

2008 Annual Tuberculosis Surveillance Report

Virginia Department of Health

Office of Epidemiology

**Division of Disease Prevention
Tuberculosis Control**

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Acknowledgements

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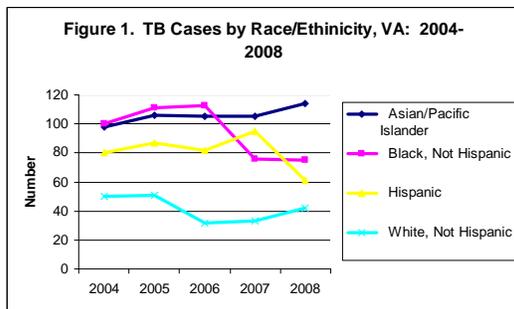
Epidemiology of Tuberculosis: 2008

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In 2008, Virginia reported 292 *Mycobacterium tuberculosis* (TB) cases, a 5.5 decrease from the 309 cases in 2007. In spite of this decline, Virginia ranks 10th in the nation for reported TB cases and with a case rate of 3.8 per hundred thousand, TB remains a problem of public health significance. In this report, data on demographics and selected risk factors are provided at the state and health region level for 2004 to 2008.

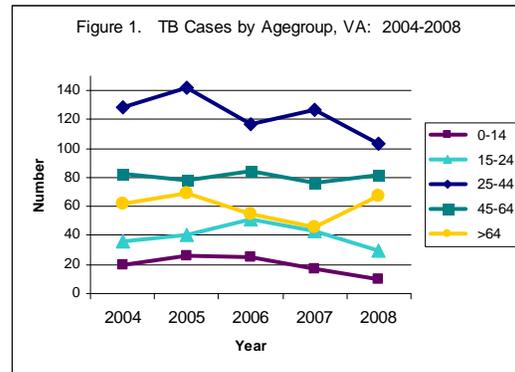
Sex and Race

In 2008, 42.1% of TB cases were female and 57.9% were male. Among racial and ethnic groups, the most substantial decline occurred among Hispanics with a decrease of 35.8% from 2007. Increases occurred among Asians and Whites and cases among Blacks were flat in 2008 (Figure 1).



Age

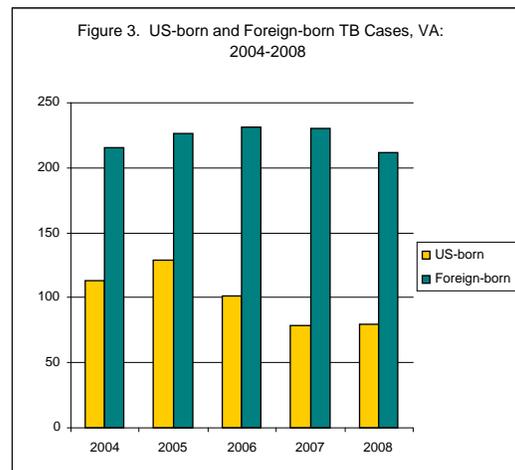
Ten pediatric cases, aged 0 to 14 were reported in 2008 as compared to 17 cases in 2007. Among the 15-24 year old age group, 30 cases were reported for a decrease of 30% from 2007. The 25-44 year old age group experienced a substantial decrease with 103 cases reported compared to 127 in 2007. Increases occurred among those aged 45 and above. In 2008, 82 cases occurred among the 45-64 year old age group compared to 76 cases in 2007. Those aged over 65 reported the largest increase with 67 cases reported compared to 46 cases in 2007 (Figure 2).



