

# **2007 Annual Tuberculosis Surveillance Report**

**Virginia Department of Health**

**Office of Epidemiology**

**Division of Disease Prevention  
Tuberculosis Control**

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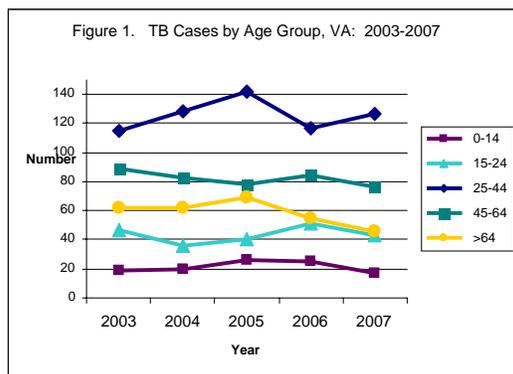
In 2007, Virginia reported 309 *Mycobacterium tuberculosis* (TB) cases, a 6.9% decrease from the 332 cases in 2006. In spite of this decline, Virginia ranks 9<sup>th</sup> in the nation for reported TB cases and with a case rate of 4.0 per hundred thousand, TB remains a problem of public health significance. In this report, data on demographics and selected risk factors are provided at the state and health region level for 2003 to 2007.

### Sex and Race

In 2007, 41.7% of TB cases were female and 58.3% were male. Among racial and ethnic groups, the continued decline of US-born cases contributed to a 32.7% decrease among Blacks, from 113 cases in 2006 to 76 cases in 2007. Hispanics saw an increase of 15.8% from 82 cases in 2006 to 95 cases in 2007. Whites and Asian/Pacific Islanders remained flat with 33 cases reported among Whites and 105 cases reported among Asian/Pacific Islanders.

### Age

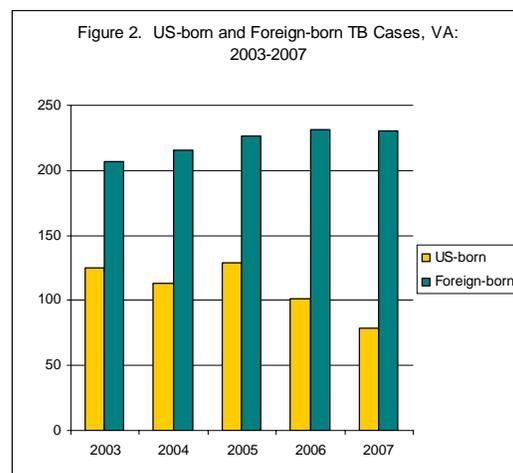
Seventeen pediatric cases, aged 0 to 14 were reported in 2007 as compared to 25 cases in 2006, a 32% decrease. Among the 15-24 year old age group, 43 cases were reported for a decrease of 15.7% from 2006. The 25-44 year old age group experienced an increase of 8.5% with 127 cases reported in 2007 as compared to 117 cases in 2006. Cases decreased 9.5% among those aged 45-64 from 84 in 2006 to 76 in 2007. Among those persons 65 and older, 46 cases were reported (Figure 1).



