

# 2006 Annual Tuberculosis Surveillance Report

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## ***Introduction***

In 2006, Virginia reported 332 *Mycobacterium tuberculosis* (TB) cases, a 6.5% decrease over 2005. While overall reports of TB declined in 2006, Virginia ranks 9<sup>th</sup> in the nation for reported cases and TB remains a problem of public health significance. Data on demographics and selected risk factors are provided at the state and health region level for 2002 to 2006. We invite you to pay attention to marginal changes in the five-year data provided in this report. For example, compared to 2005, cases among females decreased slightly, cases among those aged 15-24 increased and cases among foreign-born increased.

## ***Demographic Characteristics***

In 2006, 42.8% of TB cases were female and 57.2% were male. Compared to 2005, TB cases among Asian/Pacific Islanders, Blacks and Hispanics were relatively stable with marginal changes reported in these groups. Among Whites, cases shrank from 51 to 32, for a 37.3% decrease.

Twenty-five pediatric cases, aged 0 to 14 were reported in 2006 as compared to 26 cases in 2004, a 4% decrease. Among the 15-24 year old age group, 51 cases were reported for a substantial increase of 27.5% over 2005. The 25-44 year old age group experienced a decrease of 17.6% with 51 cases reported in 2006 as compared to 142 cases in 2005. Cases increased 7.7% among those aged 45-64 from 78 in 2005 to 84 in 2006. Among those persons 65 and older, 55 cases were reported, the lowest number of cases in that age group in five years.

In 2006, 230 or 69.3% of Virginia's TB cases were reported among foreign-born persons. The diversity of cultures and countries of origin among Virginia's TB cases is remarkable. These cases represent 43 countries of origin and speak 18 languages other than English. The top five countries of origin included Vietnam, Mexico, Ethiopia, the Philippines and South Korea.

The small demographic shifts and plateaus that we see in 2006 are good indicators of a stable TB problem in Virginia. Like the rest of the country, Virginia experienced a decline in cases reported among US-born Whites and Blacks and a persistent number of new cases among the foreign-born.

## ***Geographic Distribution***

In 2006, Northern health region reported 199 cases representing 59.9% of all the cases reported and an 8.7% increase over 2005. Northwest region also reported an increase with 27 cases reported as compared to 19 in 2005. Eastern, Central and Southwest health regions reported decreases compared to 2005.

The distribution of TB cases by health region mirrors the distribution of Virginia's population by race and country of origin. TB cases in Central, Eastern and Southwest health regions are largely US-born, with 72.5%, 64.3% and 100% of cases respectively reported in this group. Northern and Northwest regions by contrast report 89.9% and 74.1% of their cases among the foreign-born. In the Southwest, 80% of the cases occurred among white residents, while in Central and Eastern the majority of cases occurred among Black residents.

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

Several risk factors are associated with TB including occupational risk, congregate living, co-infection with HIV, and substance use. In 2006, six health care workers and one migrant worker were reported with TB. Thirteen residents of long-term care facilities were reported, four cases were reported among prison or jail inmates, and two cases were reported among homeless persons. Among the 264 cases with documented HIV test results, 8.3% were infected with HIV,

and 68% of these cases were aged 25-44. Overall, 6.6% of Virginia's cases were reported with HIV infection as compared to 5.9% of cases in 2005. In 2006, 28 cases (8.4%) reported excessive alcohol use and 15 cases (4.5%) reported injection drug use (IDU) or non-injection drug use.

### ***Drug Resistance***

Two hundred fifty-three TB cases were culture positive and had drug susceptibility testing performed. Drug resistance was found in 27 cases. Five cases of multidrug-resistant TB (MDR-TB) were reported. (By definition MDR-TB is resistant to isoniazid and rifampin). Resistance to at least one first-line drug, most frequently isoniazid, was found in 22 cases. No cases meeting the definition of extensively drug-resistant (XDR) TB were diagnosed in 2006.