Place of Origin

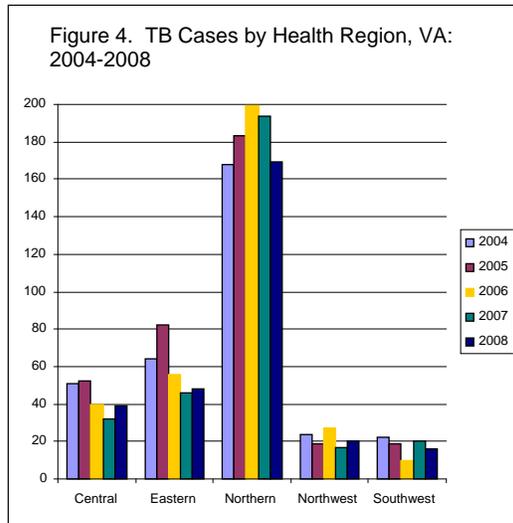
Since 2000, foreign-born cases have surpassed US-born cases. In 2008, 212 or 72.6% of Virginia's TB cases were reported among foreign-born persons (Figure 2). Foreign-born cases declined by 7.8% compared to 2007. The number of cases reported among US-born persons is virtually unchanged from 2007. The slowing of the decline among US-born persons is part of a national trend.

The diversity of cultures and countries of origin among Virginia's TB cases is remarkable. These cases represent 42 countries of origin and speak 19 languages other than English. The top five countries of origin include India, Viet Nam, the Philippines, Ethiopia and Mexico.



Geographic Distribution

The distribution of TB cases in Virginia is quite stable with the majority of cases (57.9%) reported from the Northern Health Region. In 2008, Northern did report a decrease from 2007. This decrease tracks the decline in foreign-born cases. Central, Eastern and Northwest reported small increases over 2007 and Southwest reported a decrease (Figure 4).



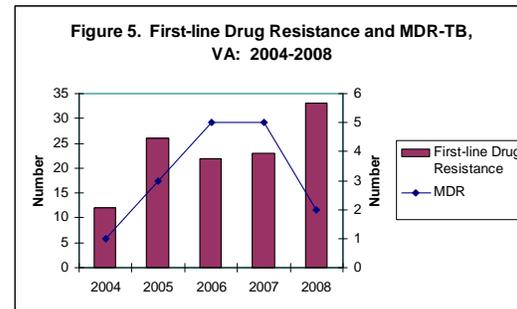
HIV Co-Infection and Selected Risk Factors

Several risk factors are associated with TB including occupational risk, congregate living, co-infection with HIV, homelessness, substance use and diabetes. In 2008, 6 health care workers were reported with TB. TB was reported in 5 residents of long-term care facilities, 5 incarcerated persons and 4 homeless persons. Overall, 9 (3.1%) of Virginia's cases were reported with HIV infection as compared to 10 (3.2%) of cases in 2007. In 2008, 19 cases (6.5%) reported excessive alcohol use and 6 cases (2.1%) reported illicit drug use. Diabetes was the most frequent risk reported with 40 cases (13.7%) reported in 2008.

Drug Resistance

Two hundred nineteen TB cases were culture positive and had drug susceptibility testing performed. Drug resistance was found in 35 cases. Two cases of multidrug

resistant TB (MDR-TB) were reported. (By definition MDR-TB is resistant to both isoniazid and rifampin). Resistance to at least one first-line drug, most frequently isoniazid, was found in 33 cases. No cases meeting the definition of extensively drug-resistant (XDR) TB were reported in 2008 (Figure 5).



Mortality

In 2008, 17 (5.8%) TB cases died during treatment and three (1.0%) cases were diagnosed at the time of death or post-mortem. Of note, nearly a third (7/20) of these deaths occurred among people younger than 65 years old. While several individuals had complicated co-morbidities, no pattern can be discerned in these untimely deaths. They highlight the need for a high index of suspicion for TB even among younger people.

Treatment Outcomes

For 2007, the year with the most complete data available, 90.1 % of the drug-susceptible cases completed therapy within 12 months.

Contact Investigations

In 2006, 1,166 contacts to acid-fast bacilli (AFB) smear positive cases were identified. Of those, 90% were evaluated for infection and disease. Among the 392 people identified with latent TB infection (LTBI), 237 (60%) were started on treatment and 146 (62%) completed treatment for latent TB infection.