### Place of Origin

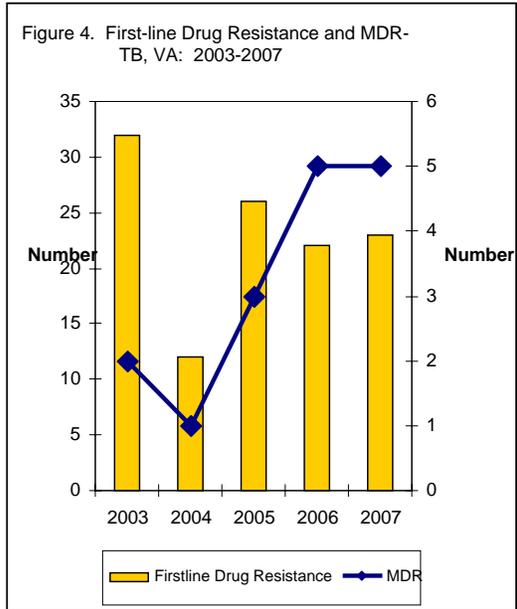
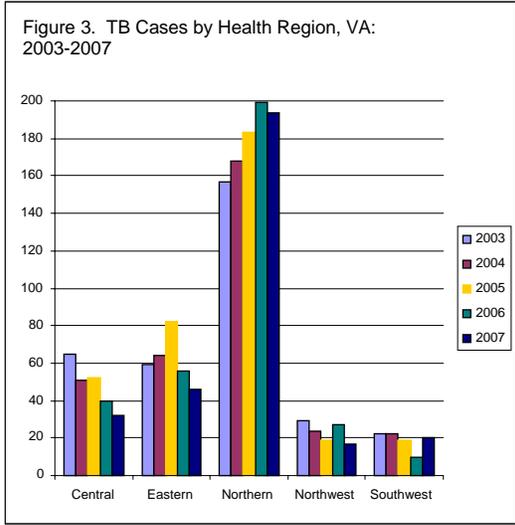
Since 2000, foreign-born cases have surpassed US-born cases. In 2007, 230 or 74.4% of Virginia's TB cases were reported among foreign-born persons (Figure 2). The continued decline in TB among US-born persons in Virginia mirrors the national trend.

The diversity of cultures and countries of origin among Virginia's TB cases is remarkable. These cases represent 42 countries of origin and speak 18 languages other than English. The top five countries of origin include the Philippines, El Salvador, India, Bolivia and Mexico.



### Geographic Distribution

With the exception of the Southwest health region, in 2007 all regions reported a decrease. Northern health region reported 194 cases representing 62.8% of the state total and a 2.6% decrease from 2006. Northwest, Central and Eastern reported decreases of 37%, 30% and 17.8%. The Southwest region saw a doubling of reported cases, from 10 in 2006 to 20 in 2007. The variation in cases reported year to year in low incidence areas is expected and extremely difficult to interpret (Figure 3).



**HIV Co-Infection and Selected Risk Factors**

Several risk factors are associated with TB including occupational risk, congregate living, co-infection with HIV, homelessness, and substance use. In 2007, six health care workers were reported with TB. TB was reported in two residents of long-term care facilities, six incarcerated persons and eight homeless persons. Overall, 3.2% of Virginia’s cases were reported with HIV infection as compared to 6.6% of cases in 2006. In 2007, 25 cases (8.1%) reported excessive alcohol use and 13 cases (4.2%) reported illicit drug use.

**Drug Resistance**

Two hundred nineteen TB cases were culture positive and had drug susceptibility testing performed. Drug resistance was found in 28 cases. Five 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 23 cases. No cases meeting the definition of extensively drug-resistant (XDR) TB were reported in 2007 (Figure 4).

**Mortality**

In 2007, six (1.9%) TB cases died during treatment and five (1.6%) cases were diagnosed at the time of death or post-mortem. This is a substantial decrease compared to previous years. The decline in cases among the elderly may explain some of the decrease in mortality seen this year.

**Treatment Outcomes**

For 2006, the year with the most complete data available, 90.5 % of the drug-susceptible cases completed therapy within 12 months.

**Contact Investigations**

In 2005, 2, 506 contacts to acid-fast bacilli (AFB) smear positive cases were identified. Of those, 95% were evaluated for infection and disease. Among the 702 people identified with latent TB infection (LTBI), 436 or 62% were started on treatment and 292 completed treatment for latent TB infection.

**Table 1. Number and Rate of Tuberculosis Cases: Virginia and United States, 1998-2007**

Year	Virginia		United States	
	No.	Rate	No.	Rate
1998	339	4.9	18,287	6.6
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

Historical US data: CDC. Reported Tuberculosis in the United States, 2005. Atlanta, GA: US DHHS, CDC, September 2006.  
 2007 US data from: Trends in Tuberculosis--United States, MMWR 2008; 57(11): 281.

