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Executive Summary

This report summarizes data for tuberculosis (TB) cases reported in San Diego County. The data are based on the national case report (Report of a Verified Case of Tuberculosis [RVCT]), a standardized form used throughout the U.S., to collect data for the national TB surveillance system. For the purposes of public health surveillance, a case of TB is defined on the basis of laboratory and/or clinical evidence of active disease due to *M. tuberculosis* complex. Important trends in TB epidemiology in the County are highlighted.

- The annual number of TB cases and TB case rate decreased during 1993-1999. Since 2000, these incidence measures remained fairly level. In 2006, there were 315 cases, representing 10.3 cases per 100,000 population.
- Hispanics accounted for more than 50% of cases.
- In 2006, 74% of all San Diego cases occurred in persons born outside the U.S. Nearly a third of all cases were born in Mexico and 20% were from the Philippines.
- During 2002-2006, among persons with no history of prior TB, resistance to isoniazid (INH) was 9.8% and there were 14 multidrug-resistant (MDR) TB cases, representing 1.1% of culture-positive cases. There were no extensively drug-resistant (XDR) TB cases.
- During 2002-2006, a total of 158 (10%) of 1,582 TB cases were coinfecting with HIV.
- Overall during 2001-2005, at least 95% of patients completed therapy. Among those eligible for the evaluation of timely completion, at least 80% completed therapy in ≤ 1 year.
- During 2002-2006, a total of 149 (11%) of 1,322 culture-positive TB cases had disease caused by *M. bovis*, most commonly attributed to consumption of unpasteurized dairy products in comparison to person-to-person spread through inhalation of aerosolized organisms for *M. tuberculosis*.

Technical Notes

Population data were obtained from the following sources:

- For 1985-1989, California Department of Finance County-level estimates, available at: <http://www.dof.ca.gov/HTML/DEMOGRAP/Data/DRUdatafiles.asp> (accessed July 2007).
- For 1990-1999, San Diego Association of Governments (SANDAG) Revised 1990s Demographic Estimates, issued July 2003.
- For 2000-2006, SANDAG Demographic Estimates, Received by the County Health and Human Services Agency, Public Health Services, Community Epidemiology, September 2006.

Drug resistance:

- Resistance to isoniazid (INH) was defined as resistance to at least INH, but isolate may be resistant to other antituberculous drugs.
- Multidrug-resistant TB was defined as resistance to at least INH and rifampin but isolate may be resistant to other antituberculous drugs.

Completion of therapy (Table 8):

- The cohort was defined as cases in persons alive at diagnosis who started treatment. Persons who moved or died during treatment were excluded from the analysis.
- Cases without known initial rifampin resistance comprised the group of “Therapy ≤ 1 Year Indicated.” For the calculation of completion of therapy in ≤ 1 year, cases with meningeal TB and children with miliary disease were excluded from the calculation.

Table 1 – Tuberculosis Cases, Case Rates per 100,000, and Percent Change: San Diego County, 1985-2006

Year	Cases	Rate	Percent Change	
			Cases	Rate
1985	150	7.2	N/A	N/A
1986	148	6.9	-1.3	-4.5
1987	248	11.2	67.6	61.9
1988	195	8.5	-21.4	-24.0
1989	264	11.1	35.4	30.4
1990	329	13.2	24.6	19.2
1991	366	14.5	11.2	9.8
1992	433	16.8	18.3	16.3
1993	469	18.1	8.3	7.4
1994	420	16.1	-10.4	-10.8
1995	438	16.8	4.3	3.9
1996	384	14.7	-12.3	-12.6
1997	332	12.5	-13.5	-14.6
1998	342	12.2	3.0	-2.5
1999	299	10.4	-12.6	-14.8
2000	295	10.5	-1.3	1.0
2001	331	11.6	12.2	10.5
2002	326	11.2	-1.5	-3.4
2003	316	10.6	-3.1	-5.4
2004	320	10.6	1.3	0.0
2005	305	10.0	-4.7	-5.7
2006	315	10.3	3.3	3.0

During 1985-1992, the United States experienced a resurgence in tuberculosis (TB) reflected by increasing annual TB case totals and case rates (1). This resurgence was attributed to multiple factors including decreased funding and weakened public health infrastructure, the HIV/AIDS epidemic, increasing immigration from higher prevalence countries, and transmission in congregate settings such as hospitals, homeless shelters, and correctional facilities. San Diego County also experienced an increase during this time period, although the increase may have been due in part to underreporting of TB to the health department prior to 1989.

