



Epidemiology
of

Tuberculosis

in Sonoma County

2004 Annual Report

prepared by

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Executive Summary

The rate of tuberculosis (TB) in California is regularly above the national average of 5.1 cases per 100,000 persons and, in 2003, had the 2nd highest rate of TB in the nation at 8.9 cases per 100,000 persons.¹ Sonoma County was ranked 34 among counties in California with a rate of 3.3 new cases per 100,000 persons in 2003.²

People at higher risk for tuberculosis include immigrants from parts of the world where TB is still widespread, people with HIV infections, the homeless, the elderly and close contacts of people with infectious TB.

Of particular concern in Sonoma County:

Overall

- An increase in the number and rate of TB cases, rising from 3.3 in 2003 to 4.4 cases per 100,000 persons in 2004.^{3,4}
- Of the 21 cases diagnosed in 2004, 71% (N=15) were pulmonary and 62% (N=13) were culture confirmed.

Age

- An increase in the rate over time among persons 25 to 44 years old, rising from 1.5 to 9.4 cases per 100,000 population between 2000 and 2004.
- Two cases of TB were reported in children <5 years old in 2004.

Race/Ethnicity

- An increase in the rate of TB among Hispanic persons.
- Consistently high rates of TB among Asians.
- Foreign-born persons account for a high proportion of new TB cases.

Drug Resistance

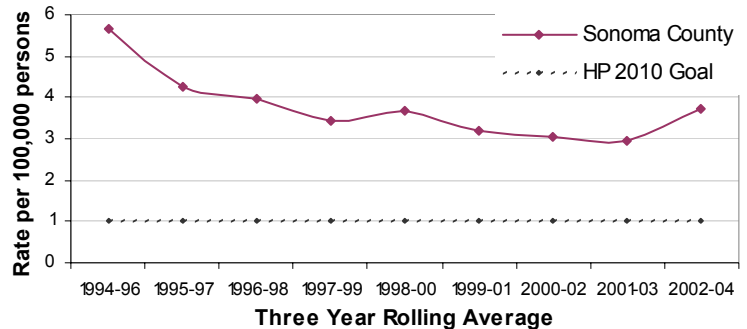
- Continuing increases over time in the proportion of TB isolates that are resistant to one or more drugs.

RATES AND DEMOGRAPHICS

In 2004, the rate of new cases increased to 4.4 cases per 100,000 persons (N=21). This represents a 38% increase over 2003 and is the highest rate reported since 1996, when 24 cases were reported at a rate of 5.6 cases per 100,000 persons. When evaluated over time, it appears that the rate of disease leveled off between 2000 and 2003 and may be increasing in 2004 (Figure 1).

With the 2004 rate of 4.4 cases per 100,000 persons, Sonoma County no longer meets the national definition for a low-incidence jurisdiction (<3.5 cases per 100,000 persons).⁶ In addition, the rate of TB infection in Sonoma County is not approaching the Healthy People 2010 goal of 1.0 case per 100,000 population.⁷

Figure 1 – Rate* of TB Infection, Three-year Rolling Average, Sonoma County 1994-2004⁵



*Rates per 100,000 population
Sources: State of California, Department of Health Services, Tuberculosis Control Branch

Age

Because the absolute number of cases is small, it is difficult to evaluate changing trends in age groups. Despite this, the rate of TB has clearly increased over time in persons 25 to 44 years old, rising from 1.5 to 9.4 cases per 100,000 population between 2000 and 2004 (Table 1). Although not a trend, an issue of particular concern is the two cases of pediatric TB in children 0-4 years old in 2004. Infection in a child is indicative of recent transmission and a possible missed opportunity for intervention.