**Table 2. Tuberculosis Cases and Rate per 100,000 by Health Region: Virginia, 2003-2007**

Region	2003			2004			2005			2006			2007		
	No.	%	Rate												
<b>Total</b>	<b>332</b>	<b>100</b>	<b>4.5</b>	<b>329</b>	<b>100</b>	<b>4.4</b>	<b>355</b>	<b>100</b>	<b>4.7</b>	<b>332</b>	<b>100</b>	<b>4.3</b>	<b>309</b>	<b>100</b>	<b>4.0</b>
Central	65	19.6	5.2	51	15.5	4.1	52	14.6	4.0	40	12.0	3.1	32	10.4	2.4
Eastern	59	17.8	3.3	64	19.5	3.6	82	23.1	4.6	56	16.9	3.1	46	14.9	2.6
Northern	157	47.3	8.1	168	51.1	8.5	183	51.5	9.0	199	59.9	9.7	194	62.8	9.3
Northwest	29	8.7	2.6	24	7.3	2.2	19	5.4	1.6	27	8.1	2.3	17	5.5	1.4
Southwest	22	6.6	1.7	22	6.7	1.7	19	5.4	1.4	10	3.0	0.8	20	6.5	1.5

**Table 3. Tuberculosis Cases by Demographics and Location: Virginia, 2003-2007**

Total Cases	2003		2004		2005		2006		2007	
	332		329		355		332		309	
	No	%								
<b>Sex</b>										
Female	133	40.1	162	49.2	173	48.7	142	42.8	129	41.7
Male	199	59.9	167	50.8	182	51.3	190	57.2	180	58.3
<b>Race/Ethnicity</b>										
Asian/Pacific Islander	105	31.6	98	29.8	106	29.9	105	31.6	105	34.0
Black, Not Hispanic	101	30.4	100	30.4	111	31.3	113	34.0	76	24.6
Hispanic	63	19.0	80	24.3	87	24.5	82	24.7	95	30.7
White, Not Hispanic	63	19.0	50	15.2	51	14.4	32	9.6	33	10.7
Other	0	0.0	1	0.30	0	0.0	0	0.0	0	0.0
<b>Age</b>										
0-14	19	5.7	20	6.1	26	7.3	25	7.5	17	5.5
15-24	47	14.2	36	10.9	40	11.3	51	15.4	43	13.9
25-44	115	34.6	128	38.9	142	40.0	117	35.2	127	41.1
45-64	89	26.8	83	25.2	78	22.0	84	25.3	76	24.6
>64	62	18.7	62	18.8	69	19.4	55	16.6	46	14.9
<b>Place of Birth</b>										
Foreign-born	207	62.3	216	65.7	225	63.4	230	69.3	230	74.4
US-born	125	37.7	113	34.3	130	36.6	102	30.7	79	25.6
<b>Health Region</b>										
Central	65	19.6	51	15.5	52	14.6	40	12.0	32	10.4
Eastern	59	17.8	64	19.5	82	23.1	56	16.9	46	14.9
Northern	157	47.3	168	51.1	183	51.5	199	59.9	194	62.8
Northwest	29	8.7	24	7.3	19	5.4	27	8.1	17	5.5
Southwest	22	6.6	22	6.7	19	5.4	10	3.0	20	6.5