### ***Mortality***

In 2006, 16 (4.8%) TB cases died during treatment and 11(3.3%) cases were diagnosed at the time of death or post-mortem. Late entry into treatment, other underlying medical conditions, and other causes of death may have contributed to these deaths.

### ***Treatment Outcomes***

For 2005, the year with the most complete data available, 90.3% of the drug-susceptible cases completed therapy within 12 months. Patients who died at diagnosis or during treatment, and patients who had drug resistance to rifampin are not included in the completion of therapy calculation.

### ***Contact Investigations***

In 2004, contacts were identified for 94% of the newly reported acid-fast bacilli (AFB) smear positive cases. Of those, 93% were evaluated for infection and disease. Among the 434 people identified with latent TB infection (LTBI), 251 or 58% were started on treatment. Among these contacts, 169 or 67% completed treatment for latent TB infection.

**Table 1. Number and Rate of Tuberculosis Cases: Virginia and United States, 1997-2006**

Year	Virginia		United States	
	No.	Rate	No.	Rate
1997	349	5.1	19,757	7.2
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

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

2006 US data from: Trends in Tuberculosis--United States, 2007. MMWR March 23, 2007; 56(11): 245.

**Table 2. Tuberculosis Cases and Rate per 100,000 by Health Region: Virginia, 2002-2006**

Region	2002			2003			2004			2005			2006		
	No.	%	Rate												
<b>Total</b>	<b>315</b>	<b>100</b>	<b>4.5</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>
Central	45	14.3	3.8	65	19.6	5.2	51	15.5	4.1	52	14.6	4.0	40	12.0	3.1
Eastern	53	16.8	3.1	59	17.8	3.3	64	19.5	3.6	82	23.1	4.6	56	16.9	3.1
Northern	177	56.2	9.8	157	47.3	8.1	168	51.1	8.5	183	51.5	9.0	199	59.9	9.7
Northwest	15	4.8	1.5	29	8.7	2.6	24	7.3	2.2	19	5.4	1.6	27	8.1	2.3
Southwest	25	7.9	1.9	22	6.6	1.7	22	6.7	1.7	19	5.4	1.4	10	3.0	0.8

**Table 3. Tuberculosis Cases by Demographics and Location: Virginia, 2002-2006**

	2002		2003		2004		2005		2006	
	<b>315</b>		<b>332</b>		<b>329</b>		<b>355</b>		<b>332</b>	
<b>Total Cases</b>	No.	%								
<b>Sex</b>										
Female	137	43.5	133	40.1	162	49.2	173	48.7	142	42.8
Male	178	56.5	199	59.9	167	50.8	182	51.3	190	57.2
<b>Race/Ethnicity</b>										
Asian/Pacific Islander	94	29.8	105	31.6	98	29.8	106	29.9	105	31.6
Black, Not Hispanic	86	27.3	101	30.4	100	30.4	111	31.3	113	34.0
Hispanic	69	21.9	63	19.0	80	24.3	87	24.5	82	24.7
White, Not Hispanic	66	21.0	63	19.0	50	15.2	51	14.4	32	9.6
Other	0	0.0	0	0.0	1	0.30	0	0.0	0	0.0
<b>Age</b>										
0-14	16	5.1	19	5.7	20	6.1	26	7.3	25	7.5
15-24	36	11.4	47	14.2	36	10.9	40	11.3	51	15.4
25-44	114	36.2	115	34.6	128	38.9	142	40.0	117	35.2
45-64	83	26.3	89	26.8	83	25.2	78	22.0	84	25.3
>64	66	21.0	62	18.7	62	18.8	69	19.4	55	16.6
<b>Place of Birth</b>										
Foreign-born	189	60.0	207	62.3	216	65.7	225	63.4	230	69.3
US-born	126	40.0	125	37.7	113	34.3	130	36.6	102	30.7
<b>Health Region</b>										
Central	45	14.3	65	19.6	51	15.5	52	14.6	40	12.0
Eastern	53	16.8	59	17.8	64	19.5	82	23.1	56	16.9
Northern	177	56.2	157	47.3	168	51.1	183	51.5	199	59.9
Northwest	15	4.8	29	8.7	24	7.3	19	5.4	27	8.1
Southwest	25	7.9	22	6.6	22	6.7	19	5.4	10	3.0