Increased active surveillance activities with community providers were initiated by the health department's TB Control Program in the early 1990s. The County annual case total and case rate peaked in 1993 at 469 cases (18.1 cases per 100,000). During 1993-1999, the case count decreased by 36% (from 469 to 299 cases) and the case rate, by 43% (from 18.1 to 10.4 per 100,000), reflecting strengthened TB control strategies. Since 2000, the County case rate has been fairly level between 10 and 11 cases per 100,000 population.

Table 2 – Tuberculosis Cases, Percentages, and Case Rates per 100,000 Population by Age Group, San Diego County, 1996-2006

Year	Total Cases	0 - 4		5 - 14		15 - 24		25 - 44		45 - 64		65+							
		No.	(%)	Rate	No.	(%)	Rate	No.	(%)	Rate	No.	(%)	Rate						
1996	384	19	(5)	9.9	16	(4)	4.4	49	(13)	11.6	132	(34)	15.1	93	(24)	19.5	75	(20)	26.0
1997	332	13	(4)	6.7	23	(7)	6.2	41	(12)	9.6	95	(29)	10.8	81	(24)	16.6	79	(24)	27.0
1998	342	21	(6)	10.7	21	(6)	5.5	35	(10)	8.1	116	(34)	13.0	81	(24)	16.1	68	(20)	22.7
1999	299	18	(6)	9.1	23	(8)	5.9	24	(8)	5.5	99	(33)	11.0	67	(22)	12.8	68	(23)	22.3
2000	295	13	(4)	6.5	14	(5)	3.4	36	(12)	8.4	107	(36)	11.9	69	(23)	12.4	56	(19)	17.8
2001	331	18	(5)	9.0	16	(5)	3.8	45	(14)	10.2	102	(31)	11.2	89	(27)	15.4	61	(18)	19.2
2002	326	10	(3)	4.9	4	(1)	0.9	39	(12)	8.7	130	(40)	14.1	81	(25)	13.5	62	(19)	19.3
2003	316	15	(5)	7.2	11	(3)	2.6	45	(14)	9.8	105	(33)	11.3	97	(31)	15.4	43	(14)	13.2
2004	320	15	(5)	6.9	21	(7)	5.0	44	(14)	9.5	109	(34)	11.7	81	(25)	12.4	50	(16)	15.2
2005	305	14	(5)	6.2	15	(5)	3.6	43	(14)	9.2	89	(29)	9.6	80	(26)	11.8	64	(21)	19.1
2006	315	19	(6)	8.3	13	(4)	3.2	43	(14)	9.1	90	(29)	9.8	82	(26)	11.7	68	(22)	20.0

Children aged 0 to 4 accounted for 6% of cases in 2006. Although TB disease in young children reflects recent infection, a high proportion of pediatric TB in San Diego County is attributed to *Mycobacterium bovis* (Table 10). The disproportionate burden of TB due to *M. bovis* among children in the County suggests that consumption of unpasteurized dairy products is an important mode of transmission rather than person-to-person transmission via inhalation of aerosolized organisms (the method through which *M. tuberculosis* is spread).

The age groups including 25 to 64 year olds accounted for the majority of cases (55% in 2006). However, persons 65 years and older represented the age group with the highest risk, with a case rate of 20 per 100,000, nearly twice that of the other adults.

Table 3 – Tuberculosis Cases, Percentages, and Case Rates per 100,000 Population by Race/Ethnicity, San Diego County, 1996-2006