Table 1. Number and Rate of Tuberculosis Cases: Virginia and United States, 1999-2008

Year	Virginia		United States	
	No.	Rate	No.	Rate
1999	334	4.8	17,501	6.3
2000	292	4.1	16,309	5.8
2001	306	4.3	15,946	5.6
2002	315	4.3	15,056	5.2
2003	332	4.5	14,840	5.1
2004	329	4.4	14,515	4.9
2005	355	4.7	14,097	4.8
2006	332	4.3	13,767	4.6
2007	309	4.0	13,293	4.4
2008	292	3.8	12,898	4.2

Historical US data from: CDC. Reported Tuberculosis in the United States, 2005. Atlanta, GA: US DHHS, CDC, September 2006.

2008 US data from: Trends in Tuberculosis--United States, MMWR 2009; 57(11): 281.

Table 2. Tuberculosis Cases and Rate per 100,000 by Health Region: Virginia, 2004-2008

Region	2004			2005			2006			2007			2008		
	No.	%	Rate												
Total	329	100	4.4	355	100	4.7	332	100	4.3	309	100	4.0	292	100	3.8
Central	51	15.5	4.1	52	14.6	4.0	40	12.0	3.1	32	10.4	2.4	39	13.4	2.9
Eastern	64	19.5	3.6	82	23.1	4.6	56	16.9	3.1	46	14.9	2.6	48	16.4	2.7
Northern	168	51.1	8.5	183	51.5	9.0	199	59.9	9.7	194	62.8	9.3	169	57.9	8.0
Northwest	24	7.3	2.2	19	5.4	1.6	27	8.1	2.3	17	5.5	1.4	20	6.8	1.7
Southwest	22	6.7	1.7	19	5.4	1.4	10	3.0	0.8	20	6.5	1.5	16	6.8	1.2

Table 3. Tuberculosis Cases by Demographics and Location: Virginia, 2004-2008

Total Cases	2004		2005		2006		2007		2008	
	329		355		332		309		292	
	No	%								
Sex										
Female	162	49.2	173	48.7	142	42.8	129	41.7	123	42.1
Male	167	50.8	182	51.3	190	57.2	180	58.3	169	57.9
Race/Ethnicity										
Asian/Pacific Islander	98	29.8	106	29.9	105	31.6	105	34.0	114	39.0
Black, Not Hispanic	100	30.4	111	31.3	113	34.0	76	24.6	75	25.7
Hispanic	80	24.3	87	24.5	82	24.7	95	30.7	61	20.9
White, Not Hispanic	50	15.2	51	14.4	32	9.6	33	10.7	42	14.4
Other	1	0.30	0	0.0	0	0.0	0	0.0	0	0.0
Age										
0-14	20	6.1	26	7.3	25	7.5	17	5.5	10	3.4
15-24	36	10.9	40	11.3	51	15.4	43	13.9	30	10.3
25-44	128	38.9	142	40.0	117	35.2	127	41.1	103	35.3
45-64	83	25.2	78	22.0	84	25.3	76	24.6	82	28.1
>64	62	18.8	69	19.4	55	16.6	46	14.9	67	22.9
Place of Birth										
Foreign-born	216	65.7	225	63.4	230	69.3	230	74.4	212	72.6
US-born	113	34.3	130	36.6	102	30.7	79	25.6	80	27.4
Health Region										
Central	51	15.5	52	14.6	40	12.0	32	10.4	39	13.4
Eastern	64	19.5	82	23.1	56	16.9	46	14.9	48	16.4
Northern	168	51.1	183	51.5	199	59.9	194	62.8	169	57.9
Northwest	24	7.3	19	5.4	27	8.1	17	5.5	20	6.8
Southwest	22	6.7	19	5.4	10	3.0	20	6.5	16	5.5