Table 1 – Age-specific Rates* of Tuberculosis, Sonoma County 2000-2004

	2000			2001			2002			2003			2004		
	N	%	Rate	N	%	Rate	N	%	Rate	N	%	Rate	N	%	Rate
Total	16		3.5	10		2.1	17		3.6	15		3.2	21		4.4
Age Group															
0-4	1	(6.2)	3.6	0	(0.0)	0.0	1	(5.9)	3.6	0	(0.0)	0.0	2	(9.5)	7.2
5-14	0	(0.0)	0.0	0	(0.0)	0.0	0	(0.0)	0.0	1	(6.7)	1.6	0	(0.0)	0.0
15-24	1	(6.2)	1.6	1	(10.0)	1.6	7	(41.1)	10.9	3	(20.0)	4.5	0	(0.0)	0.0
25-44	2	(12.6)	1.5	4	(40.0)	3.0	5	(29.4)	3.9	7	(46.6)	4.5	12	(57.1)	9.4
45-64	4	(25.0)	3.5	3	(30.0)	2.5	2	(11.8)	1.6	3	(20.0)	2.3	4	(19.1)	3.0
65+	8	(50.0)	13.6	2	(20.0)	3.3	2	(11.8)	3.3	1	(6.7)	1.7	3	(14.3)	4.8

*Rates per 100,000 population
Source: State of California, Department of Health Services, Tuberculosis Control Branch

Race/Ethnicity

A variety of factors contribute to the disparity in the burden of tuberculosis among non-white persons. Persons who are Asian or report Hispanic ethnicity not only have a much higher rate of disease (50 and 9 cases per 100,000 persons, respectively, Table 2). These groups account for a higher proportion of TB cases than expected. In 2004, 38% of TB cases reported Hispanic ethnicity and 43% reported Asian race. Compared to the 2004 Sonoma County population, where 19% are Hispanic and 4% are Asian, these two groups are clearly more affected by TB.

Table 2 - Race-specific Rates* of Tuberculosis, Sonoma County 2004

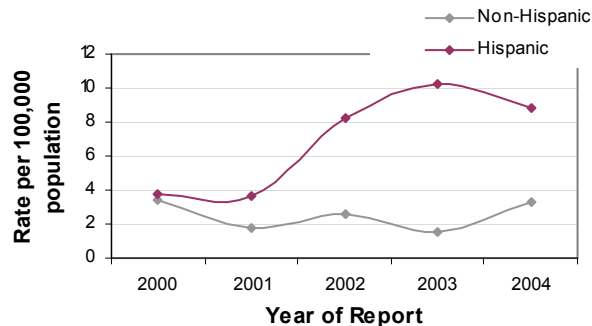
	Tuberculosis			Population	
	Case	Percent	Rate	Number	Percent
County Total	21	100%	4.4	479,824	100%
White	4	19%	1.2	348,828	73%
Hispanic	8	38%	8.9	90,287	19%
Asian/Pacific Islander	9	43%	50.0	17,998	4%
African American	0	0%	0.0	7,075	2%
American Indian/Alaska Native	0	0%	0.0	4,818	1%

*Rates per 100,000 population

Source: State of California, Department of Health Services, TB Control Branch

While the rate of TB among Asians has remained consistently high in the past five years (2000-2004 average, 28 cases per 100,000 persons), the rate in persons reporting Hispanic ethnicity has dramatically increased from 3.7 to 8.9 cases per 100,000 persons during the same time period (Figure 2).

Figure 2 – Rates* of TB by Ethnicity, Sonoma County 2000-2004



*Rates per 100,000 population

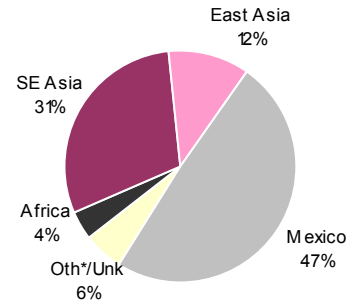
Source: State of California, Department of Health Services, TB Control Branch

Birth Country

Over the past ten years, an average of 67% of Sonoma County's TB cases occurred in foreign-born individuals (range 58-76%).

In California in 2003, 75% of all reported tuberculosis cases occurred in persons born outside of the United States, compared to 53% of cases nationally.^{8,9} In Sonoma County in 2003, 67% of persons with TB were foreign-born. Shown in Figure 3, between 2000 and 2004, the most common country of origin reported was Mexico, (N=25, 47%), followed by countries in South-east Asia (N=16, 31%) and East Asia (N=6, 12%).