Year	Total Cases	American Indian			Asian/Pacific Islander			Black			Hispanic			White		
		No.	(%)	Rate	No.	(%)	Rate	No.	(%)	Rate	No.	(%)	Rate	No.	(%)	Rate
1996	384	0	(0)	N/A	129	(34)	52.2	30	(8)	20.0	161	(42)	25.5	64	(17)	4.1
1997	332	0	(0)	N/A	128	(39)	49.3	29	(9)	19.2	127	(38)	19.5	48	(14)	3.1
1998	342	2	(1)	N/A	108	(32)	39.7	16	(5)	10.5	173	(51)	25.8	43	(13)	2.7
1999	299	3	(1)	N/A	102	(34)	35.9	22	(7)	14.2	138	(46)	19.9	34	(11)	2.2
2000	295	0	(0)	N/A	102	(35)	39.6	23	(8)	14.9	142	(48)	18.9	28	(9)	1.8
2001	331	1	(0)	N/A	97	(29)	35.4	20	(6)	13.0	164	(50)	21.1	49	(15)	3.2
2002	326	0	(0)	N/A	105	(32)	36.8	27	(8)	17.1	156	(48)	19.4	38	(12)	2.4
2003	316	0	(0)	N/A	92	(29)	31.1	24	(8)	15.0	159	(50)	19.1	41	(13)	2.6
2004	320	1	(0)	N/A	100	(31)	32.5	17	(5)	10.6	177	(55)	20.7	25	(8)	1.6
2005	305	0	(0)	N/A	95	(31)	30.7	19	(6)	11.7	160	(52)	18.3	31	(10)	2.0
2006	315	2	(1)	N/A	98	(31)	31.4	21	(7)	12.8	168	(53)	18.8	26	(8)	1.6

More than 50% of San Diego County TB cases occur in Hispanics. Asians and Pacific Islanders account for nearly one-third of cases but have the highest risk, with a case rate of more than 30 per 100,000. In 2006, blacks accounted for 7% of cases, but the case rate among blacks (12.8 per 100,000) was eight times that in whites (1.6 per 100,000). During 2004-2006, more than 50% of cases among blacks were born outside the U.S., primarily in Africa. Case rates among Hispanics in San Diego County are substantially higher than national and California statewide rates (1,2), likely reflecting the effect of San Diego's location along the U.S.-Mexico border.

Table 4 – Tuberculosis Cases and Percentages by Top 16 Birth Countries, San Diego County, 2002-2006

Country of Origin	2006		2005		2004		2003		2002	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Total Cases	315	(100)	305	(100)	320	(100)	316	(100)	326	(100)
Mexico	108	(34)	106	(35)	114	(36)	104	(33)	98	(30)
Philippines	65	(21)	55	(18)	59	(18)	46	(15)	62	(19)
Viet Nam	14	(4)	18	(6)	15	(5)	16	(5)	16	(5)
India	4	(1)	6	(2)	5	(2)	5	(2)	6	(2)
Somalia	7	(2)	2	(1)	1	(0)	6	(2)	10	(3)
Korea, Rep.	1	(0)	0	(0)	4	(1)	6	(2)	5	(2)
China	2	(1)	5	(2)	4	(1)	3	(1)	1	(0)
Laos	3	(1)	2	(1)	2	(1)	4	(1)	3	(1)
Cambodia	5	(2)	0	(0)	2	(1)	2	(1)	4	(1)
Ethiopia	3	(1)	0	(0)	6	(2)	0	(0)	3	(1)
Guatemala	5	(2)	2	(1)	0	(0)	2	(1)	1	(0)
Peru	0	(0)	2	(1)	1	(0)	2	(1)	2	(1)
Honduras	0	(0)	2	(1)	1	(0)	1	(0)	2	(1)
Japan	0	(0)	1	(0)	2	(1)	1	(0)	1	(0)
Thailand	0	(0)	3	(1)	0	(0)	0	(0)	2	(1)
United States	81	(26)	87	(29)	89	(28)	104	(33)	101	(31)

A notable trend in the epidemiology of TB in the U.S. has been the increase in the proportion of cases occurring in persons born outside of the U.S. Between 1993 and 2005, the percentage of TB cases in the foreign born increased from 29% to 55% (1). However, in San Diego County, the percentage was consistently at least 65% during this period. Table 4 displays the top 16 countries of birth during 2002-2006. In 2006, 74% of all San Diego cases occurred in persons born outside the U.S. More than one-third of cases were born in Mexico and 21% were from the Philippines.