Table 4. Tuberculosis Cases by Demographics and Region: Central, 2004-2008

	2004		2005		2006		2007		2008	
	51		52		40		32		39	
Total Cases	No.	%								
Sex										
Female	19	37.3	24	46.2	12	30.0	12	37.5	13	33.3
Male	32	62.7	28	53.8	28	70.0	20	62.5	26	66.7
Race/Ethnicity										
Asian/Pacific Islander	6	11.8	11	21.2	6	15.0	1	3.1	10	25.6
Black, Not Hispanic	28	54.9	27	51.9	24	60.0	19	59.4	17	43.6
Hispanic	10	19.6	5	9.6	3	7.5	8	25.0	7	17.9
White, Not Hispanic	7	13.7	9	17.3	7	17.5	4	12.5	5	12.8
Age										
0-14	2	3.9	4	7.7	2	5.0	2	6.3	2	5.1
15-24	6	11.8	6	11.5	3	7.5	8	25.0	8	20.5
25-44	18	35.3	18	34.6	12	30.0	8	25.0	14	35.9
45-64	19	37.3	16	30.8	14	35.0	9	28.1	7	17.9
>64	6	11.8	8	15.4	9	22.5	5	15.6	8	20.5
Place of Birth										
Foreign-born	21	41.2	18	34.6	11	27.5	13	40.6	16	41.0
US Born	30	58.8	34	65.4	29	72.5	19	59.4	23	59.0

Table 5. Tuberculosis Cases by Demographics and Region: Eastern, 2004-2008

	2004		2005		2006		2007		2008	
	64		82		56		46		48	
Total Cases	No.	%								
Sex										
Female	30	46.9	32	39.0	30	53.6	19	41.3	28	58.3
Male	34	53.1	50	61.0	26	46.4	27	58.7	20	41.7
Race/Ethnicity										
Asian/Pacific Islander	14	21.9	14	17.1	12	21.4	17	37.0	16	33.3
Black, Not Hispanic	29	45.3	45	54.9	33	58.9	19	41.3	16	33.3
Hispanic	5	7.8	9	11.0	9	16.1	4	8.7	5	10.4
White, Not Hispanic	16	25.0	14	17.1	2	3.6	6	13.0	11	22.9
Age										
0-14	2	3.1	7	8.5	5	8.9	1	2.2	2	4.2
15-24	2	3.1	6	7.3	9	16.1	1	2.2	4	8.3
25-44	21	32.8	30	36.6	12	21.4	13	28.3	11	22.9
45-64	22	34.4	16	19.5	13	23.2	21	45.7	13	27.1
>64	17	26.6	23	28.0	17	30.4	10	21.7	18	37.5
Place of Birth										
Foreign-born	22	34.4	29	35.4	20	35.7	20	43.5	24	50.0
US-born	42	65.6	53	64.6	36	64.3	26	56.5	24	50.0

Table 6. Tuberculosis Cases by Demographics and Region: Northern, 2004-2008

	2004		2005		2006		2007		2008	
	168		183		199		194		169	
Total Cases	No.	%								
Sex										
Female	91	54.2	104	56.8	90	45.2	85	43.8	74	43.8
Male	77	45.8	79	43.2	109	54.8	109	56.2	95	56.2
Race/Ethnicity										
Asian/Pacific Islander	73	43.5	78	42.6	85	42.7	81	41.8	79	46.7
Black, Not Hispanic	34	20.2	26	14.2	48	24.1	29	14.9	35	20.7
Hispanic	52	31.0	66	36.1	54	27.1	77	39.7	40	23.7
White, Not Hispanic	9	5.4	13	7.1	12	6.0	7	3.6	15	8.9
Age										
0-14	10	6.0	13	7.1	14	7.0	12	6.2	4	2.4
15-24	24	14.3	22	12.0	34	17.1	30	15.5	15	8.9
25-44	76	45.2	87	47.5	81	40.7	94	48.5	65	38.5
45-64	31	18.5	33	18.0	48	24.1	38	19.6	51	30.2
>64	27	16.1	28	15.3	22	11.1	20	10.3	34	20.1
Place of Birth										
Foreign-born	154	91.7	163	89.1	179	89.9	179	92.3	153	90.5
US-born	14	8.3	20	10.9	20	10.1	15	7.7	16	9.5

