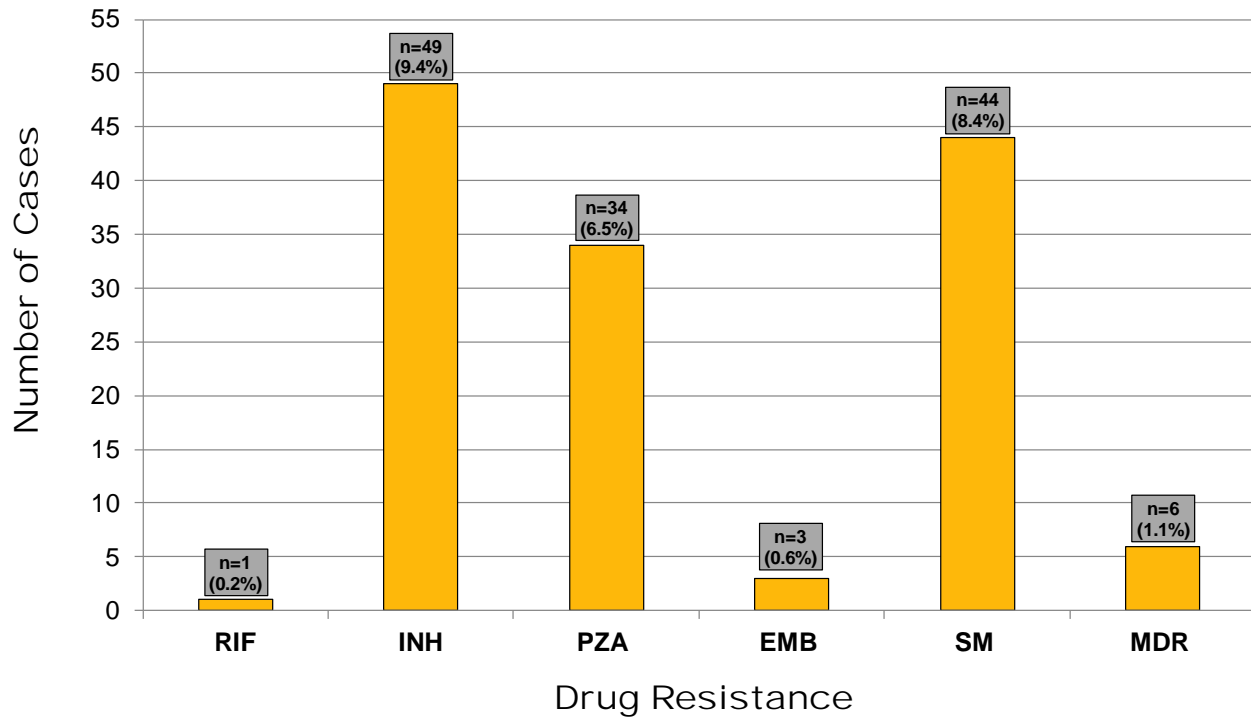
\*Homelessness within 1 year of TB diagnosis. Data exclude Long Beach and Pasadena TB cases.

**In 2013, there were 66 (10%) TB cases reported in LA County as having been homeless 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, 2013 (n=662)\***



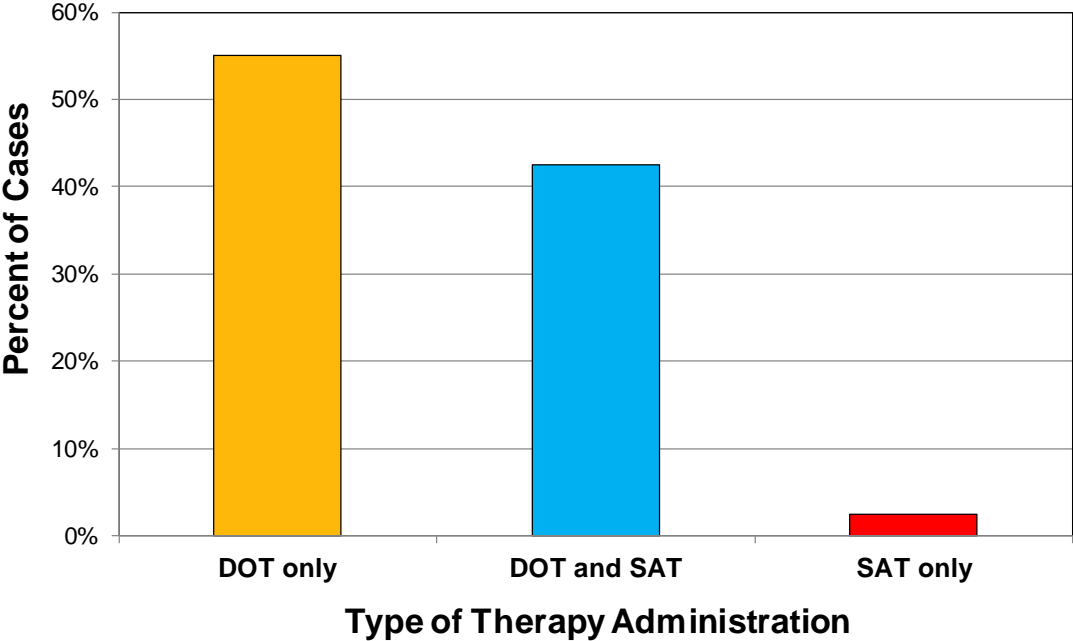
**Figure 18: Drug Resistance among Tuberculosis Cases: Los Angeles County, 2013\***



\*RIF=Rifampin; INH=Isoniazid; PZA=Pyrazinamide; EMB=Ethambutol; 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.

**Resistance to first-line TB drugs has remained fairly stable in the past 5 years. In 2013, multidrug resistance (MDR) was identified in 6 TB cases, 1 of which was an XDR (extensively drug resistant) TB case.**

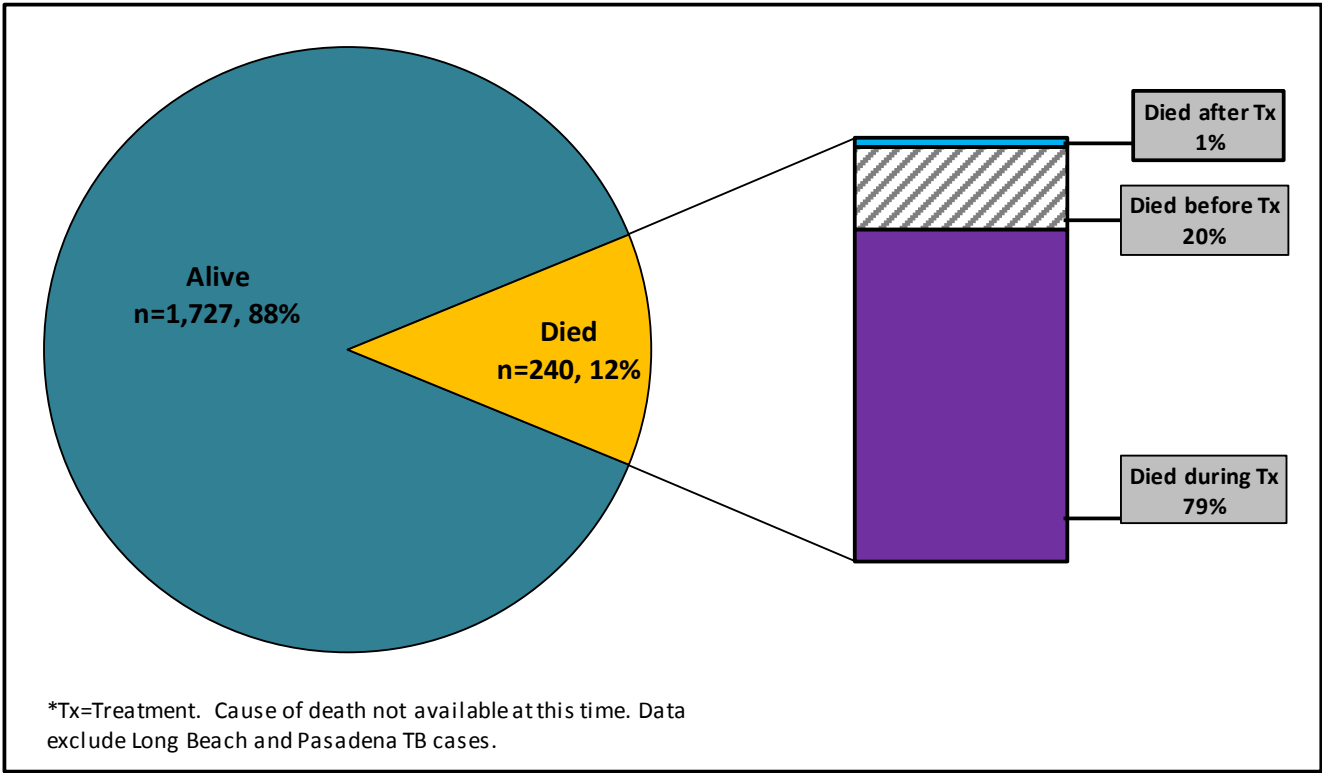
**Figure 19: Tuberculosis Cases by Therapy Administration: Los Angeles County, 2013\***



\*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.