**Table 4. Tuberculosis Cases by Demographics and Region: Central, 2003-2007**

	2003		2004		2005		2006		2007	
	<b>65</b>		<b>51</b>		<b>52</b>		<b>40</b>		<b>32</b>	
<b>Total Cases</b>	No.	%								
<b>Sex</b>										
Female	19	29.2	19	37.3	24	46.2	12	30.0	12	37.5
Male	46	70.8	32	62.7	28	53.8	28	70.0	20	62.5
<b>Race/Ethnicity</b>										
Asian/Pacific Islander	11	16.9	6	11.8	11	21.2	6	15.0	1	3.1
Black, Not Hispanic	37	56.9	28	54.9	27	51.9	24	60.0	19	59.4
Hispanic	9	13.8	10	19.6	5	9.6	3	7.5	8	25.0
White, Not Hispanic	8	12.3	7	13.7	9	17.3	7	17.5	4	12.5
<b>Age</b>										
0-14	1	1.5	2	3.9	4	7.7	2	5.0	2	6.3
15-24	6	9.2	6	11.8	6	11.5	3	7.5	8	25.0
25-44	21	32.3	18	35.3	18	34.6	12	30.0	8	25.0
45-64	28	43.1	19	37.3	16	30.8	14	35.0	9	28.1
>64	9	13.8	6	11.8	8	15.4	9	22.5	5	15.6
<b>Place of Birth</b>										
Foreign-born	22	33.8	21	41.2	18	34.6	11	27.5	13	40.6
US Born	43	66.2	30	58.8	34	65.4	29	72.5	19	59.4

**Table 5. Tuberculosis Cases by Demographics and Region: Eastern, 2003-2007**

	2003		2004		2005		2006		2007	
	<b>59</b>		<b>64</b>		<b>82</b>		<b>56</b>		<b>46</b>	
<b>Total Cases</b>	No.	%								
<b>Sex</b>										
Female	15	25.4	30	46.9	32	39.0	30	53.6	19	41.3
Male	44	74.6	34	53.1	50	61.0	26	46.4	27	58.7
<b>Race/Ethnicity</b>										
Asian/Pacific Islander	17	28.8	14	21.9	14	17.1	12	21.4	17	37.0
Black, Not Hispanic	27	45.8	29	45.3	45	54.9	33	58.9	19	41.3
Hispanic	4	6.8	5	7.8	9	11.0	9	16.1	4	8.7
White, Not Hispanic	11	18.6	16	25.0	14	17.1	2	3.6	6	13.0
<b>Age</b>										
0-14	0	0.0	2	3.1	7	8.5	5	8.9	1	2.2
15-24	4	6.8	2	3.1	6	7.3	9	16.1	1	2.2
25-44	16	27.1	21	32.8	30	36.6	12	21.4	13	28.3
45-64	15	25.4	22	34.4	16	19.5	13	23.2	21	45.7
>64	24	40.7	17	26.6	23	28.0	17	30.4	10	21.7
<b>Place of Birth</b>										
Foreign-born	22	37.3	22	34.4	29	35.4	20	35.7	20	43.5
US-born	37	62.7	42	65.6	53	64.6	36	64.3	26	56.5

**Table 6. Tuberculosis Cases by Demographics and Region: Northern, 2003-2007**

	2003		2004		2005		2006		2007	
	<b>157</b>		<b>168</b>		<b>183</b>		<b>199</b>		<b>194</b>	
<b>Total Cases</b>	No.	%								
<b>Sex</b>										
Female	86	54.8	91	54.2	104	56.8	90	45.2	85	43.8
Male	71	45.2	77	45.8	79	43.2	109	54.8	109	56.2
<b>Race/Ethnicity</b>										
Asian/Pacific Islander	72	45.9	73	43.5	78	42.6	85	42.7	81	41.8
Black, Not Hispanic	30	19.1	34	20.2	26	14.2	48	24.1	29	14.9
Hispanic	35	22.3	52	31.0	66	36.1	54	27.1	77	39.7
White, Not Hispanic	20	12.7	9	5.4	13	7.1	12	6.0	7	3.6
<b>Age</b>										
0-14	11	7.0	10	6.0	13	7.1	14	7.0	12	6.2
15-24	27	17.2	24	14.3	22	12.0	34	17.1	30	15.5
25-44	68	43.3	76	45.2	87	47.5	81	40.7	94	48.5
45-64	32	20.4	31	18.5	33	18.0	48	24.1	38	19.6
>64	19	12.1	27	16.1	28	15.3	22	11.1	20	10.3
<b>Place of Birth</b>										
Foreign-born	143	91.1	154	91.7	163	89.1	179	89.9	179	92.3
US-born	14	8.9	14	8.3	20	10.9	20	10.1	15	7.7