Table 5 – Tuberculosis Cases and Percentages by Case Verification Criterion by Site of Disease, San Diego County, 1996-2006

Year	Total Cases	Pulmonary				Extrapulmonary			
		Positive Culture No. (%)	Positive Smear No. (%)	Clinical Case No. (%)	Provider Diagnosis No. (%)	Positive Culture No. (%)	Positive Smear No. (%)	Clinical Case No. (%)	Provider Diagnosis No. (%)
1996	384	245 (82)	2 (1)	37 (12)	14 (5)	57 (66)	2 (2)	22 (26)	5 (6)
1997	332	216 (85)	1 (0)	34 (13)	2 (1)	50 (63)	2 (3)	26 (33)	1 (1)
1998	342	229 (84)	0 (0)	38 (14)	7 (3)	41 (60)	1 (1)	24 (35)	2 (3)
1999	299	183 (82)	0 (0)	31 (14)	10 (4)	42 (56)	2 (3)	26 (35)	5 (7)
2000	295	221 (93)	0 (0)	11 (5)	6 (3)	41 (72)	0 (0)	16 (28)	0 (0)
2001	331	232 (86)	0 (0)	26 (10)	11 (4)	43 (69)	0 (0)	15 (24)	4 (6)
2002	326	230 (91)	0 (0)	6 (2)	16 (6)	51 (69)	0 (0)	15 (20)	8 (11)
2003	316	213 (88)	1 (0)	9 (4)	18 (7)	46 (61)	1 (1)	20 (27)	8 (11)
2004	320	235 (90)	0 (0)	17 (6)	10 (4)	36 (62)	0 (0)	13 (22)	9 (16)
2005	305	204 (85)	0 (0)	17 (7)	18 (8)	45 (68)	0 (0)	16 (24)	5 (8)
2006	315	219 (88)	0 (0)	12 (5)	18 (7)	43 (65)	0 (0)	18 (27)	5 (8)

TB cases are confirmed according the public health surveillance case definition (1) or determination of the TB Control Officer based on review of the patient’s clinical and epidemiologic data. The majority of TB cases are confirmed via culture. In 2006, 88% of pulmonary cases were confirmed via culture compared with 65% of cases with only extrapulmonary disease. Since culture is the standard for diagnosis, few cases are confirmed by the identification of acid fast bacilli on sputum or other body fluid or tissue smear, in the absence of culture being performed (i.e., Verification by Positive Smear). In 2006, 27% of extrapulmonary cases were confirmed using the clinical case definition and 8% were categorized as Provider Diagnosis. This last category is comprised of clinical cases who have negative tuberculin skin tests, due to extensive TB disease or immune system compromise, but had a characteristic clinical course.

Table 6A – Tuberculosis Cases and Percentages by Resistance to Isoniazid or Multidrug Resistance in Persons with No Previous History of TB, by Birth Country, San Diego County, 2002-2006

Year	Resistance to Isoniazid			Resistance to Isoniazid and Rifampin		
	Total Cases No. (%)	U.S.-born No. (%)	Foreign-born No. (%)	Total Cases No. (%)	U.S.-born No. (%)	Foreign-born No. (%)
2002	29 10.7	6 7.8	23 11.9	5 1.9	2 2.6	3 1.6
2003	18 7.6	4 6.1	14 8.2	3 1.3	0 0.0	3 1.8
2004	24 9.5	5 8.5	19 9.9	1 0.4	0 0.0	1 0.5
2005	19 11.0	3 4.7	22 9.3	2 1.2	0 0.0	2 0.8
2006	28 11.6	1 1.8	27 14.5	3 1.2	0 0.0	3 1.6
2002-2006	121 9.8	19 5.9	102 11.1	14 1.1	2 0.6	12 1.3

Table 6B – Tuberculosis Cases and Percentages by Resistance to Isoniazid or Multidrug Resistance in Persons with a Previous History of TB, San Diego County, 2002-2006

Year	Resistance to Isoniazid			Resistance to Isoniazid and Rifampin		
	Total Cases No. (%)	U.S.-born No. (%)	Foreign-born No. (%)	Total Cases No. (%)	U.S.-born No. (%)	Foreign-born No. (%)
2002	3 27.3	0 0.0	3 42.9	1 9.1	0 0.0	1 14.3
2003	3 16.7	2 28.9	1 9.1	2 11.1	1 14.3	1 9.1
2004	2 11.1	1 25.0	1 7.1	1 5.6	0 0.0	1 7.1
2005	3 25.0	0 0.0	3 27.3	1 8.3	0 0.0	1 9.1
2006	5 23.8	0 0.0	5 26.3	2 9.5	0 0.0	2 10.5
2002-2006	16 20.0	3 16.7	13 21.0	7 8.8	1 5.6	6 9.7

TB may become resistant to medications if treatment is inadequate because of patient nonadherence or medical provider error. Resistant TB is more difficult to treat successfully, especially multidrug-resistant (MDR) TB, defined as resistance to both isoniazid (INH) and rifampin, the two most effective first-line drugs. MDR TB has a lower cure rate and a higher mortality rate. Extensively drug-resistant TB (XDR TB) is a relatively rare type of MDR TB also resistant to two classes of second-line medications: fluoroquinolones and at least one of the three injectable drugs (i.e., amikacin, kanamycin, or capreomycin).