**In 2013, 55% of TB cases were on DOT only, while 43% were on a combination of DOT and SAT. Since 2010, there has been a decline on the number of cases on DOT only and a steady increase of TB cases on a DOT and SAT combination.**

**Figure 20: Deaths among Tuberculosis Cases: Los Angeles County, 2011-2013 (n=240)\***





# Tables

**Table 1: Demographic Characteristics of Tuberculosis Cases: Los Angeles County, 2009-2013**

	Year of Confirmation										Percent Change*	
	2009		2010		2011		2012		2013		2009-2013	2012-2013
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%		
<b>Race/Ethnicity**</b>												
NH White	45	6.4	48	7.1	46	6.8	35	5.6	37	5.6	-17.8	5.7
Black	58	8.3	65	9.6	46	6.8	59	9.4	60	9.1	3.4	1.7
Hispanic	325	46.3	296	43.9	319	46.9	286	45.8	292	44.1	-10.2	2.1
Asian	273	38.9	266	39.4	268	39.4	245	39.2	272	41.1	-0.4	11.0
Other	1	0.1	0	0.0	1	0.1	0	0.0	1	0.2	-	-
<b>Age Group</b>												
0-4	14	2.0	15	2.2	29	4.3	9	1.4	18	2.7	28.6	100.0
5-14	14	2.0	12	1.8	12	1.8	4	0.6	7	1.1	-50.0	75.0
15-34	167	23.8	147	21.8	126	18.5	131	21.0	125	18.9	-25.1	-4.6
35-44	104	14.8	99	14.7	94	13.8	67	10.7	97	14.7	-6.7	44.8
45-54	113	16.1	121	17.9	122	17.9	97	15.5	97	14.7	-14.2	0.0
55-64	114	16.2	91	13.5	112	16.5	130	20.8	117	17.7	2.6	-10.0
65+	176	25.1	190	28.1	185	27.2	187	29.9	201	30.4	14.2	7.5
<b>Sex</b>												
Female	278	39.6	277	41.0	277	40.7	235	37.6	261	39.4	-6.1	11.1
Male	424	60.4	398	59.0	403	59.3	390	62.4	401	60.6	-5.4	2.8
<b>Nativity</b>												
Foreign-Born	545	77.6	532	78.8	531	78.1	509	81.4	528	79.8	-3.1	3.7
U.S.-Born	150	21.4	140	20.7	147	21.6	116	18.6	133	20.1	-11.3	14.7
Unknown	7	1.0	3	0.4	2	0.3	0	0.0	1	0.2	-	-
<b>Country of Birth</b>												
Mexico	181	25.8	170	25.2	166	24.4	169	27.0	153	23.1	-15.5	-9.5
United States	150	21.4	140	20.7	146	21.5	115	18.4	133	20.1	-11.3	15.7

	Year of Confirmation										Percent Change*	
	2009		2010		2011		2012		2013		2009-2013	2012-2013
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%		
<b>Philippines</b>	103	14.7	95	14.1	102	15.0	92	14.7	116	17.5	12.6	26.1
<b>China</b>	40	5.7	47	7.0	30	4.4	35	5.6	46	6.9	15.0	31.4
<b>Vietnam</b>	30	4.3	34	5.0	34	5.0	39	6.2	38	5.7	26.7	-2.6
<b>Guatemala</b>	40	5.7	25	3.7	28	4.1	25	4.0	32	4.8	-20.0	28.0
<b>Korea***</b>	39	5.6	27	4.0	38	5.6	32	5.1	26	3.9	-33.3	-18.8
<b>El Salvador</b>	19	2.7	18	2.7	35	5.1	28	4.5	25	3.7	31.6	-10.7
<b>Other</b>	91	13.0	112	16.6	97	14.3	87	13.9	90	13.6	-1.1	3.4
<b>Unknown</b>	9	1.3	7	1.0	4	0.6	3	0.4	3	0.4	-	-
<b>Total Cases</b>	702	100.0	675	100.0	680	100.0	625	100.0	662	100.0	-5.7	5.9

\*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 other/unknown case for years 2009 and 2013. \*\*\*Includes both North and South Korea. Data excludes Long Beach and Pasadena TB cases.

**Table 2. Tuberculosis Cases by Race/Ethnicity\* and Age Group: Los Angeles County, 2009-2013**

	Year of Confirmation									
	2009		2010		2011		2012		2013	
	Cases	%*	Cases	%*	Cases	%*	Cases	%*	Cases	%*
<b>NH White</b>										
<b>0-4</b>	0	0.0	1	2.1	1	2.2	0	0.0	0	0.0
<b>5-14</b>	1	2.2	1	2.1	0	0.0	0	0.0	0	0.0
<b>15-34</b>	7	15.6	10	20.8	1	2.2	3	8.6	2	5.4
<b>35-44</b>	6	13.3	5	10.4	7	15.2	2	5.7	5	13.5
<b>45-54</b>	4	8.9	8	16.7	12	26.1	10	28.6	11	29.7
<b>55-64</b>	12	26.7	7	14.6	5	10.9	5	14.3	8	21.6
<b>65+</b>	15	33.3	16	33.3	20	43.5	15	42.9	11	29.7
<b>Subtotal</b>	45	100.0	48	100.0	46	100.0	35	100.0	37	100.0
<b>Black</b>										
<b>0-4</b>	0	0.0	3	4.6	1	2.2	0	0.0	0	0.0
<b>5-14</b>	2	3.4	1	1.5	1	2.2	0	0.0	0	0.0
<b>15-34</b>	11	19.0	10	15.4	9	19.6	13	22.0	12	20.0
<b>35-44</b>	9	15.5	11	16.9	6	13.0	6	10.2	7	11.7
<b>45-54</b>	9	15.5	22	33.8	11	23.9	10	16.9	15	25.0
<b>55-64</b>	14	24.1	9	13.8	10	21.7	20	33.9	12	20.0
<b>65+</b>	13	22.4	9	13.8	8	17.4	10	16.9	14	23.3
<b>Subtotal</b>	58	100.0	65	100.0	46	100.0	59	100.0	60	100.0
<b>Hispanic</b>										
<b>0-4</b>	13	4.0	11	3.7	23	7.2	7	2.4	17	5.8
<b>5-14</b>	10	3.1	8	2.7	9	2.8	2	0.7	6	2.1
<b>15-34</b>	90	27.7	84	28.4	72	22.6	77	26.9	72	24.7
<b>35-44</b>	50	15.4	51	17.2	45	14.1	41	14.3	52	17.8
<b>45-54</b>	55	16.9	56	18.9	67	21.0	41	14.3	43	14.7
<b>55-64</b>	46	14.2	25	8.4	47	14.7	52	18.2	37	12.7
<b>65+</b>	61	18.8	61	20.6	56	17.6	66	23.1	65	22.3
<b>Subtotal</b>	325	100.0	296	100.0	319	100.0	286	100.0	292	100.0
<b>Asian</b>										
<b>0-4</b>	1	0.4	0	0.0	4	1.5	2	0.8	1	0.4
<b>5-14</b>	1	0.4	2	0.8	2	0.7	2	0.8	1	0.4
<b>15-34</b>	59	21.6	43	16.2	44	16.4	38	15.5	39	14.3
<b>35-44</b>	38	13.9	32	12.0	36	13.4	18	7.3	33	12.1
<b>45-54</b>	45	16.5	35	13.2	32	11.9	36	14.7	27	9.9
<b>55-64</b>	42	15.4	50	18.8	49	18.3	53	21.6	60	22.1

	Year of Confirmation									
	2009		2010		2011		2012		2013	
	Cases	%*	Cases	%*	Cases	%*	Cases	%*	Cases	%*
<b>65+</b>	87	31.9	104	39.1	101	37.7	96	39.2	111	40.8
<b>Subtotal</b>	273	100.0	266	100.0	268	100.0	245	100.0	272	100.0
<b>Total Cases</b>	702	100.0	675	100.0	680	100.0	625	100.0	662	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.