Table 7. Tuberculosis Cases by Demographics and Region: Northwest, 2004-2008

	2003		2004		2005		2006		2008	
	29		24		19		27		20	
Total Cases	No.	%								
Sex										
Female	9	31.0	12	50.0	9	47.4	9	33.3	5	25.0
Male	20	69.0	12	50.0	10	52.6	18	66.7	15	75.0
Race/Ethnicity										
Asian/Pacific Islander	3	10.3	4	17.4	1	5.3	2	7.4	5	25.0
Black, Not Hispanic	3	10.3	3	13.0	8	42.1	7	25.9	4	20.0
Hispanic	14	48.3	11	47.8	5	26.3	15	55.6	7	35.0
White, Not Hispanic	9	31.0	5	21.7	5	26.3	3	11.1	4	20.0
Other	na	na	1	4.2	0	0.0	0	0.0	0	0.0
Age										
0-14	3	10.3	4	16.7	1	5.3	3	11.1	2	10.0
15-24	8	27.6	4	16.7	5	26.3	4	14.8	3	15.0
25-44	6	20.7	8	33.3	3	15.8	10	37.0	7	35.0
45-64	7	24.1	7	29.2	8	42.1	6	22.2	7	35.0
>64	5	17.2	1	4.2	2	10.5	4	14.8	1	5.0
Place of Birth										
Foreign-born	18	62.1	15	62.5	9	47.4	20	74.1	12	60.0
US-born	11	37.9	9	37.5	10	52.6	7	25.9	8	40.0

Table 8. Tuberculosis Cases by Demographics and Region: Southwest, 2004-2008

	2004		2005		2006		2007		2008	
	22		19		10		20		16	
Total Cases	No.	%	No.	%	No.	%	No.	%	No.	%
Sex										
Female	10	45.5	4	21.1	1	10.0	5	25.0	3	18.8
Male	12	54.5	15	78.9	9	90.0	15	75.0	13	81.3
Race/Ethnicity										
Asian/Pacific Islander	1	4.5	2	10.5	0	0.0	2	10.0	4	25.0
Black, Not Hispanic	6	27.3	4	21.1	1	10.0	6	30.0	3	18.8
Hispanic	2	9.1	2	10.5	1	10.0	2	10.0	2	12.5
White, Not Hispanic	13	59.1	11	57.9	8	80.0	10	50.0	7	43.8
Age										
0-14	2	9.1	1	5.3	1	10.0	2	10.0	0	0.0
15-24	0	0.0	1	5.3	1	10.0	4	20.0	0	0.0
25-44	5	22.7	4	21.1	2	20.0	3	15.0	7	43.8
45-64	4	18.2	5	26.3	3	30.0	3	15.0	3	18.8
>64	11	50.0	8	42.1	3	30.0	8	40.0	6	37.5
Place of Birth										
Foreign-born	4	18.2	6	31.6	0	0.0	8	40.0	7	43.8
US-born	18	81.8	13	68.4	10	100.0	12	60.0	9	56.3

Table 9. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Virginia, 2004-2008

Race/Ethnicity	2004		2005		2006		2007		2008	
	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born
Total	113	216	129	226	101	231	79	230	80	212
Asian/Pacific Islander	3	95	5	101	5	100	3	102	3	111
Black, Not Hispanic	64	36	76	36	62	51	45	31	37	38
Hispanic	6	74	8	79	8	74	5	90	3	58
White, Not Hispanic	40	10	40	10	26	6	26	7	37	5
Other	0	1	0	0	0	0	0	0	0	0

Table 10. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Central Region, 2004-2008

Race/Ethnicity	2004		2005		2006		2007		2008	
	US-born	Foreign-born								
Total	30	21	34	18	29	11	19	13	23	16
Asian/Pacific Islander	0	6	2	9	0	6	0	1	1	9
Black, Not Hispanic	24	4	24	3	21	3	14	5	17	0
Hispanic	0	10	0	5	1	2	1	7	0	7
White, Not Hispanic	6	1	8	1	7	0	4	0	5	0

Table 11. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Eastern Region, 2004-2008

Race/Ethnicity	2004		2005		2006		2007		2008	
	US-born	Foreign-born								
Total	42	22	53	29	36	20	26	20	24	24
Asian/Pacific Islander	1	13	1	13	1	11	1	16	0	16
Black, Not Hispanic	27	2	39	6	32	1	19	0	13	3
Hispanic	0	5	0	9	1	8	1	3	1	4
White, Not Hispanic	14	2	13	1	2	0	5	1	10	1