**Table 4. Tuberculosis Cases by Demographics and Region: Central, 2002-2006**

	2002		2003		2004		2005		2006	
	<b>45</b>		<b>65</b>		<b>51</b>		<b>52</b>		<b>40</b>	
<b>Total Cases</b>	No.	%								
<b>Sex</b>										
Female	24	53.3	19	29.2	19	37.3	24	46.2	12	30.0
Male	21	46.7	46	70.8	32	62.7	28	53.8	28	70.0
<b>Race/Ethnicity</b>										
Asian/Pacific Islander	7	15.6	11	16.9	6	11.8	11	21.2	6	15.0
Black, Not Hispanic	25	55.6	37	56.9	28	54.9	27	51.9	24	60.0
Hispanic	3	6.7	9	13.8	10	19.6	5	9.6	3	7.5
White, Not Hispanic	10	22.2	8	12.3	7	13.7	9	17.3	7	17.5
<b>Age</b>										
0-14	1	2.2	1	1.5	2	3.9	4	7.7	2	5.0
15-24	3	6.7	6	9.2	6	11.8	6	11.5	3	7.5
25-44	9	20.0	21	32.3	18	35.3	18	34.6	12	30.0
45-64	21	46.7	28	43.1	19	37.3	16	30.8	14	35.0
>64	11	24.4	9	13.8	6	11.8	8	15.4	9	22.5
<b>Place of Birth</b>										
Foreign-born	12	26.7	22	33.8	21	41.2	18	34.6	11	27.5
US Born	33	73.3	43	66.2	30	58.8	34	65.4	29	72.5

**Table 5. Tuberculosis Cases by Demographics and Region: Eastern, 2002-2006**

	2002		2003		2004		2005		2006	
	<b>53</b>		<b>59</b>		<b>64</b>		<b>82</b>		<b>56</b>	
<b>Total Cases</b>	No.	%								
<b>Sex</b>										
Female	22	41.5	15	25.4	30	46.9	32	39.0	30	53.6
Male	31	58.5	44	74.6	34	53.1	50	61.0	26	46.4
<b>Race/Ethnicity</b>										
Asian/Pacific Islander	10	18.9	17	28.8	14	21.9	14	17.1	12	21.4
Black, Not Hispanic	28	52.8	27	45.8	29	45.3	45	54.9	33	58.9
Hispanic	4	7.5	4	6.8	5	7.8	9	11.0	9	16.1
White, Not Hispanic	11	20.8	11	18.6	16	25.0	14	17.1	2	3.6
<b>Age</b>										
0-14	0	0.0	0	0.0	2	3.1	7	8.5	5	8.9
15-24	3	5.7	4	6.8	2	3.1	6	7.3	9	16.1
25-44	11	20.8	16	27.1	21	32.8	30	36.6	12	21.4
45-64	24	45.3	15	25.4	22	34.4	16	19.5	13	23.2
>64	15	28.3	24	40.7	17	26.6	23	28.0	17	30.4
<b>Place of Birth</b>										
Foreign-born	15	28.3	22	37.3	22	34.4	29	35.4	20	35.7
US-born	38	71.7	37	62.7	42	65.6	53	64.6	36	64.3