**Table 3. Tuberculosis Cases by Race/Ethnicity\* and Sex: Los Angeles County, 2009-2013**

	Year of Confirmation									
	2009		2010		2011		2012		2013	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
<b>NH White</b>										
Female	9	20.0	20	41.7	14	30.4	14	40.0	12	32.4
Male	36	80.0	28	58.3	32	69.6	21	60.0	25	67.6
<b>Subtotal</b>	<b>45</b>	<b>100.0</b>	<b>48</b>	<b>100.0</b>	<b>46</b>	<b>100.0</b>	<b>35</b>	<b>100.0</b>	<b>37</b>	<b>100.0</b>
<b>Black</b>										
Female	15	2.1	23	3.4	17	2.5	22	3.5	20	3.0
Male	43	6.1	42	6.2	29	4.3	37	5.9	40	6.0
<b>Subtotal</b>	<b>58</b>	<b>8.3</b>	<b>65</b>	<b>9.6</b>	<b>46</b>	<b>6.8</b>	<b>59</b>	<b>9.4</b>	<b>60</b>	<b>9.1</b>
<b>Hispanic</b>										
Female	136	41.8	121	40.9	121	37.9	105	36.7	113	38.7
Male	189	58.2	175	59.1	198	62.1	181	63.3	179	61.3
<b>Subtotal</b>	<b>325</b>	<b>100.0</b>	<b>296</b>	<b>100.0</b>	<b>319</b>	<b>100.0</b>	<b>286</b>	<b>100.0</b>	<b>292</b>	<b>100.0</b>
<b>Asian</b>										
Female	117	42.9	113	42.5	125	46.6	94	38.4	116	42.6
Male	156	57.1	153	57.5	143	53.4	151	61.6	156	57.4
<b>Subtotal</b>	<b>273</b>	<b>100.0</b>	<b>266</b>	<b>100.0</b>	<b>268</b>	<b>100.0</b>	<b>245</b>	<b>100.0</b>	<b>272</b>	<b>100.0</b>
<b>Total Cases</b>	<b>702</b>	<b>100.0</b>	<b>675</b>	<b>100.0</b>	<b>680</b>	<b>100.0</b>	<b>625</b>	<b>100.0</b>	<b>662</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.

**Table 4. Tuberculosis Cases by Race/Ethnicity\*, Sex, and Age Group: Los Angeles County, 2013**

	Age Group													
	0-4 Years		5-14 Years		15-34 Years		35-44 Years		45-54 Years		55-64 Years		65+ Years	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
<b>NH White</b>														
Female	0	0.0	0	0.0	1	50.0	2	40.0	2	18.2	1	12.5	6	54.5
Male	0	0.0	0	0.0	1	50.0	3	60.0	9	81.8	7	87.5	5	45.5
<b>Subtotal</b>	<b>0</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>	<b>2</b>	<b>100.0</b>	<b>5</b>	<b>100.0</b>	<b>11</b>	<b>100.0</b>	<b>8</b>	<b>100.0</b>	<b>11</b>	<b>100.0</b>
<b>Black</b>														
Female	0	0.0	0	0.0	4	33.3	2	28.6	4	26.7	4	33.3	6	42.9
Male	0	0.0	0	0.0	8	66.7	5	71.4	11	73.3	8	66.7	8	57.1
<b>Subtotal</b>	<b>0</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>	<b>12</b>	<b>100.0</b>	<b>7</b>	<b>100.0</b>	<b>15</b>	<b>100.0</b>	<b>12</b>	<b>100.0</b>	<b>14</b>	<b>100.0</b>
<b>Hispanic</b>														
Female	8	47.1	5	83.3	26	36.1	21	40.4	11	25.6	16	43.2	26	40.0
Male	9	52.9	1	16.7	46	63.9	31	59.6	32	74.4	21	56.8	39	60.0
<b>Subtotal</b>	<b>17</b>	<b>100.0</b>	<b>6</b>	<b>100.0</b>	<b>72</b>	<b>100.0</b>	<b>52</b>	<b>100.0</b>	<b>43</b>	<b>100.0</b>	<b>37</b>	<b>100.0</b>	<b>65</b>	<b>100.0</b>
<b>Asian</b>														
Female	0	0.0	0	0.0	21	53.8	17	51.5	16	59.3	25	41.7	37	33.3
Male	1	100.0	1	100.0	18	46.2	16	48.5	11	40.7	35	58.3	74	66.7
<b>Subtotal</b>	<b>1</b>	<b>100.0</b>	<b>1</b>	<b>100.0</b>	<b>39</b>	<b>100.0</b>	<b>33</b>	<b>100.0</b>	<b>27</b>	<b>100.0</b>	<b>60</b>	<b>100.0</b>	<b>111</b>	<b>100.0</b>
<b>Total Cases</b>	<b>18</b>	<b>100.0</b>	<b>7</b>	<b>100.0</b>	<b>125</b>	<b>100.0</b>	<b>97</b>	<b>100.0</b>	<b>97</b>	<b>100.0</b>	<b>117</b>	<b>100.0</b>	<b>201</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.

**Table 5. Foreign-born Tuberculosis Cases by Race/Ethnicity\* and Age Group: Los Angeles County, 2009-2013**

	Year of Confirmation									
	2009		2010		2011		2012		2013	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
<b>NH White</b>										
<b>0-4</b>	0	0.0	0	0.0	1	4.8	0	0.0	0	0.0
<b>5-14</b>	1	6.7	1	4.2	0	0.0	0	0.0	0	0.0
<b>15-34</b>	4	26.7	6	25.0	0	0.0	1	5.9	1	5.9
<b>35-44</b>	0	0.0	2	8.3	2	9.5	2	11.8	2	11.8
<b>45-54</b>	2	13.3	5	20.8	4	19.0	3	17.6	3	17.6
<b>55-64</b>	2	13.3	3	12.5	2	9.5	1	5.9	2	11.8
<b>65+</b>	6	40.0	7	29.2	12	57.1	10	58.8	9	52.9
<b>Subtotal</b>	15	100.0	24	100.0	21	100.0	17	100.0	17	100.0
<b>Black</b>										
<b>0-4</b>	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
<b>5-14</b>	1	8.3	0	0.0	0	0.0	0	0.0	0	0.0
<b>15-34</b>	3	25.0	8	47.1	2	22.2	5	29.4	5	38.5
<b>35-44</b>	2	16.7	3	17.6	3	33.3	4	23.5	4	30.8
<b>45-54</b>	0	0.0	4	23.5	1	11.1	2	11.8	2	15.4
<b>55-64</b>	1	8.3	1	5.9	3	33.3	3	17.6	1	7.7
<b>65+</b>	5	41.7	1	5.9	0	0.0	3	17.6	1	7.7
<b>Subtotal</b>	12	100.0	17	100.0	9	100.0	17	100.0	13	100.0
<b>Hispanic</b>										
<b>0-4</b>	0	0.0	0	0.0	2	0.8	0	0.0	2	0.9
<b>5-14</b>	2	0.8	2	0.9	0	0.0	0	0.0	2	0.9
<b>15-34</b>	61	23.7	54	23.3	48	19.7	54	22.7	46	20.0
<b>35-44</b>	51	19.8	42	18.1	42	17.2	34	14.3	43	18.7
<b>45-54</b>	40	15.6	57	24.6	55	22.5	37	15.5	37	16.1
<b>55-64</b>	46	17.9	23	9.9	46	18.9	54	22.7	35	15.2
<b>65+</b>	57	22.2	54	23.3	51	20.9	59	24.8	65	28.3
<b>Subtotal</b>	257	100.0	232	100.0	244	100.0	238	100.0	230	100.0
<b>Asian</b>										
<b>0-4</b>	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
<b>5-14</b>	1	0.4	0	0.0	0	0.0	2	0.8	0	0.0
<b>15-34</b>	46	17.6	37	14.3	40	15.6	32	13.5	36	13.5
<b>35-44</b>	41	15.7	33	12.7	33	12.8	18	7.6	35	13.1
<b>45-54</b>	43	16.5	29	11.2	34	13.2	34	14.3	24	9.0



	Year of Confirmation									
	2009		2010		2011		2012		2013	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
<b>55-64</b>	41	15.7	48	18.5	48	18.7	49	20.7	60	22.5
<b>65+</b>	89	34.1	112	43.2	102	39.7	102	43.0	112	41.9
<b>Subtotal</b>	261	100.0	259	100.0	257	100.0	237	100.0	267	100.0
<b>Total Cases</b>	545	100.0	532	100.0	531	100.0	509	100.0	528	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.