Table 6A shows drug resistance for initial TB isolates among persons with no prior history of TB. These persons were presumably infected with the drug-resistant organism. During 2002-2006, overall resistance to INH was 9.8% and there were 14 MDR TB cases, representing 1.1% of culture-positive cases. Persons born outside the U.S. had higher rates of drug-resistant TB. Table 6B shows drug resistance among persons with a prior history of TB, and their drug resistant TB often reflects resistance acquired during treatment of their prior TB episode. During 2002-2006, resistance to INH among persons with prior TB was twice that among persons with no prior TB episode. MDR TB rates were eight times higher among persons with prior TB compared with those with no prior episode. During this period, there were no XDR TB cases, among either persons with or without a prior TB episode.

Table 7 – Demographic and Clinical Characteristics of TB Cases with HIV Coinfection, San Diego County, 2002-2006

	No.	(%)
Agegroup		
<15	2	(1)
15-24	9	(6)
25-44	86	(54)
45-64	55	(35)
65+	6	(4)
Race/ethnicity		
Black	16	(10)
Hispanic	119	(75)
White	19	(12)
Birth Country		
Mexico	102	(65)
United States	45	(28)
Other	11	(7)
TB Risk Factors		
Injecting Drug Use*	15	(10)
Correctional Inmate**	8	(5)
Homeless*	20	(13)
At least one risk factor	32	(20)
Clinical Presentation		
Pulmonary TB	142	(90)
Sputum-smear positive	71	(51)
Extrapulmonary TB (only)	16	(10)
Culture-positive	138	(87)
<i>M. bovis</i>	35	(25)
Isoniazid Resistance	10	(7)
Multidrug-resistance	3	(2)

*in year prior to TB diagnosis

**at TB diagnosis

During 2002-2006, a total of 158 (10%) of 1,582 TB patients in San Diego were also coinfecting with HIV. Nearly 90% of cases occurred in persons aged 25-64 years old, 75% were Hispanic, and 65% were born in Mexico. Most (90%) were diagnosed with pulmonary TB, with or without extrapulmonary involvement, and more than 50% of these patients had an elevated infectious potential based on a positive sputum smear for acid fast bacilli. Drug resistance was not notably higher than among all TB patients; however, 25% of culture-positive patients had TB due to *M. bovis*. Disease due to *M. bovis* is most commonly attributed to consumption of unpasteurized dairy products (see [Table 2](#) and [Table 10](#)). although may occur by person-to-person transmission via inhalation of aerosolized organisms.

Table 8 – Tuberculosis Cases and Percentages by Completion of Tuberculosis Therapy (COT), San Diego County, 2002-2006

Year	Therapy \leq 1 Year Indicated			Therapy $>$ 1 Year Indicated		All Drug Therapy	
	No.	COT \leq 1 year(%)	COT(%)	No.	COT (%)	No.	COT(%)
2001	283	(82)	(93)	2	(100)	285	(93)
2002	272	(83)	(95)	8	(88)	280	(95)
2003	270	(84)	(95)	6	(83)	276	(95)
2004	274	(82)	(95)	3	(67)	277	(95)
2005	266	(80)	(97)	2	(100)	268	(97)

A key objective of TB control programs is to ensure that patients complete appropriate therapy. This strategy assists in interrupting transmission and reducing risk for the development of drug resistance. The Centers for Disease Control and Prevention developed a program performance measure of timely completion of therapy to monitor progress toward this objective. The measure is defined for persons whose initial TB presentation indicated \leq 1 year of TB treatment (1). The usual TB treatment duration is 6 months for drug-susceptible TB, but may be longer in the setting of extensive disease, poor clinical response, or development of drug side effects (3).