**Table 7. Tuberculosis Cases by Demographics and Region: Northwest, 2003-2007**

	2003		2004		2005		2006		2007	
	<b>29</b>		<b>24</b>		<b>19</b>		<b>27</b>		<b>17</b>	
<b>Total Cases</b>	No.	%								
<b>Sex</b>										
Female	9	31.0	12	50.0	9	47.4	9	33.3	8	47.1
Male	20	69.0	12	50.0	10	52.6	18	66.7	9	52.9
<b>Race/Ethnicity</b>										
Asian/Pacific Islander	3	10.3	4	17.4	1	5.3	2	7.4	4	23.5
Black, Not Hispanic	3	10.3	3	13.0	8	42.1	7	25.9	3	17.6
Hispanic	14	48.3	11	47.8	5	26.3	15	55.6	4	23.5
White, Not Hispanic	9	31.0	5	21.7	5	26.3	3	11.1	6	35.3
Other	na	na	1	4.2	0	0.0	0	0.0	0	0.0
<b>Age</b>										
0-14	3	10.3	4	16.7	1	5.3	3	11.1	0	0.0
15-24	8	27.6	4	16.7	5	26.3	4	14.8	0	0.0
25-44	6	20.7	8	33.3	3	15.8	10	37.0	9	52.9
45-64	7	24.1	7	29.2	8	42.1	6	22.2	5	29.4
>64	5	17.2	1	4.2	2	10.5	4	14.8	3	17.6
<b>Place of Birth</b>										
Foreign-born	18	62.1	15	62.5	9	47.4	20	74.1	10	58.8
US-born	11	37.9	9	37.5	10	52.6	7	25.9	7	41.2

**Table 8. Tuberculosis Cases by Demographics and Region: Southwest, 2003-2007**

Total Cases	2003		2004		2005		2006		2007	
	22		22		19		10		20	
	No.	%	No.	%	No.	%	No.	%	No.	%
<b>Sex</b>										
Female	4	18.2	10	45.5	4	21.1	1	10.0	5	25.0
Male	18	81.8	12	54.5	15	78.9	9	90.0	15	75.0
<b>Race/Ethnicity</b>										
Asian/Pacific Islander	2	9.1	1	4.5	2	10.5	0	0.0	2	10.0
Black, Not Hispanic	4	18.2	6	27.3	4	21.1	1	10.0	6	30.0
Hispanic	1	4.5	2	9.1	2	10.5	1	10.0	2	10.0
White, Not Hispanic	15	68.2	13	59.1	11	57.9	8	80.0	10	50.0
<b>Age</b>										
0-14	4	18.2	2	9.1	1	5.3	1	10.0	2	10.0
15-24	2	9.1	0	0.0	1	5.3	1	10.0	4	20.0
25-44	4	18.2	5	22.7	4	21.1	2	20.0	3	15.0
45-64	7	31.8	4	18.2	5	26.3	3	30.0	3	15.0
>64	5	22.7	11	50.0	8	42.1	3	30.0	8	40.0
<b>Place of Birth</b>										
Foreign-born	2	9.1	4	18.2	6	31.6	0	0.0	8	40.0
US-born	20	90.9	18	81.8	13	68.4	10	100.0	12	60.0

**Table 9. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Virginia, 2003-2007**

Race/Ethnicity	2003		2004		2005		2006		2007	
	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born
<b>Total</b>	<b>125</b>	<b>207</b>	<b>113</b>	<b>216</b>	<b>129</b>	<b>226</b>	<b>101</b>	<b>231</b>	<b>79</b>	<b>230</b>
Asian/Pacific Islander	5	100	3	95	5	101	5	100	3	102
Black, Not Hispanic	68	33	64	36	76	36	62	51	45	31
Hispanic	4	59	6	74	8	79	8	74	5	90
White, Not Hispanic	48	15	40	10	40	10	26	6	26	7
Other	0	0	0	1	0	0	0	0	0	0