**Table 6. Tuberculosis Cases by Comorbidities\* and Reported Substance Abuse\*\*: Los Angeles County, 2009-2013**

	Year of Confirmation									
	2009		2010		2011		2012		2013	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
<b>Diabetes</b>	17	2.4	163	24.1	179	26.3	168	26.9	185	27.9
<b>ESRD</b>	2	0.3	35	5.2	33	4.9	33	5.3	30	4.5
<b>Immunosuppressed</b>	3	0.4	50	7.4	56	8.2	49	7.8	51	7.7
<b>HIV</b>	39	6.7	39	6.7	41	6.7	28	4.8	23	3.9
<b>Post-Organ Transplantation</b>	0	0.0	4	0.6	8	1.2	3	0.5	5	0.8
<b>TNF Antagonist Therapy</b>	0	0.0	5	0.7	4	0.6	3	0.5	5	0.8
<b>Injecting Drug Use</b>	6	0.9	8	1.2	8	1.2	8	1.3	9	1.4
<b>Non-Injecting Drug Use</b>	39	5.6	35	5.2	34	5.0	32	5.1	43	6.5
<b>Excess Alcohol Use</b>	62	8.8	52	7.7	80	11.8	64	10.2	68	10.3

\*TB cases can have more than one comorbidity. \*\*Drug or alcohol abuse in the past year. Data exclude Long Beach and Pasadena TB cases.

**Table 7. Demographic Characteristics of HIV Co-Infected Tuberculosis Cases: Los Angeles County, 2009-2013**

	Year of Confirmation									
	2009		2010**		2011		2012		2013	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
<b>Race/Ethnicity*</b>										
NH White	4	10.3	2	5.1	3	7.3	0	0.0	4	17.4
Black	6	15.4	10	25.6	10	24.4	6	21.4	7	30.4
Hispanic	25	64.1	25	64.1	27	65.9	19	67.9	11	47.8
Asian	4	10.3	2	5.1	1	2.3	3	10.7	1	4.3
<b>Age Group</b>										
15-34	14	35.9	10	25.6	10	24.4	3	10.7	6	26.1
35-44	10	25.6	13	33.3	9	22.0	10	35.7	6	26.1
45-54	9	23.1	11	28.2	17	41.5	6	21.4	6	26.1
55-64	3	7.7	3	7.7	5	12.2	7	25.0	3	13.0
65+	3	7.7	2	5.1	0	0.0	2	7.1	2	8.7
<b>Sex</b>										
Female	5	12.8	7	17.9	6	14.6	3	10.7	5	21.7
Male	34	87.2	32	82.1	35	85.4	25	89.3	18	78.3
<b>Nativity</b>										
Foreign-Born	26	66.7	28	71.8	30	73.2	20	71.4	13	56.5
U.S.-Born	13	33.3	10	25.6	11	26.8	8	28.6	10	43.5
<b>Injecting Drug Use***</b>										
Yes	0	0.0	0	0.0	1	2.4	0	0.0	2	8.7
No	35	89.7	38	97.4	37	90.2	25	89.3	20	87.0
Unknown	4	10.3	1	2.6	3	7.3	3	10.7	1	4.3
<b>Non-Injecting Drug Use***</b>										
Yes	6	15.4	3	7.7	8	19.5	6	21.4	3	13.0
No	30	76.9	35	89.7	30	73.2	21	75.0	19	82.6
Unknown	3	7.7	1	2.6	3	7.3	1	3.6	1	4.3
<b>Excess Alcohol Use***</b>										
Yes	3	7.7	1	2.6	14	34.1	6	21.4	3	13.0
No	34	87.2	35	89.7	24	58.5	21	75.0	19	82.6
Unknown	2	5.1	3	7.7	3	7.3	1	3.6	1	4.3
<b>Homelessness***</b>										
Yes	3	7.7	6	15.4	12	29.3	6	21.4	8	34.8
No	35	89.7	32	82.1	28	68.3	22	78.6	15	65.2
Unknown	1	2.6	1	2.6	1	2.4	0	0.0	0	0.0
<b>Total Cases</b>	<b>39</b>	<b>100.0</b>	<b>39</b>	<b>100.0</b>	<b>41</b>	<b>100.0</b>	<b>28</b>	<b>100.0</b>	<b>23</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. \*\*Total for 2010 excludes 1 case with unknown nativity status. \*\*\* Drug or alcohol abuse in the past year. Homelessness within 1 year of TB diagnosis. Data exclude Long Beach and Pasadena TB cases.

**Table 8. Demographic Characteristics of Tuberculosis Cases Experiencing Homelessness: Los Angeles County, 2009-2013**

	Year of Confirmation									
	2009		2010		2011		2012		2013	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
<b>Race/Ethnicity</b>										
NH White	6	16.2	3	8.8	3	5.7	2	5.1	6	9.1
Black	8	21.6	11	32.4	16	30.2	13	33.3	23	34.8
Hispanic	20	54.1	14	41.2	30	56.6	21	53.8	34	51.5
Asian	3	8.1	6	17.6	4	7.5	3	7.7	3	4.5
<b>Age Group</b>										
15-34	4	10.8	8	23.5	8	15.1	8	20.5	8	12.1
35-44	12	32.4	5	14.7	15	28.3	9	23.1	17	25.8
45-54	11	29.7	13	38.2	12	22.6	8	20.5	24	36.4
55-64	9	24.3	3	8.8	15	28.3	13	33.3	10	15.2
65+	1	2.7	5	14.7	3	5.7	1	2.6	7	10.6
<b>Sex</b>										
Female	5	13.5	2	5.9	7	13.2	4	10.3	8	12.1
Male	32	86.5	32	94.1	46	86.8	35	89.7	58	87.9
<b>Nativity</b>										
Foreign Born	19	51.4	18	52.9	26	49.1	18	46.2	30	45.5
U.S. Born	18	48.6	15	44.1	27	50.9	21	53.8	35	53.0
Unknown	0	0.0	1	2.9	0	0.0	0	0.0	1	1.5
<b>Injecting Drug</b>										
Yes	3	8.1	2	5.9	4	7.5	3	7.7	4	6.1
No	29	78.4	26	76.5	44	83.0	33	84.6	57	86.4
Unknown	5	13.5	6	17.6	5	9.4	3	7.7	5	7.6
<b>Non-Injecting Drug</b>										
Yes	8	21.6	6	17.6	16	30.2	12	30.8	19	28.8
No	26	70.3	23	67.6	32	60.4	23	59.0	42	63.6
Unknown	3	8.1	5	14.7	5	9.4	4	10.3	5	7.6
<b>Excess Alcohol</b>										
Yes	19	51.4	11	32.4	25	47.2	19	48.7	36	54.5
No	17	45.9	19	55.9	24	45.3	17	43.6	28	42.4
Unknown	1	2.7	4	11.8	4	7.5	3	7.7	2	3.0
<b>Total Cases</b>	<b>37</b>	<b>100.0</b>	<b>34</b>	<b>100.0</b>	<b>53</b>	<b>100.0</b>	<b>39</b>	<b>100.0</b>	<b>66</b>	<b>100.0</b>

\*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.