Table 12. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Northern Region, 2004-2008

Race/Ethnicity	2004		2005		2006		2007		2008	
	US-born	Foreign-born								
Total	14	154	20	163	20	179	15	179	16	153
Asian/Pacific Islander	2	71	2	76	4	81	2	79	2	77
Black, Not Hispanic	6	28	3	23	4	44	7	22	2	33
Hispanic	3	49	8	58	4	50	3	74	1	39
White, Not Hispanic	3	6	7	6	8	4	3	4	11	4

Table 13. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Northwest Region, 2004-2008

Race/Ethnicity	2004		2005		2006		2007		2008	
	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born
Total	9	15	10	9	7	20	7	10	8	12
Asian/Pacific Islander	0	4	0	1	0	2	0	4	0	5
Black, Not Hispanic	2	1	5	3	4	3	2	1	3	1
Hispanic	3	8	0	5	1	14	0	4	1	6
White, Not Hispanic	4	1	5	0	2	1	5	1	4	0
Other	0	1	0	0	0	0	0	0	0	0

Table 14. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Southwest Region, 2004-2008

Race/Ethnicity	2004		2005		2006		2007		2008	
	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born
Total	18	4	13	6	10	0	12	8	9	7
Asian/Pacific Islander	0	1	0	2	0	0	0	2	0	4
Black, Not Hispanic	5	1	3	1	1	0	0	3	2	1
Hispanic	0	2	0	2	1	0	3	2	0	2
White, Not Hispanic	13	0	10	1	8	0	9	1	7	0

Table 15. Tuberculosis Cases by Selected Risk Factors: Virginia, 2004-2008

Total Cases	2004		2005		2006		2007		2008	
	329		355		332		309		292	
	No.	%								
Occupation										
Health Care	6	1.8	7	2.0	6	1.8	5	1.6	6	2.1
Migrant	3	0.9	4	1.1	1	0.3	0	0.0	0	0.0
Corrections	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Type of Residence										
Long Term Care	15	4.6	13	3.7	13	3.9	2	0.6	5	1.7
Prison/Jail	7	2.1	8	2.3	4	1.2	6	1.9	5	1.7
Homeless	7	2.1	6	1.7	2	0.6	8	2.6	4	1.4
Co-Morbidity										
HIV	15	4.6	21	5.9	22	6.6	10	3.2	9	3.1
Diabetes	22	6.6	24	8.2	33	9.9	28	9.1	40	13.7
Substance Use										
Alcohol	29	8.8	34	9.6	28	8.4	25	8.1	19	6.5
IDU	3	0.9	2	0.6	6	1.8	5	1.6	0	0.0
Non-IDU	9	2.7	12	3.4	9	2.7	8	2.6	6	2.1

Table 16. Tuberculosis Cases by Selected Risk Factors: Central Region, 2004-2008

Total Cases	2004		2005		2006		2007		2008	
	51		52		40		32		39	
	No.	%	No.	%	No.	%	No.	%	No.	%
Occupation										
Health Care	0	0.0	0	0.0	1	2.5	0	0.0	0	0.0
Migrant	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Corrections	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Type of Residence										
Long Term Care	2	3.9	3	5.8	1	2.5	0	0.0	1	2.6
Prison/Jail	0	0.0	2	3.8	0	0.0	2	6.3	1	2.6
Homeless	1	2.0	1	1.9	2	5.0	1	3.1	0	0.0
Co-Morbidity										
HIV	4	7.8	5	9.6	6	15.0	0	0.0	1	2.6
Diabetes	6	11.8	4	7.7	4	10.0	1	3.1	3	7.7
Substance Use										
Alcohol	7	13.7	7	13.5	8	20.0	4	12.5	3	7.7
IDU	1	2.0	0	0.0	6	15.0	0	0.0	0	0.0
Non-IDU	1	2.0	4	7.7	1	2.5	3	9.4	2	5.1