**Table 10. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Central Region, 2003-2007**

Race/Ethnicity	2003		2004		2005		2006		2007	
	US-born	Foreign-born								
<b>Total</b>	<b>43</b>	<b>22</b>	<b>30</b>	<b>21</b>	<b>34</b>	<b>18</b>	<b>29</b>	<b>11</b>	<b>19</b>	<b>13</b>
Asian/Pacific Islander	0	11	0	6	2	9	0	6	0	1
Black, Not Hispanic	34	3	24	4	24	3	21	3	14	5
Hispanic	1	8	0	10	0	5	1	2	1	7
White, Not Hispanic	8	0	6	1	8	1	7	0	4	0

**Table 11. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Eastern Region, 2003-2007**

Race/Ethnicity	2003		2004		2005		2006		2007	
	US-born	Foreign-born								
<b>Total</b>	<b>37</b>	<b>22</b>	<b>42</b>	<b>22</b>	<b>53</b>	<b>29</b>	<b>36</b>	<b>20</b>	<b>26</b>	<b>20</b>
Asian/Pacific Islander	0	17	1	13	1	13	1	11	1	16
Black, Not Hispanic	27	0	27	2	39	6	32	1	19	0
Hispanic	0	4	0	5	0	9	1	8	1	3
White, Not Hispanic	10	1	14	2	13	1	2	0	5	1

**Table 12. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Northern Region, 2003-2007**

Race/Ethnicity	2003		2004		2005		2006		2007	
	US-born	Foreign-born								
<b>Total</b>	<b>14</b>	<b>143</b>	<b>14</b>	<b>154</b>	<b>20</b>	<b>163</b>	<b>20</b>	<b>179</b>	<b>15</b>	<b>179</b>
Asian/Pacific Islander	2	70	2	71	2	76	4	81	2	79
Black, Not Hispanic	3	27	6	28	3	23	4	44	7	22
Hispanic	2	33	3	49	8	58	4	50	3	74
White, Not Hispanic	7	13	3	6	7	6	8	4	3	4

**Table 13. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Northwest Region, 2003-2007**

Race/Ethnicity	2003		2004		2005		2006		2007	
	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born
<b>Total</b>	<b>11</b>	<b>18</b>	<b>9</b>	<b>15</b>	<b>10</b>	<b>9</b>	<b>7</b>	<b>20</b>	<b>7</b>	<b>10</b>
Asian/Pacific Islander	1	2	0	4	0	1	0	2	0	4
Black, Not Hispanic	1	2	2	1	5	3	4	3	2	1
Hispanic	1	13	3	8	0	5	1	14	0	4
White, Not Hispanic	8	1	4	1	5	0	2	1	5	1
Other	0	0	0	1	0	0	0	0	0	0

**Table 14. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Southwest Region, 2003-2007**

Race/Ethnicity	2003		2004		2005		2006		2007	
	US-born	Foreign-born								
<b>Total</b>	<b>20</b>	<b>2</b>	<b>18</b>	<b>4</b>	<b>13</b>	<b>6</b>	<b>10</b>	<b>0</b>	<b>12</b>	<b>8</b>
Asian/Pacific Islander	2	0	0	1	0	2	0	0	0	2
Black, Not Hispanic	3	1	5	1	3	1	1	0	0	3
Hispanic	0	1	0	2	0	2	1	0	3	2
White, Not Hispanic	15	0	13	0	10	1	8	0	9	1