**Table 9. Tuberculosis Cases Experiencing Homelessness\* by Race/Ethnicity\*\* and Sex: Los Angeles County, 2009-2013**

	Year of Confirmation									
	2009		2010		2011		2012		2013	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
<b>NH White</b>										
Female	1	16.7	0	0.0	0	0.0	0	0.0	0	0.0
Male	5	83.3	3	100.0	3	100.0	2	100.0	6	100.0
<b>Subtotal</b>	<b>6</b>	<b>100.0</b>	<b>3</b>	<b>100.0</b>	<b>3</b>	<b>100.0</b>	<b>2</b>	<b>100.0</b>	<b>6</b>	<b>100.0</b>
<b>Black</b>										
Female	1	12.5	2	18.2	3	18.8	1	7.7	2	8.7
Male	7	87.5	9	81.8	13	81.3	12	92.3	21	91.3
<b>Subtotal</b>	<b>8</b>	<b>100.0</b>	<b>11</b>	<b>100.0</b>	<b>16</b>	<b>100.0</b>	<b>13</b>	<b>100.0</b>	<b>23</b>	<b>100.0</b>
<b>Hispanic</b>										
Female	3	15.0	0	0.0	3	10.0	3	14.3	5	14.7
Male	17	85.0	14	100.0	27	90.0	18	85.7	29	85.3
<b>Subtotal</b>	<b>20</b>	<b>100.0</b>	<b>14</b>	<b>100.0</b>	<b>30</b>	<b>100.0</b>	<b>21</b>	<b>100.0</b>	<b>34</b>	<b>100.0</b>
<b>Asian</b>										
Female	0	0.0	0	0.0	1	25.0	0	0.0	1	33.3
Male	3	100.0	6	100.0	3	75.0	3	100.0	2	66.7
<b>Subtotal</b>	<b>3</b>	<b>100.0</b>	<b>6</b>	<b>100.0</b>	<b>4</b>	<b>100.0</b>	<b>3</b>	<b>100.0</b>	<b>3</b>	<b>100.0</b>
<b>Total Cases</b>	<b>37</b>	<b>100.0</b>	<b>34</b>	<b>100.0</b>	<b>53</b>	<b>100.0</b>	<b>39</b>	<b>100.0</b>	<b>66</b>	<b>100.0</b>

\*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.

**Table 10. Tuberculosis Cases Experiencing Homelessness\* by Race/Ethnicity\*\* and Age Group: Los Angeles County, 2009-2013**

	Year of Confirmation									
	2009		2010		2011		2012		2013	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
<b>NH White</b>										
15-34	0	0.0	1	33.3	0	0.0	0	0.0	0	0.0
35-44	2	33.3	0	0.0	1	33.3	0	0.0	1	16.7
45-54	1	16.7	2	66.7	1	33.3	1	50.0	3	50.0
55-64	2	33.3	0	0.0	1	33.3	1	50.0	2	33.3
65+	1	16.7	0	0.0	0	0.0	0	0.0	0	0.0
<b>Subtotal</b>	<b>6</b>	<b>100.0</b>	<b>3</b>	<b>100.0</b>	<b>3</b>	<b>100.0</b>	<b>2</b>	<b>100.0</b>	<b>6</b>	<b>100.0</b>
<b>Black</b>										
15-34	0	0.0	1	9.1	1	6.3	4	30.8	3	13.0
35-44	5	62.5	1	9.1	4	25.0	2	15.4	3	13.0
45-54	1	12.5	6	54.5	5	31.3	1	7.7	9	39.1
55-64	2	25.0	0	0.0	5	31.3	5	38.5	4	17.4
65+	0	0.0	3	27.3	1	6.3	1	7.7	4	17.4
<b>Subtotal</b>	<b>8</b>	<b>100.0</b>	<b>11</b>	<b>100.0</b>	<b>16</b>	<b>100.0</b>	<b>13</b>	<b>100.0</b>	<b>23</b>	<b>100.0</b>
<b>Hispanic</b>										
15-34	3	15.0	4	28.6	6	20.0	4	19.0	4	11.8
35-44	5	25.0	3	21.4	8	26.7	7	33.3	12	35.3
45-54	8	40.0	3	21.4	6	20.0	5	23.8	11	32.4
55-64	4	20.0	3	21.4	8	26.7	5	23.8	4	11.8
65+	0	0.0	1	7.1	2	6.7	0	0.0	3	8.8
<b>Subtotal</b>	<b>20</b>	<b>100.0</b>	<b>14</b>	<b>100.0</b>	<b>30</b>	<b>100.0</b>	<b>21</b>	<b>100.0</b>	<b>34</b>	<b>100.0</b>
<b>Asian</b>										
15-34	1	33.3	2	33.3	1	25.0	0	0.0	1	33.3
35-44	0	0.0	1	16.7	2	50.0	0	0.0	1	33.3
45-54	1	33.3	2	33.3	0	0.0	1	33.3	1	33.3
55-64	1	33.3	0	0.0	1	25.0	2	66.7	0	0.0
65+	0	0.0	1	16.7	0	0.0	0	0.0	0	0.0
<b>Subtotal</b>	<b>3</b>	<b>100.0</b>	<b>6</b>	<b>100.0</b>	<b>4</b>	<b>100.0</b>	<b>3</b>	<b>100.0</b>	<b>3</b>	<b>100.0</b>
<b>Total Cases</b>	<b>37</b>	<b>100.0</b>	<b>34</b>	<b>100.0</b>	<b>53</b>	<b>100.0</b>	<b>39</b>	<b>100.0</b>	<b>66</b>	<b>100.0</b>

\*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.

**Table 11. Tuberculosis Cases Experiencing Homelessness\* by Race/Ethnicity\*\* and Reported Substance Abuse\*\*\*: LA County, 2009-2013**

	Year of Confirmation									
	2009		2010		2011		2012		2013	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
<b>NH White</b>										
<b>Injecting Drugs</b>										
Yes	1	16.7	1	33.3	0	0.0	0	0.0	0	0.0
No	5	83.3	1	33.3	3	100.0	2	100.0	5	83.3
Unknown	0	0.0	1	33.3	0	0.0	0	0.0	1	16.7
<b>Non-Injecting Drugs</b>										
Yes	2	33.3	1	33.3	0	0.0	0	0.0	1	16.7
No	4	66.7	1	33.3	3	100.0	2	100.0	4	66.7
Unknown	0	0.0	1	33.3	0	0.0	0	0.0	1	16.7
<b>Excess Alcohol</b>										
Yes	3	50.0	2	66.7	2	66.7	1	50.0	3	50.0
No	3	50.0	0	0.0	1	33.3	1	50.0	2	33.3
Unknown	0	0.0	1	33.3	0	0.0	0	0.0	1	16.7
<b>Subtotal</b>	<b>6</b>	<b>100.0</b>	<b>3</b>	<b>100.0</b>	<b>3</b>	<b>100.0</b>	<b>2</b>	<b>100.0</b>	<b>6</b>	<b>100.0</b>
<b>Black</b>										
<b>Injecting Drugs</b>										
Yes	0	0.0	0	0.0	0	0.0	0	0.0	2	8.7
No	7	87.5	10	90.9	15	93.8	10	76.9	20	87.0
Unknown	1	12.5	1	9.1	1	6.3	3	23.1	1	4.3
<b>Non-Injecting Drugs</b>										
Yes	3	37.5	3	27.3	9	56.3	6	46.2	7	30.4
No	4	50.0	7	63.6	6	37.5	4	30.8	15	65.2
Unknown	1	12.5	1	9.1	1	6.3	3	23.1	1	4.3
<b>Excess Alcohol</b>										
Yes	2	25.0	4	36.4	9	56.3	5	38.5	12	52.2
No	5	62.5	6	54.5	6	37.5	6	46.2	10	43.5
Unknown	1	12.5	1	9.1	1	6.3	2	15.4	1	4.3
<b>Subtotal</b>	<b>8</b>	<b>100.0</b>	<b>11</b>	<b>100.0</b>	<b>16</b>	<b>100.0</b>	<b>13</b>	<b>100.0</b>	<b>23</b>	<b>100.0</b>
<b>Hispanic</b>										
<b>Injecting Drugs</b>										
Yes	2	10.0	1	7.1	4	13.3	3	14.3	2	5.9
No	14	70.0	10	71.4	22	73.3	18	85.7	29	85.3
Unknown	4	20.0	3	21.4	4	13.3	0	0.0	3	8.8
<b>Non-Injecting Drugs</b>										
Yes	3	15.0	1	7.1	7	23.3	6	28.6	11	32.4
No	15	75.0	10	71.4	19	63.3	15	71.4	20	58.8
Unknown	2	10.0	3	21.4	4	13.3	0	0.0	3	8.8
<b>Excess Alcohol</b>										