Table 17. Tuberculosis Cases by Selected Risk Factors: Eastern Region, 2004-2008

Total Cases	2004		2005		2006		2007		2008	
	64		82		56		46		48	
	No.	%	No.	%	No.	%	No.	%	No.	%
Occupation										
Health Care	2	3.1	1	1.2	0	0.0	1	2.2	0	0.0
Migrant	3	4.7	4	4.9	1	1.8	0	0.0	0	0.0
Corrections	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Type of Residence										
Long Term Care	1	1.6	1	1.2	2	3.6	1	2.2	0	0.0
Prison/Jail	1	1.6	2	2.4	0	0.0	0	0.0	1	2.1
Homeless	2	3.1	3	3.7	0	0.0	2	4.3	0	0.0
Co-Morbidity										
HIV	5	7.8	6	7.3	4	7.1	3	6.5	1	2.1
Diabetes	5	7.8	8	9.8	7	12.5	4	8.7	9	18.8
Substance Use										
Alcohol	2	3.1	14	17.1	3	5.4	4	8.7	6	12.5
IDU	0	0.0	1	1.2	0	0.0	0	0.0	0	0.0
Non-IDU	1	1.6	5	6.1	3	5.4	4	8.7	2	4.2

Table 18. Tuberculosis Cases by Selected Risk Factors: Northern Region, 2004-2008

Total Cases	2004		2005		2006		2007		2008	
	168		183		198		194		169	
	No.	%								
Occupation										
Health Care	3	1.8	5	2.7	5	2.5	3	1.5	5	3.0
Migrant	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Corrections	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Type of Residence										
Long Term Care	8	4.8	7	3.8	3	1.5	0	0.0	4	2.4
Prison/Jail	1	0.6	2	1.1	1	0.5	1	0.5	2	1.2
Homeless	4	2.4	1	0.5	0	0.0	5	2.6	3	1.8
Co-Morbidity										
HIV	5	3.0	9	4.9	10	5.1	4	2.1	4	2.4
Diabetes	11	6.5	10	5.5	19	9.6	19	9.8	25	14.8
Substance Use										
Alcohol	7	4.2	5	2.7	5	2.5	8	4.1	7	4.1
IDU	2	1.2	0	0.0	0	0.0	1	0.5	0	0.0
Non-IDU	3	1.8	1	0.5	2	1.0	2	1.0	1	0.6

Table 19. Tuberculosis Cases by Selected Risk Factors: Northwest Region, 2004-2008

Total Cases	2004		2005		2006		2007		2008	
	24		19		28		17		20	
	No.	%	No.	%	No.	%	No.	%	No.	%
Occupation										
Health Care	3	12.5	1	5.3	0	0.0	1	5.9	1	5.0
Migrant	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Corrections	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Type of Residence										
Long Term Care	2	8.3	0	0.0	4	14.3	0	0.0	0	0.0
Prison/Jail	1	4.2	1	5.3	3	10.7	1	5.9	1	5.0
Homeless	0	0.0	1	5.3	0	0.0	0	0.0	0	0.0
Co-Morbidity										
HIV	0	0.0	0	0.0	2	7.1	2	11.8	2	10.0
Diabetes	1	4.2	1	5.3	3	10.7	1	5.9	1	5.0
Substance Use										
Alcohol	7	29.2	1	5.3	7	25.0	3	17.6	2	10.0
IDU	0	0.0	0	0.0	0	0.0	2	0.0	0	0.0
Non-IDU	2	8.3	1	5.3	1	3.6	1	5.9	1	5.0

Table 20. Tuberculosis Cases by Selected Risk Factors: Southwest Region, 2004-2008

Total Cases	2004		2005		2006		2007		2008	
	22		19		10		20		16	
	No.	%								
Occupation										
Health Care	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Migrant	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Corrections	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Type of Residence										
Long Term Care	3	13.6	2	10.5	3	30.0	1	5.0	0	0.0
Prison/Jail	2	9.1	1	5.3	0	0.0	2	10.0	0	0.0
Homeless	0	0.0	0	0.0	0	0.0	0	0.0	1	0.0
Co-Morbidity										
HIV	1	4.5	0	0.0	0	0.0	1	5.0	1	6.3
Diabetes	1	4.5	0	0.0	0	0.0	3	15.0	2	12.5
Substance Use										
Alcohol	6	27.3	6	31.6	4	40.0	5	25.0	1	6.3
IDU	0	0.0	1	5.3	0	0.0	2	11.8	0	0.0
Non-IDU	2	9.1	1	5.3	2	20.0	0	0.0	0	0.0