**Table 6. Tuberculosis Cases by Demographics and Region: Northern, 2002-2006**

	2002		2003		2004		2005		2006	
	<b>177</b>		<b>157</b>		<b>168</b>		<b>183</b>		<b>199</b>	
<b>Total Cases</b>	No.	%								
<b>Sex</b>										
Female	77	43.5	86	54.8	91	54.2	104	56.8	90	45.2
Male	100	56.5	71	45.2	77	45.8	79	43.2	109	55.1
<b>Race/Ethnicity</b>										
Asian/Pacific Islander	73	41.2	72	45.9	73	43.5	78	42.6	85	42.7
Black, Not Hispanic	26	14.7	30	19.1	34	20.2	26	14.2	48	24.1
Hispanic	59	33.3	35	22.3	52	31.0	66	36.1	54	27.1
White, Not Hispanic	19	10.7	20	12.7	9	5.4	13	7.1	12	6.0
<b>Age</b>										
0-14	14	7.9	11	7.0	10	6.0	13	7.1	14	7.0
15-24	28	15.8	27	17.2	24	14.3	22	12.0	34	17.1
25-44	84	47.5	68	43.3	76	45.2	87	47.5	81	40.7
45-64	25	14.1	32	20.4	31	18.5	33	18.0	48	24.1
>64	26	14.7	19	12.1	27	16.1	28	15.3	22	11.1
<b>Place of Birth</b>										
Foreign-born	154	87.0	143	91.1	154	91.7	163	89.1	179	89.9
US-born	23	13.0	14	8.9	14	8.3	20	10.9	20	10.1

**Table 7. Tuberculosis Cases by Demographics and Region: Northwest, 2002-2006**

	2002		2003		2004		2005		2006	
	<b>15</b>		<b>29</b>		<b>24</b>		<b>19</b>		<b>27</b>	
<b>Total Cases</b>	No.	%								
<b>Sex</b>										
Female	5	33.3	9	31.0	12	50.0	9	47.4	9	33.3
Male	10	66.7	20	69.0	12	50.0	10	52.6	18	66.7
<b>Race/Ethnicity</b>										
Asian/Pacific Islander	2	13.3	3	10.3	4	17.4	1	5.3	2	7.4
Black, Not Hispanic	0	0.0	3	10.3	3	13.0	8	42.1	7	25.9
Hispanic	3	20.0	14	48.3	11	47.8	5	26.3	15	55.6
White, Not Hispanic	10	66.7	9	31.0	5	21.7	5	26.3	3	11.1
Other	na	na	na	na	1	4.2	0	0.0	0	0.0
<b>Age</b>										
0-14	0	0.0	3	10.3	4	16.7	1	5.3	3	11.1
15-24	2	13.3	8	27.6	4	16.7	5	26.3	4	14.8
25-44	3	20.0	6	20.7	8	33.3	3	15.8	10	37.0
45-64	5	33.3	7	24.1	7	29.2	8	42.1	6	22.2
>64	5	33.3	5	17.2	1	4.2	2	10.5	4	14.8
<b>Place of Birth</b>										
Foreign-born	6	40.0	18	62.1	15	62.5	9	47.4	20	74.1
US-born	9	60.0	11	37.9	9	37.5	10	52.6	7	25.9

**Table 8. Tuberculosis Cases by Demographics and Region: Southwest, 2002-2006**

	2002		2003		2004		2005		2006	
	<b>25</b>		<b>22</b>		<b>22</b>		<b>19</b>		<b>10</b>	
<b>Total Cases</b>	No.	%								
<b>Sex</b>										
Female	9	36.0	4	18.2	10	45.5	4	21.1	1	10.0
Male	16	64.0	18	81.8	12	54.5	15	78.9	9	90.0
<b>Race/Ethnicity</b>										
Asian/Pacific Islander	2	8.0	2	9.1	1	4.5	2	10.5	0	0.0
Black, Not Hispanic	9	36.0	4	18.2	6	27.3	4	21.1	1	10.0
Hispanic	0	0.0	1	4.5	2	9.1	2	10.5	1	10.0
White, Not Hispanic	14	56.0	15	68.2	13	59.1	11	57.9	8	80.0
<b>Age</b>										
0-14	1	4.0	4	18.2	2	9.1	1	5.3	1	10.0
15-24	0	0.0	2	9.1	0	0.0	1	5.3	1	10.0
25-44	7	28.0	4	18.2	5	22.7	4	21.1	2	20.0
45-64	8	32.0	7	31.8	4	18.2	5	26.3	3	30.0
>64	9	36.0	5	22.7	11	50.0	8	42.1	3	30.0
<b>Place of Birth</b>										
Foreign-born	2	8.0	2	9.1	4	18.2	6	31.6	0	0.0
US-born	23	92.0	20	90.9	18	81.8	13	68.4	10	100.0