	Year of Confirmation									
	2009		2010		2011		2012		2013	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
<b>Yes</b>	13	65.0	4	28.6	13	43.3	13	61.9	21	61.8
<b>No</b>	7	35.0	9	64.3	14	46.7	8	38.1	13	38.2
<b>Unknown</b>	0	0.0	1	7.1	3	10.0	0	0.0	0	0.0
<b>Subtotal</b>	20	100.0	14	100.0	30	100.0	21	100.0	34	100.0
<b>Asian</b>										
<b>Injecting Drugs</b>										
<b>Yes</b>	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
<b>No</b>	3	100.0	5	83.3	4	100.0	3	100.0	3	100.0
<b>Unknown</b>	0	0.0	1	16.7	0.0	0.0	0.0	0.0	0	0.0
<b>Non-Injecting Drugs</b>										
<b>Yes</b>	0	0.0	1	16.7	0	0.0	0	0.0	0	0.0
<b>No</b>	3	100.0	5	83.3	4	100.0	2	66.7	3	100.0
<b>Unknown</b>	0	0.0	0	0.0	0	0.0	1	33.3	0	0.0
<b>Excess Alcohol</b>										
<b>Yes</b>	1	33.3	1	16.7	1	25.0	0	0.0	0	0.0
<b>No</b>	2	66.7	4	66.7	3	75.0	2	66.7	3	100.0
<b>Unknown</b>	0	0.0	1	16.7	0	0.0	1	33.3	0	0.0
<b>Subtotal</b>	3	100.0	6	100.0	4	100.0	3	100.0	3	100.0
<b>Overall Total</b>	37	100.0	34	100.0	53	100.0	39	100.0	66	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 or alcohol abuse in the past year. Data exclude Long Beach and Pasadena TB cases.



**Table 12. Tuberculosis Cases Experiencing Homelessness\* by Race/Ethnicity\*\* and Nativity: Los Angeles County, 2009-2013**

	Year of Confirmation									
	2009		2010		2011		2012		2013	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
<b>NH White</b>										
Foreign Born	0	0.0	1	33.3	0	0.0	0	0.0	0	0.0
U.S. Born	6	100.0	2	66.7	3	100.0	2	100.0	6	100.0
Unknown	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
<b>Subtotal</b>	<b>6</b>	<b>100.0</b>	<b>3</b>	<b>100.0</b>	<b>3</b>	<b>100.0</b>	<b>2</b>	<b>100.0</b>	<b>6</b>	<b>100.0</b>
<b>Black</b>										
Foreign Born	0	0.0	2	18.2	0	0.0	0	0.0	1	4.3
U.S. Born	8	100.0	9	81.8	16	100.0	13	100.0	21	91.3
Unknown	0	0.0	0	0.0	0	0.0	0	0.0	1	4.3
<b>Subtotal</b>	<b>8</b>	<b>100.0</b>	<b>11</b>	<b>100.0</b>	<b>16</b>	<b>100.0</b>	<b>13</b>	<b>100.0</b>	<b>23</b>	<b>100.0</b>
<b>Hispanic</b>										
Foreign Born	17	85.0	10	71.4	22	73.3	15	71.4	26	76.5
U.S. Born	3	15.0	3	21.4	8	26.7	6	28.6	8	23.5
Unknown	0	0.0	1	7.1	0	0.0	0	0.0	0	0.0
<b>Subtotal</b>	<b>20</b>	<b>100.0</b>	<b>14</b>	<b>100.0</b>	<b>30</b>	<b>100.0</b>	<b>21</b>	<b>100.0</b>	<b>34</b>	<b>100.0</b>
<b>Asian</b>										
Foreign Born	2	66.7	5	83.3	4	100.0	3	100.0	3	100.0
U.S. Born	1	33.3	1	16.7	0	0.0	0	0.0	0	0.0
Unknown	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
<b>Subtotal</b>	<b>3</b>	<b>100.0</b>	<b>6</b>	<b>100.0</b>	<b>4</b>	<b>100.0</b>	<b>3</b>	<b>100.0</b>	<b>3</b>	<b>100.0</b>
<b>Total Cases</b>	<b>37</b>	<b>100.0</b>	<b>34</b>	<b>100.0</b>	<b>53</b>	<b>100.0</b>	<b>39</b>	<b>100.0</b>	<b>66</b>	<b>100.0</b>

\*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.

**Table 13. Tuberculosis Cases by Site of Disease: Los Angeles County, 2009-2013**

	Year of Confirmation									
	2009		2010		2011		2012		2013	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
<b>Pulmonary</b>	458	65.2	475	70.4	470	69.1	405	64.8	456	68.9
<b>Extra-pulmonary*</b>	183	26.1	137	20.3	135	19.9	147	23.5	128	19.3
<b>Both Pulmonary and Extra-pulmonary</b>	61	8.7	63	9.3	75	11.0	73	11.7	78	11.8
<b>Total Cases</b>	702	100.0	675	100.0	680	100.0	625	100.0	662	100.0

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

**Table 14. Tuberculosis Cases by Verification Criteria\*: Los Angeles County, 2010-2013**

	Year of Confirmation							
	2010		2011		2012		2013	
	Cases	%	Cases	%	Cases	%	Cases	%
<b>Laboratory Confirmation*</b>	579	85.8	565	83.0	532	85.1	557	84.2
<b>Clinical Confirmation</b>								
<b>Clinical Case</b>	95	14.0	89	13.1	81	13.0	88	13.3
<b>Provider Diagnosis</b>	1	0.2	26	3.9	12	2.0	17	2.5
<b>Total Cases</b>	675	100.0	680	100.0	625	100.0	662	100.0

\*Laboratory Confirmation includes TB cases classified as culture positive, NAAT positive, and smear positive. Data exclude Long Beach and Pasadena TB cases.

**Table 15. Tuberculosis Cases with Resistance to Rifampin: Los Angeles County, 2009-2013**

Year of Confirmation	Culture Positive Cases	No. with RIF Susceptibility Testing	Cases with Resistance to RIF*	
			Cases	%
2009	558	554	2	0.4
2010	529	523	1	0.2
2011	544	537	0	0.0
2012	508	501	2	0.4
2013	533	528	1	0.2

\*RIF=Rifampin; excludes MDR TB cases. Data exclude Long Beach and Pasadena TB cases.

**Table 16. Tuberculosis Cases with Resistance to Isoniazid: Los Angeles County, 2009-2013**

Year of Confirmation	Culture Positive Cases	No. with INH Susceptibility Testing	Cases with Resistance to INH*	
			Cases	%
2009	558	554	49	8.8
2010	529	523	50	9.5
2011	544	536	48	8.8
2012	508	500	35	6.9
2013	533	528	55	10.3

\*INH=Isoniazid; excludes MDR TB cases. Data exclude Long Beach and Pasadena TB cases.

**Table 17. Tuberculosis Cases with Resistance to Pyrazinamide: Los Angeles County, 2009-2013**

Year of Confirmation	Culture Positive Cases	No. with PZA Susceptibility Testing	Cases with Resistance to PZA*	
			Cases	%
2009	558	550	28	5.1
2010	529	521	29	5.6
2011	544	536	37	6.9
2012	508	498	25	5.0
2013	533	526	34	6.5

\*PZA=Pyrazinamide; excludes MDR TB cases. Data exclude Long Beach and Pasadena TB cases.

**Table 18. Tuberculosis Cases with Resistance to Ethambutol: Los Angeles County, 2009-2013**

Year of Confirmation	Culture Positive Cases	No. with EMB Susceptibility Testing	Cases with Resistance to EMB*	
			Cases	%
2009	558	554	4	0.7
2010	529	523	4	0.8
2011	544	537	5	0.9
2012	508	501	3	0.6
2013	533	528	3	0.6

\*EMB=Ethambutol; excludes MDR TB cases. Data exclude Long Beach and Pasadena TB cases.