Figure 3 – Country of Origin of Foreign-born TB cases, Sonoma County 2000-2004 (N=52)



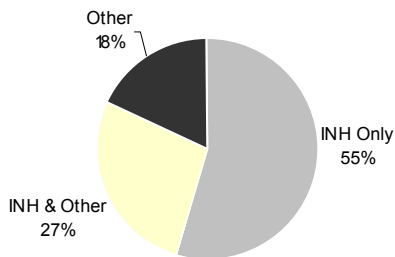
*Oth/Unk includes one case each from Haiti, India, and one not specified.
 Source: State of California, Department of Health Services, TB Control Branch

DRUG RESISTANCE

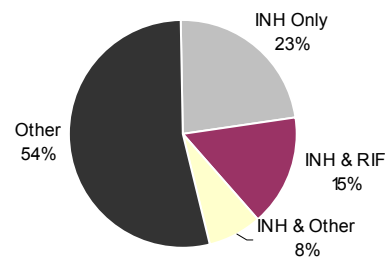
Single and multiple drug-resistant TB strains continue to be an emerging problem in Sonoma County. In recent years, the proportion of cases with TB resistant to one or more drugs has increased from 19% between 1995 and 1999, to 23% between 2000 and 2004. In addition, the proportion of isolates resistant to 2 or more drugs has increased from 4% between 1995 and 1999 to 6% between 2000 and 2004 (Figure 4). There have been three multi-drug resistant cases (isolates resistant to Isoniazid and Rifampin) in Sonoma County, one each in 1994, 2002, and 2003.

Figure 4 – Distribution of Antibiotic Resistance among Resistant TB isolates, Sonoma County

1995-1999 (N=11)



2000-2004 (N=13)



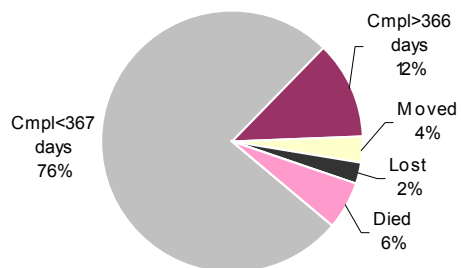
Source: State of California, Department of Health Services, TB Control Branch

TREATMENT OUTCOMES

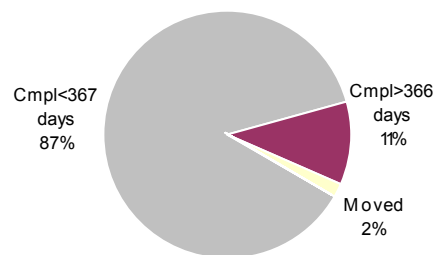
Sonoma County continues to improve the proportion of persons completing therapy in less than one year, increasing from 76% of persons between 1995 and 1999 to 87% of persons between 2000 and 2004 (Figure 5). Sonoma County has not had a case lost to follow up since 1996.

Figure 5 - Proportion of Cases by Outcome, Sonoma County, 1995-2004*

1995-1999 (N=84)



2000-2004 (N=66)**



*2 MDR cases (1 each in 2002 and 2003) were excluded from these figures.

**10 persons currently in treatment as of 3/3/2004.

Source: State of California, Department of Health Services, TB Control Branch

REFERENCES

1. CDC. Reported Tuberculosis in the United States, 2003. Atlanta, GA: U.S. Department of Health and Human Services, CDC, September 2004.
2. California Department of Health Services. *Report on Tuberculosis in California, 2003*. January 2005.
3. All Sonoma County Tuberculosis data was provided by the State of California, Department of Health Services, Tuberculosis Control Branch.
4. All population data for the years 2000-2004 taken from: State of California, Department of Finance, *Race/Ethnic Population with Age and Sex Detail, 2000–2050*. Sacramento, CA, May 2004.
5. All population data for the years 1993-1999 taken from: State of California, Department of Finance, *Race/Ethnic Population with Age and Sex Detail, 1993-1999*. Sacramento, CA, May 2004.
6. Centers for Disease Control and Prevention. A strategic plan for the elimination of tuberculosis in the United States. MMWR 1989;38(No. S-3).
7. U.S. Department of Health and Human Services. Healthy People 2010. 2nd ed. With Understanding and Improving Health and Objectives for Improving Health. 2 vols. Washington, DC: U.S. Government Printing Office, November 2000.
8. California Department of Health Services. *Report on Tuberculosis in California, 2003*. January 2005.
9. CDC. Reported Tuberculosis in the United States, 2003. Atlanta, GA: U.S. Department of Health and Human Services, CDC, September 2004.