Table 21. Culture Positive Tuberculosis Cases with Drug Resistance: Virginia, 2004-2008

Initial Susceptibilities	2004*		2005		2006		2007		2008	
	254		260		253		219		219	
	No.	%	No.	%	No.	%	No.	%	No.	%
Total Drug Resistance	13	5.1	29	11.2	27	10.7	28	12.8	35	16.0
Any first line drug	12	4.7	26	10.0	22	8.7	23	10.5	33	15.1
Multidrug**	1	0.4	3	1.2	5	2.0	5	2.3	2	0.9

*Due to changes in definitions, streptomycin is no longer considered a first line drug. The drop in the number of resistance cases is an artifact of the new definition.

**Multidrug resistance or MDR is by definition resistance to isoniazid and rifampin.

Table 22. Tuberculosis Mortality: Virginia, 2004-2008*

Total Cases	2004		2005		2006		2007		2008	
	329		355		332		309		292	
	No.	%								
Total Deaths	26	7.9	31	8.7	27	8.1	11	3.6	20	6.8
Dead at Time Diagnosis	7	2.1	6	1.7	11	3.3	5	1.6	3	1.0
Died During Treatment	19	5.8	25	7.0	16	4.8	6	1.9	17	5.8

Technical Notes

TB disease is a reportable condition as defined in the *Regulations for Disease Reporting and Control*. In addition, TB infection in children under age 4 is also a reportable condition. The Division of Disease Prevention, TB Control conducts surveillance for TB disease in the entire population and for TB infection among children. It collects, analyzes, and disseminates data as an integral part of TB control.

Rates per 100,000

In Table 1 rates for Virginia from 1994 to 1999 were calculated using population estimates provided by the Virginia Employment Commission. In Tables 1 and 2, rates for 2000-2006 were calculated using 2000 Census data released by the United States Bureau of the Census, Population Estimates Program. Annual Estimates of the Population for Counties of Virginia: April 1, 2000 to July 1, 2006 (CO-EST2006-01-51).

Definitions

Pediatric: In this report “pediatric” refers to persons up to and including the age of 14 years old.

Tuberculosis Case Definition¹

Cases confirmed as official morbidity in Virginia and included in this report meet the following case definition:

Clinical description

A chronic bacterial infection caused by *Mycobacterium tuberculosis*, characterized pathologically by the formation of granulomas. The most common site of infection is the lung, but other organs may be involved.

Clinical Case Definition

A case that meets the following criteria:

- A positive tuberculin skin test
- Other signs and symptoms compatible with tuberculosis (e.g., an abnormal, unstable [i.e., worsening or improving] chest radiograph, or clinical evidence of current disease)
- Treatment with two or more antituberculosis medications
- A completed diagnostic evaluation [*to rule out other conditions*]
- [*Virginia also requires documented clinical improvement on treatment*]

Laboratory criteria for diagnosis

- Isolation of *M. tuberculosis* from a clinical specimen* or
- Demonstration of *M. tuberculosis* from a clinical specimen by nucleic acid amplification test**, or
- Demonstration of acid-fast bacilli in a clinical specimen when a culture has not been or cannot be obtained.

¹ CDC. Case Definitions for infectious conditions under public health surveillance. MMWR 1997;46 (No. RR-10):40-41.

Case classification

Confirmed: a case that meets the clinical case definition or is laboratory confirmed.

*Use of rapid identification techniques for *M. tuberculosis* (e.g., DNA probes and mycolic acids high-pressure liquid chromatography performed on a culture from a clinical specimen) are acceptable under this criterion.

**Nucleic acid amplification (NAA) tests must be accompanied by culture for mycobacteria species. However, for surveillance purposes, CDC will accept results obtained from NAA tests approved by the Food and Drug Administration (FDA) and used according to the approved product labeling on the package insert.