**Table 19. Tuberculosis Cases with Resistance to Streptomycin: Los Angeles County, 2009-2013**

Year of Confirmation	Culture Positive Cases	No. with SM Susceptibility Testing	Cases with Resistance to SM*	
			Cases	%
2009	558	519	42	8.1
2010	529	502	35	7.0
2011	544	511	44	8.6
2012	508	483	40	8.3
2013	533	505	44	8.7

\*SM=Streptomycin; excludes MDR TB cases. Data exclude Long Beach and Pasadena TB cases.

**Table 20. Tuberculosis Cases with Multidrug Resistance: Los Angeles County, 2009-2013**

Year of Confirmation	Culture Positive Cases	No. with MDR Susceptibility Testing*	Cases with Multidrug Resistance**					
			MDR Only	%	Pre-XDR	%	XDR	%
2009	558	554	5	0.9	0	0.0	0	0.0
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

\*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.

**Table 21. Tuberculosis Cases by Initial Drug Regimen: Los Angeles County, 2009-2013**

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
2009	702	666	663	60.9	1.8	1.5	0.5	35.3
2010	675	648	645	65.7	0.9	1.9	0.2	31.3
2011	680	665	664	78.1	1.2	1.7	0.3	18.7
2012	625	600	598	86.6	2.2	1.7	0.2	9.3
2013	662	639	639	90.5	0.9	2.2	0.5	5.9

\*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.

**Table 22. Tuberculosis Cases by Type of Therapy Administration: Los Angeles County, 2010-2013**

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	446	69.3	107	16.6	91	14.1
2011	680	664	662	412	62.3	176	26.5	74	11.2
2012	625	598	565	333	58.9	189	33.5	43	7.6
2013	662	639	558	307	55.0	237	42.5	14	2.5

\*DOT= Directly observed therapy; SAT= Self-administered therapy. DOT only may include TB cases who are on SAT on weekends. Data exclude Long Beach and Pasadena TB cases.



**Table 23. Treatment Outcomes among Tuberculosis Cases for whom One Year or Less of Therapy was indicated: Los Angeles County, 2009-2012**

	Year of Confirmation							
	2009		2010		2011		2012	
	Cases	%	Cases	%	Cases	%	Cases	%
<b>Completed Tx ≤ 1 year</b>	470	80.8	486	83.2	487	85.9	454	89.7
<b>Completed Tx ≥ 1 year</b>	49	8.4	50	8.6	38	6.7	27	5.3

\*Completion of Treatment as reported to CDC. Tx=Treatment. Data exclude Long Beach and Pasadena TB cases.

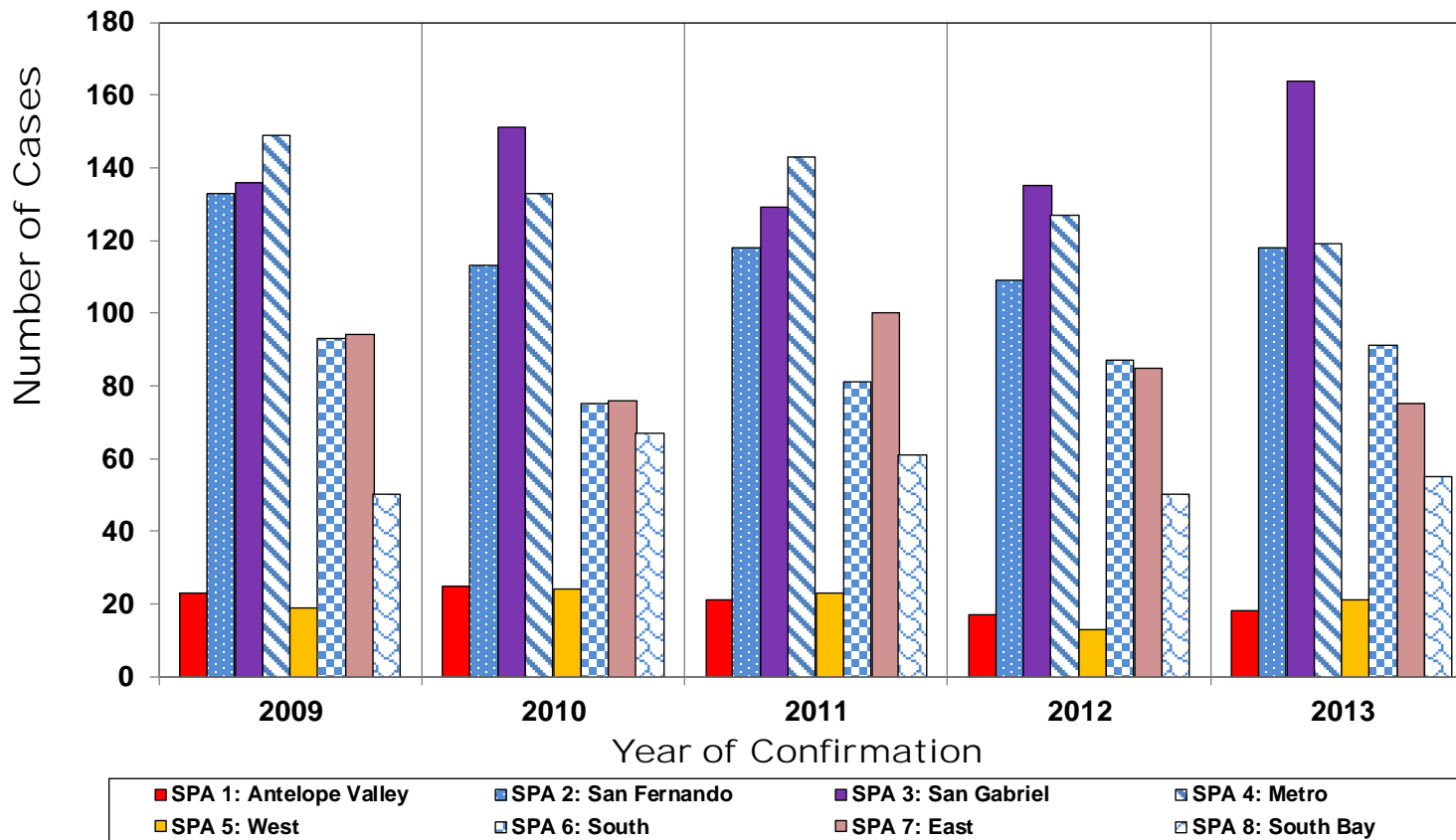
**Table 24. Deaths in Persons with Tuberculosis: Los Angeles County, 2009-2013**

Year of Confirmation	Timing of Death								
	Total Cases	Total Deaths		Died Before Starting TB Therapy		Died During TB Therapy		Died After Completing TB Therapy	
		Cases	%	Cases	%	Cases	%	Cases	%
2009	702	89	12.7	24	27.0	65	73.0	0	0.0
2010	675	69	10.2	20	29.0	48	69.6	1	1.4
2011	680	78	11.5	11	14.1	66	84.6	1	1.3
2012	625	79	12.6	17	21.5	62	78.5	0	0.0
2013	662	83	12.5	20	24.1	63	75.9	0	0.0

Data exclude Long Beach and Pasadena TB cases.

# **Tuberculosis Cases by Service Planning Area**

**Figure 21. TB Cases by Service Planning Area (SPA): Los Angeles County, 2009-2013**



Data exclude Long Beach and Pasadena TB cases.

**In 2013, a higher proportion of TB cases were reported by SPA 3 (25%), SPA 4 (18%), SPA 2 (18%), and SPA 6 (14%).**

**Table 25. Tuberculosis Cases by Service Planning Area (SPA): Los Angeles County, 2013**

	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	182	37	<5	13	6	<10	<5	<5	<5	<5
Black	137	60	5	<5	<5	13	<5	26	<5	<5
Hispanic	783	292	<5	49	44	54	<10	59	49	26
Asian	1,063	272	9	53	110	43	7	6	21	23
Other/Unknown	4	1	<5	<5	<5	<5	<5	<5	<5	<5
<b>Age Group</b>										
0-14	90	25	<5	5	<5	<5	<5	10	<5	<5
15-24	183	118	<5	8	<20	<20	<5	13	<5	<10
25-44	551	97	8	28	28	38	8	25	19	14
45-64	666	94	<5	40	57	36	<10	29	22	19
65+	678	208	5	37	66	34	5	14	25	14
<b>Sex</b>										
Female	848	261	9	43	71	38	9	41	30	20
Male	1,321	401	9	75	93	81	12	50	45	35
<b>Nativity</b>										
Foreign Born	1,695	528	<10	99	145	90	<20	51	63	47
U.S. Born	469	133	<10	19	19	28	<5	40	12	8
<b>Total Cases</b>	<b>2,169</b>	<b>662</b>	<b>18</b>	<b>118</b>	<b>164</b>	<b>119</b>	<b>21</b>	<b>91</b>	<b>75</b>	<b>55</b>

\*Report on Tuberculosis in California, 2013. CDPH, 2014. \*\*NH White = non-Hispanic White; Black = non-Hispanic Black; Hispanic = persons of Hispanic origin of any race; Asian = Asian/Pacific Islander. Unknown nativity status excluded due to small cell counts. <Suppression due to small cell count. Data exclude Long Beach and Pasadena TB cases.