**Table 9. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Virginia, 2002-2006**

Race/Ethnicity	2002		2003		2004		2005		2006	
	US-born	Foreign-born								
<b>Total</b>	<b>126</b>	<b>189</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>
Asian/Pacific Islander	0	94	5	100	3	95	5	101	5	100
Black, Not Hispanic	62	24	68	33	64	36	76	36	62	51
Hispanic	9	60	4	59	6	74	8	79	8	74
White, Not Hispanic	55	11	48	15	40	10	40	10	26	6
Other	0	0	0	0	0	1	0	0	0	0

**Table 10. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Central Region, 2002-2006**

Race/Ethnicity	2002		2003		2004		2005		2006	
	US-born	Foreign-born								
<b>Total</b>	<b>33</b>	<b>12</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>
Asian/Pacific Islander	0	7	0	11	0	6	2	9	0	6
Black, Not Hispanic	24	1	34	3	24	4	24	3	21	3
Hispanic	0	3	1	8	0	10	0	5	1	2
White, Not Hispanic	9	1	8	0	6	1	8	1	7	0

**Table 11. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Eastern Region, 2002-2006**

Race/Ethnicity	2002		2003		2004		2005		2006	
	US-born	Foreign-born								
<b>Total</b>	<b>38</b>	<b>15</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>
Asian/Pacific Islander	0	10	0	17	1	13	1	13	1	11
Black, Not Hispanic	26	1	27	0	27	2	39	6	32	1
Hispanic	0	4	0	4	0	5	0	9	1	8
White, Not Hispanic	12	0	10	1	14	2	13	1	2	0

**Table 12. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Northern Region, 2002-2006**

Race/Ethnicity	2002		2003		2004		2005		2006	
	US-born	Foreign-born								
<b>Total</b>	<b>23</b>	<b>154</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>
Asian/Pacific Islander	0	73	2	70	2	71	2	76	4	81
Black, Not Hispanic	4	22	3	27	6	28	3	23	4	44
Hispanic	9	50	2	33	3	49	8	58	4	50
White, Not Hispanic	10	9	7	13	3	6	7	6	8	4

**Table 13. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Northwest Region, 2002-2006**

Race/Ethnicity	2002		2003		2004		2005		2006	
	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born
<b>Total</b>	<b>9</b>	<b>6</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>
Asian/Pacific Islander	0	2	1	2	0	4	0	1	0	2
Black, Not Hispanic	0	0	1	2	2	1	5	3	4	3
Hispanic	0	3	1	13	3	8	0	5	1	14
White, Not Hispanic	9	1	8	1	4	1	5	0	2	1
Other	0	0	0	0	0	1	0	0	0	0

**Table 14. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Southwest Region, 2002-2006**

Race/Ethnicity	2002		2003		2004		2005		2006	
	US-born	Foreign-born								
<b>Total</b>	<b>23</b>	<b>2</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>
Asian/Pacific Islander	0	2	2	0	0	1	0	2	0	0
Black, Not Hispanic	8	0	3	1	5	1	3	1	1	0
Hispanic	0	0	0	1	0	2	0	2	1	0
White, Not Hispanic	15	0	15	0	13	0	10	1	8	0