**Table 15. Tuberculosis Cases by Selected Risk Factors: Virginia, 2003-2007**

Total Cases	2003		2004		2005		2006		2007	
	332		329		355		332		309	
	No.	%								
<b>Occupation</b>										
Health Care	8	2.4	6	1.8	7	2.0	6	1.8	5	1.6
Migrant	3	0.9	3	0.9	4	1.1	1	0.3	0	0.0
Corrections	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
<b>Type of Residence</b>										
Long Term Care	24	7.2	15	4.6	13	3.7	13	3.9	2	0.6
Prison/Jail	6	1.8	7	2.1	8	2.3	4	1.2	6	1.9
Homeless	12	3.6	7	2.1	6	1.7	2	0.6	8	2.6
<b>Co-Morbidity</b>										
HIV	21	6.3	15	4.6	21	5.9	22	6.6	10	3.2
<b>Substance Use</b>										
Alcohol	33	9.9	29	8.8	34	9.6	28	8.4	25	8.1
IDU	8	2.4	3	0.9	2	0.6	6	1.8	5	1.6
Non-IDU	4	1.2	9	2.7	12	3.4	9	2.7	8	2.6

**Table 16. Tuberculosis Cases by Selected Risk Factors: Central Region, 2003-2007**

Total Cases	2003		2004		2005		2006		2007	
	65		51		52		40		32	
	No.	%								
<b>Occupation</b>										
Health Care	3	6.7	0	0.0	0	0.0	1	2.5	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
<b>Type of Residence</b>										
Long Term Care	4	8.9	2	3.9	3	5.8	1	2.5	0	0.0
Prison/Jail	1	2.2	0	0.0	2	3.8	0	0.0	2	6.3
Homeless	6	13.3	1	2.0	1	1.9	2	5.0	1	3.1
<b>Co-Morbidity</b>										
HIV	4	8.9	4	7.8	5	9.6	6	15.0	0	0.0
<b>Substance Use</b>										
Alcohol	12	26.7	7	13.7	7	13.5	8	20.0	4	12.5
IDU	3	6.7	1	2.0	0	0.0	6	15.0	0	0.0
Non-IDU	2	4.4	1	2.0	4	7.7	1	2.5	3	9.4

**Table 17. Tuberculosis Cases by Selected Risk Factors: Eastern Region, 2003-2007**

Total Cases	2003		2004		2005		2006		2007	
	59		64		82		56		46	
	No.	%	No.	%	No.	%	No.	%	No.	%
<b>Occupation</b>										
Health Care	1	1.7	2	3.1	1	1.2	0	0.0	1	2.2
Migrant	2	3.4	3	4.7	4	4.9	1	1.8	0	0.0
Corrections	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
<b>Type of Residence</b>										
Long Term Care	3	5.1	1	1.6	1	1.2	2	3.6	1	2.2
Prison/Jail	1	1.7	1	1.6	2	2.4	0	0.0	0	0.0
Homeless	3	5.1	2	3.1	3	3.7	0	0.0	2	4.3
<b>Co-Morbidity</b>										
HIV	3	5.1	5	7.8	6	7.3	4	7.1	3	6.5
<b>Substance Use</b>										
Alcohol	7	11.9	2	3.1	14	17.1	3	5.4	4	8.7
IDU	3	5.1	0	0.0	1	1.2	0	0.0	0	0.0
Non-IDU	0	0.0	1	1.6	5	6.1	3	5.4	4	8.7

**Table 18. Tuberculosis Cases by Selected Risk Factors: Northern Region, 2003-2007**

Total Cases	2003		2004		2005		2006		2007	
	157		168		183		198		194	
	No.	%								
<b>Occupation</b>										
Health Care	2	1.3	3	1.8	5	2.7	5	2.5	3	1.5
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
<b>Type of Residence</b>										
Long Term Care	15	9.6	8	4.8	7	3.8	3	1.5	0	0.0
Prison/Jail	3	1.9	1	0.6	2	1.1	1	0.5	1	0.5
Homeless	3	1.9	4	2.4	1	0.5	0	0.0	5	2.6
<b>Co-Morbidity</b>										
HIV	12	7.6	5	3.0	9	4.9	10	5.1	4	2.1
<b>Substance Use</b>										
Alcohol	5	3.2	7	4.2	5	2.7	5	2.5	8	4.1
IDU	2	1.3	2	1.2	0	0.0	0	0.0	1	0.5
Non-IDU	2	1.3	3	1.8	1	0.5	2	1.0	2	1.0