**Table 26. Proportion of Tuberculosis Cases by Service Planning Area (SPA): Los Angeles County, 2013**

	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	8.4	5.6	--	11.0	3.7	--	--	--	--	--
Black	6.3	9.1	27.8	--	--	10.9	--	28.6	2.7	--
Hispanic	36.1	44.1	--	41.5	26.8	45.4	--	64.8	65.3	47.3
Asian	49.0	41.1	50.0	44.9	67.1	36.1	33.3	6.6	28.0	41.8
Other/Unknown	0.2	0.2	--	--	--	--	--	--	--	--
<b>Age Group</b>										
0-14	4.2	3.8	--	4.2	--	--	--	11.0	--	--
15-24	8.4	17.8	--	4.2	--	--	--	13.2	--	--
25-44	25.4	14.7	44.4	26.3	16.5	30.3	38.1	28.6	25.3	23.6
45-64	30.7	14.2	--	32.2	34.8	30.3	--	31.9	29.3	38.2
65+	31.3	31.4	27.8	33.1	41.5	30.3	23.8	15.4	34.7	25.5
<b>Sex</b>										
Female	39.1	39.4	50.0	36.4	43.3	31.9	42.9	45.1	40.0	36.4
Male	60.9	60.6	50.0	63.6	56.7	68.1	57.1	55.0	60.0	63.6
<b>Nativity</b>										
Foreign Born	78.1	79.8	--	83.9	88.4	75.6	--	56.0	84.0	85.5
U.S. Born	21.6	20.1	--	16.1	11.6	23.5	--	44.0	16.0	14.6
<b>Percent of Total</b>	-	-	2.7	17.8	24.8	18.0	3.2	13.7	11.3	8.3

\*Report on Tuberculosis in California, 2013. CDPH, 2014. \*\*NH White = non-Hispanic White; Black = non-Hispanic Black; Hispanic = persons of Hispanic origin of any race; Asian = Asian/Pacific Islander. Unknown nativity status excluded due to small cell counts. --Percent not calculated due to suppression of small cell counts. Data exclude Long Beach and Pasadena TB cases.

## 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>21</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, 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 TBI, 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 TBI<sup>3, 22</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>23</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. Data for 2013 are provisional and reflect the most complete information available as of December 31, 2014. Case count data may differ from previously published data and statistics due to updates in the TB surveillance database, and thus the counts presented in this report may not match TB counts previously released for a given year (the differences are generally very small). To protect the confidentiality of patients, small numbers have been suppressed in tables presenting data by SPA.
6. 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.
7. Age: Patient age was calculated by following Wang’s<sup>24</sup> 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, 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.

8. 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 foreign-born<sup>21</sup>.
9. Drug Susceptibility Testing (DST): DST is performed to help determine whether a person is sensitive or resistant to any TB drug(s). DST helps guide the selection of the most appropriate TB treatment regimen and when to consider drug resistance in patient management.
10. 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 2009-2012 in Table 26. 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.



## REFERENCES

1. U.S. Census Bureau. *State and County QuickFacts*. 2014; Available from: <http://quickfacts.census.gov/qfd/states/06/06037.html>.
2. Los Angeles County Department of Public Health, *County of Los Angeles Public Health Working for You: Annual Report, 2012-2013*, 2013, Department of Public Health Los Angeles.
3. Centers for Disease Control and Prevention Division of Tuberculosis Elimination, *Core Curriculum on Tuberculosis: What the Clinician Should Know. 6th Edition*, 2013.
4. Centers for Disease Control and Prevention Division of Tuberculosis Elimination, *Mycobacterium bovis (Bovine Tuberculosis) in Humans*, 2011: Available from <http://www.cdc.gov/tb/esp/publications/factsheets/general/mycobacterium.htm>.
5. Los Angeles County Department of Public Health Tuberculosis Control Program, *TB Infection: What you need to know to stay healthy*, 2014: Available from <http://publichealth.lacounty.gov/tb/public.htm>.
6. Centers for Disease Control and Prevention Division of Tuberculosis Elimination, *Latent Tuberculosis Infection: A Guide for Primary Health Care Providers*, 2013.
7. World Health Organization, *Media Centre: Tuberculosis Fact Sheet No. 104*, 2014: Available from <http://www.who.int/mediacentre/factsheets/fs104/en/#>.
8. Los Angeles County Department of Public Health Office of Health Assessment and Epidemiology, *Trends in Diabetes, Time for Action*. 2012.
9. Los Angeles County Department of Public Health Office of Health Assessment and Epidemiology, *Key Indicators of Health by Service Planning Area*, 2013.
10. California Department of Public Health Tuberculosis Control Branch, *Report on Tuberculosis in California, 2013*, 2014: Richmond, CA.
11. Centers for Disease Control and Prevention Division of Tuberculosis Elimination, *TB Incidence in the United States, 1953-2013*, 2014: Atlanta, GA.
12. Ortman, J., V. Velkoff, and H. Hogan, *An aging nation: The older population in the United States. Current Population Reports, P25-1140.* , 2014, U.S. Census Bureau: Washington, DC.
13. Federal Interagency Forum on Aging-Related Statistics, *Older Americans 2012: Key Indicators of Well-Being*, 2012: Washington, DC.
14. Kim, S., et al., *Treatment Response and Adverse Reactions in Older Tuberculosis Patients with Immunocompromising Comorbidities*. *Yonsei Med J*, 2013. **54**(5): p. 1227-1233.
15. Lin, C., et al., *Tuberculosis mortality: Patient characteristics and causes*. *BMC Infectious Diseases*, 2014. **14**(5).
16. Oeltmann, J., et al., *Tuberculosis and Substance Abuse in the United States, 1997-2006*. *Arch Intern Med*, 2009. **169**(2): p. 189-197.
17. World Health Organization, *Global Tuberculosis Report 2014*, 2014.
18. World Health Organization, *Drug-Resistant TB Surveillance & Response: Supplement Global Tuberculosis Report 2014*. 2014.
19. Marks, S., et al., *Treatment Practices, Outcomes, and Costs of Multidrug Resistant and Extensively Drug Resistant Tuberculosis in the United States, 2005-2007*. *Emerging Infectious Disease*, 2014. **20**(5): p. 812-821.
20. California Department of Health Services and California Tuberculosis Controllers Association, *CDPH/CTCA Joint Guidelines: Guidelines for the Follow-up and Assessment of Persons with Class A/B Tuberculosis, Revised 2011*.
21. Centers for Disease Control and Prevention Division of Tuberculosis Elimination, *Report of Verified Case of Tuberculosis (RVCT): Self-Study Modules Participant Manual.*, 2009.
22. Mazurek, M., et al., *Updated guidelines for using interferon gamma release assays to detect Mycobacterium tuberculosis infection-United States, 2010* *MMWR*, 2010. **59**(RR-5): p. 1-25.

23. Internal Services Department Social Services Systems Division, *2013 Population Estimates, prepared for County of Los Angeles*, 2013.
24. Wang, W. *Calculating Age in One Line of Code*. in *Northeast SAS Users Group Meeting*. 2001. Baltimore, MD. Available from <http://www.nesug.org/Proceedings/nesug01/cc/cc4022.pdf>.

# Tuberculosis Control Program

## VISION

TB is eliminated from Los Angeles County

## MISSION

To prevent the transmission of TB  
within Los Angeles County

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)