Table 8 shows data for the performance measure of timely completion of therapy (COT) [Therapy \leq 1 Year Indicated], completion for cases with known initial rifampin resistance which extends treatment duration beyond 12-18 months [Therapy $>$ 1 Year Indicated], and completion for all cases combined (All Drug Therapy). Overall during 2001-2005, at least 95% of patients completed therapy. Among those eligible for the evaluation of timely completion, at least 80% completed therapy in \leq 1 year. Annual reviews have consistently confirmed that the majority of patients with delayed completion had clinically indicated reasons for extension of treatment, primarily medication intolerance or extensive disease/delayed treatment response.

Table 9 – Tuberculosis Cases and Percentages by TB Risk Factor, San Diego County, 2002-2006

TB Risk Factor	Year						
	2002-2006		2002	2003	2004	2005	2006
	No.	(%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Long-term Care Resident at Diagnosis	15	(1)	3 (1)	2 (1)	3 (1)	4 (1)	3 (1)
Correctional Inmate at Diagnosis	118	(7)	16 (5)	30 (9)	34 (11)	23 (8)	15 (5)
Homeless*	101	(6)	19 (6)	23 (7)	15 (5)	23 (8)	21 (7)
Health Care Worker**	32	(2)	4 (1)	5 (2)	9 (3)	5 (2)	9 (3)
Migrant Worker**	9	(1)	0 (0)	1 (0)	3 (1)	2 (1)	3 (1)
Injecting Drug Use*	41	(3)	8 (3)	9 (3)	9 (3)	8 (3)	7 (2)
Non-injecting Drug*	114	(7)	15 (5)	31 (10)	20 (6)	26 (9)	22 (7)
Excess Alcohol Use*	170	(11)	27 (9)	46 (15)	31 (10)	36 (12)	30 (10)
At Least One Risk Factor	374	(24)	64 (20)	88 (28)	76 (24)	76 (25)	70 (22)

*in year prior to TB diagnosis

**occupation within 2 years prior to TB diagnosis

The national TB case report collects information about risk factors for TB infection and disease. Among persons reported with TB during 2002-2006, the most commonly identified risks included diagnosis of TB as a correctional inmate (7%), and homelessness (6%), non-injecting drug use (7%), and excessive alcohol use (11%) in the year prior to TB diagnosis. Nearly one-quarter of patients had at least one risk factor.

Table 10 – Demographic and Clinical Characteristics of TB Cases due to *Mycobacterium bovis*, San Diego County, 2002-2006

	No.	(%)
Agegroup		
0-14	31	(21)
15-24	23	(15)
25-44	51	(34)
45-64	27	(18)
65+	17	(11)
Race/ethnicity		
Asian/Pacific Islander	1	(1)
Black	0	(0)
Hispanic	144	(97)
White	4	(3)
Birth Country		
US	62	(42)
Mexico	86	(58)
Clinical Presentation		
Pulmonary TB	80	(54)
Extrapulmonary TB (only)	69	(46)
Cervical Lymphadenopathy	36	(52)
Peritoneal	11	(16)
HIV coinfection	35	(23)
Isoniazid Resistance	8	(5)

Disease due to *Mycobacterium bovis* is usually contracted through the consumption of unpasteurized dairy products. Person-to-person transmission via inhalation of aerosolized organisms (the method through which *M. tuberculosis* is spread) is also believed to occur. TB due to *M. bovis* is more frequently identified among County TB cases, using biochemical techniques, compared with the national average of approximately 1%, estimated using genotyping techniques (4). During 2002-2006 in San Diego County, a total of 149 (11%) of 1,322 culture-positive TB cases had disease caused by *M. bovis*. Thirty-four percent occurred among the 25 to 44 year old age group; however, 21% occurred among children less than 15 years old. Among persons with culture-proven TB, 9% of adults and 58% of children less than 15 years old had TB due to *M. bovis*. Nearly all were Hispanic and 58% were born in Mexico. The only other birth country was the U.S.

Pulmonary TB was a less frequent presentation (54%) than among all culture-confirmed cases (83%) [Table 5]. The most common extrapulmonary presentation was cervical lymphadenopathy and accounted for 65% of TB due to *M. bovis* among children. Resistance to isoniazid was lower than among all TB cases, and no multidrug-resistant (MDR) TB cases occurred. All cases had isolates resistant to pyrazinamide, the resistance pattern associated with *M. bovis*. Because of pyrazinamide resistance, the standard treatment duration of 6 months for drug-susceptible TB is usually extended to 9 months, since pyrazinamide is a critical first-line drug in the “short course” TB treatment regimen (3).

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