**Table 19. Tuberculosis Cases by Selected Risk Factors: Northwest Region, 2003-2007**

Total Cases	2003		2004		2005		2006		2007	
	29		24		19		28		17	
	No.	%	No.	%	No.	%	No.	%	No.	%
<b>Occupation</b>										
Health Care	1	3.4	3	12.5	1	5.3	0	0.0	1	5.9
Migrant	1	3.4	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
<b>Type of Residence</b>										
Long Term Care	2	6.9	2	8.3	0	0.0	4	14.3	0	0.0
Prison/Jail	1	3.4	1	4.2	1	5.3	3	10.7	1	5.9
Homeless	0	0.0	0	0.0	1	5.3	0	0.0	0	0.0
<b>Co-Morbidity</b>										
HIV	1	3.4	0	0.0	0	0.0	2	7.1	2	11.8
<b>Substance Use</b>										
Alcohol	4	13.8	7	29.2	1	5.3	7	25.0	3	17.6
IDU	0	0.0	0	0.0	0	0.0	0	0.0	2	0.0
Non-IDU	0	0.0	2	8.3	1	5.3	1	3.6	1	5.9

**Table 20. Tuberculosis Cases by Selected Risk Factors: Southwest Region, 2003-2007**

Total Cases	2003		2004		2005		2006		2007	
	22		22		19		10		20	
	No.	%								
<b>Occupation</b>										
Health Care	1	4.5	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
<b>Type of Residence</b>										
Long Term Care	0	0.0	3	13.6	2	10.5	3	30.0	1	5.0
Prison/Jail	0	0.0	2	9.1	1	5.3	0	0.0	2	10.0
Homeless	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
<b>Co-Morbidity</b>										
HIV	1	4.5	1	4.5	0	0.0	0	0.0	1	5.0
<b>Substance Use</b>										
Alcohol	5	22.7	6	27.3	6	31.6	4	40.0	5	25.0
IDU	0	0.0	0	0.0	1	5.3	0	0.0	2	11.8
Non-IDU	0	0.0	2	9.1	1	5.3	2	20.0	0	0.0

**Table 21. Culture Positive Tuberculosis Cases with Drug Resistance: Virginia, 2003-2007**

Initial Susceptibilities	2003		2004*		2005		2006		2007	
	<b>246</b>		<b>254</b>		<b>260</b>		<b>253</b>		<b>219</b>	
	No.	%	No.	%	No.	%	No.	%	No.	%
<b>Total Drug Resistance</b>	<b>34</b>	<b>13.8</b>	<b>13</b>	<b>5.1</b>	<b>29</b>	<b>11.2</b>	<b>27</b>	<b>10.7</b>	<b>28</b>	<b>12.8</b>
Any first line drug	32	13.0	12	4.7	26	10.0	22	8.7	23	10.5
Multidrug**	2	0.8	1	0.4	3	1.2	5	2.0	5	2.3

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

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

**Table 22. Tuberculosis Mortality: Virginia, 2003-2007**

Total Cases	2003		2004		2005		2006		2007	
	<b>332</b>		<b>329</b>		<b>355</b>		<b>332</b>		<b>309</b>	
	No.	%								
<b>Total Deaths*</b>	<b>26</b>	<b>6.3</b>	<b>26</b>	<b>7.9</b>	<b>31</b>	<b>8.7</b>	<b>27</b>	<b>8.1</b>	<b>11</b>	<b>3.6</b>
Dead at Time Diagnosis	4	1.3	7	2.1	6	1.7	11	3.3	5	1.6
Died During Treatment	22	5.1	19	5.8	25	7.0	16	4.8	6	1.9

\*If a person is diagnosed with TB post-mortem or diagnosed with TB at the time of death they are coded as dead at the time of diagnosis. If they died during TB treatment, they are coded as died during treatment. There may be people in either of these categories whose underlying cause of death is not TB.

## 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 Definition<sup>1</sup>**

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.

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<sup>1</sup> 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.