**Table 15. Tuberculosis Cases by Selected Risk Factors: Virginia, 2002-2006**

Total Cases	2002		2003		2004		2005		2006	
	315		332		329		355		332	
	No.	%								
<b>Occupation</b>										
Health Care	10	3.2	8	2.4	6	1.8	7	2.0	6	1.8
Migrant	3	1	3	0.9	3	0.9	4	1.1	1	0.3
Corrections	1	0.3	0	0.0	0	0.0	0	0.0	0	0.0
<b>Type of Residence</b>										
Long Term Care	18	5.7	24	7.2	15	4.6	13	3.7	13	3.9
Prison/Jail	4	1.3	6	1.8	7	2.1	8	2.3	4	1.2
Homeless	17	5.4	12	3.6	7	2.1	6	1.7	2	0.6
<b>Co-Morbidity</b>										
HIV	12	3.8	21	6.3	15	4.6	21	5.9	22	6.6
<b>Substance Use</b>										
Alcohol	25	7.9	33	9.9	29	8.8	34	9.6	28	8.4
IDU	2	1.6	8	2.4	3	0.9	2	0.6	6	1.8
Non-IDU	5	1.6	4	1.2	9	2.7	12	3.4	9	2.7

**Table 16. Tuberculosis Cases by Selected Risk Factors: Central Region 2002-2006**

Total Cases	2002		2003		2004		2005		2006	
	45		65		51		52		40	
	No.	%	No.	%	No.	%	No.	%	No.	%
<b>Occupation</b>										
Health Care	1	2.2	3	4.6	0	0.0	0	0.0	1	2.5
Migrant	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Corrections	1	2.2	0	0.0	0	0.0	0	0.0	0	0.0
<b>Type of Residence</b>										
Long Term Care	4	8.9	4	6.2	2	3.9	3	5.8	1	2.5
Prison/Jail	3	6.7	1	1.5	0	0.0	2	3.8	0	0.0
Homeless	3	6.7	6	9.2	1	2.0	1	1.9	2	5.0
<b>Co-Morbidity</b>										
HIV	2	4.4	4	6.2	4	7.8	5	9.6	6	15.0
<b>Substance Use</b>										
Alcohol	4	8.9	12	18.5	7	13.7	7	13.5	8	20.0
IDU	1	2.2	3	4.6	1	2.0	0	0.0	6	15.0
Non-IDU	4	8.9	2	3.1	1	2.0	4	7.7	1	2.5

**Table 17. Tuberculosis Cases by Selected Risk Factors: Eastern Region, 2002-2006**

Total Cases	2002		2003		2004		2005		2006	
	53		59		64		82		56	
	No.	%	No.	%	No.	%	No.	%	No.	%
<b>Occupation</b>										
Health Care	1	1.9	1	1.7	2	3.1	1	1.2	0	0.0
Migrant	3	5.7	2	3.4	3	4.7	4	4.9	1	1.8
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	3.8	3	5.1	1	1.6	1	1.2	2	3.6
Prison/Jail	0	0.0	1	1.7	1	1.6	2	2.4	0	0.0
Homeless	3	5.7	3	5.1	2	3.1	3	3.7	0	0.0
<b>Co-Morbidity</b>										
HIV	3	5.7	3	5.1	5	7.8	6	7.3	4	7.1
<b>Substance Use</b>										
Alcohol	8	15.1	7	11.9	2	3.1	14	17.1	3	5.4
IDU	0	0.0	3	5.1	0	0.0	1	1.2	0	0.0
Non-IDU	1	1.9	0	0.0	1	1.6	5	6.1	3	5.4

**Table 18. Tuberculosis Cases by Selected Risk Factors: Northern Region 2002-2006**

Total Cases	2002		2003		2004		2005		2006	
	177		157		168		183		198	
	No.	%								
<b>Occupation</b>										
Health Care	7	4.0	2	1.3	3	1.8	5	2.7	5	2.5
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	10	5.6	15	9.6	8	4.8	7	3.8	3	1.5
Prison/Jail	1	0.6	3	1.9	1	0.6	2	1.1	1	0.5
Homeless	8	4.5	3	1.9	4	2.4	1	0.5	0	0.0
<b>Co-Morbidity</b>										
HIV	6	3.4	12	7.6	5	3.0	9	4.9	10	5.1
<b>Substance Use</b>										
Alcohol	5	2.8	5	3.2	7	4.2	5	2.7	5	2.5
IDU	1	0.6	2	1.3	2	1.2	0	0.0	0	0.0
Non-IDU	1	0.6	2	1.3	3	1.8	1	0.5	2	1.0

**Table 19. Tuberculosis Cases by Selected Risk Factors: Northwest Region, 2002-2006**

Total Cases	2002		2003		2004		2005		2006	
	15		29		24		19		28	
	No.	%	No.	%	No.	%	No.	%	No.	%
<b>Occupation</b>										
Health Care	0	0.0	1	3.4	3	12.5	1	5.3	0	0.0
Migrant	0	0.0	1	3.4	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	1	6.7	2	6.9	2	8.3	0	0.0	4	14.3
Prison/Jail	0	0.0	1	3.4	1	4.2	1	5.3	3	10.7
Homeless	1	6.7	0	0.0	0	0.0	1	5.3	0	0.0
<b>Co-Morbidity</b>										
HIV	2	13.3	1	3.4	0	0.0	0	0.0	2	7.1
<b>Substance Use</b>										
Alcohol	1	6.7	4	13.8	7	29.2	1	5.3	7	25.0
IDU	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Non-IDU	0	0.0	0	0.0	2	8.3	1	5.3	1	3.6

**Table 20. Tuberculosis Cases by Selected Risk Factors: Southwest Region 2002-2006**

Total Cases	2002		2003		2004		2005		2006	
	25		22		22		19		10	
	No.	%								
<b>Occupation</b>										
Health Care	1	4.0	1	4.5	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	0	0.0	3	13.6	2	10.5	3	30.0
Prison/Jail	0	0.0	0	0.0	2	9.1	1	5.3	0	0.0
Homeless	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
<b>Co-Morbidity</b>										
HIV	0	0.0	1	4.5	1	4.5	0	0.0	0	0.0
<b>Substance Use</b>										
Alcohol	5	20.0	5	22.7	6	27.3	6	31.6	4	40.0
IDU	0	0.0	0	0.0	0	0.0	1	5.3	0	0.0
Non-IDU	0	0.0	0	0.0	2	9.1	1	5.3	2	20.0

**Table 21. Culture Positive Tuberculosis Cases with Drug Resistance: Virginia, 2002-2006**

Initial Susceptibilities	2002		2003		2004*		2005		2006	
	<b>265</b>		<b>246</b>		<b>254</b>		<b>260</b>		<b>253</b>	
	No.	%	No.	%	No.	%	No.	%	No.	%
<b>Total Drug Resistance</b>	<b>32</b>	<b>12.1</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>
Any firstline drug	28	10.6	32	13.0	12	4.7	26	10.0	22	8.7
Multidrug**	4	1.5	2	0.8	1	0.4	3	1.2	5	2.0

\*Due to changes in definitions, streptomycin is no longer considered a firstline 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, 2002-2006\***

Total Cases	2002		2003		2004		2005		2006	
	<b>315</b>		<b>332</b>		<b>329</b>		<b>355</b>		<b>332</b>	
	No.	%	No.	%	No.	%	No.	%	No.	%
<b>Total Deaths</b>	<b>19</b>	<b>6</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>
Dead at Time Diagnosis	4	1.3	4	1.3	7	2.1	6	1.7	11	3.3
Died During Treatment	15	4.8	22	5.1	19	5.8	25	7.0	16	4.8

\*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]

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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.

#### 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.

#### 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.