

2011 Annual Tuberculosis Surveillance Report

Virginia Department of Health

Office of Epidemiology

**Division of Disease Prevention
Tuberculosis Control**

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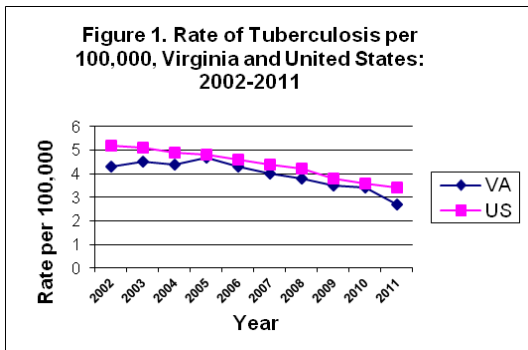
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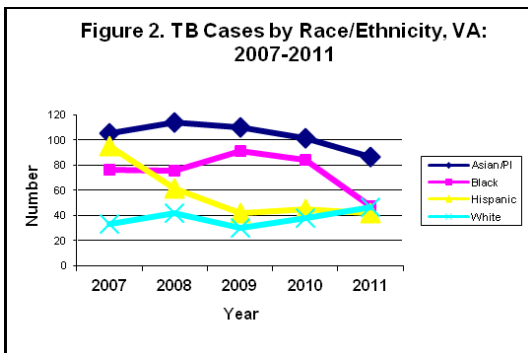
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In 2011, Virginia reported 221 tuberculosis (TB) cases, a substantial decrease from the 268 cases reported in 2010. For the second year in a row, TB cases reported nationally reached the lowest number and lowest rate since reporting began in 1954. Virginia ranks 12th in the nation for reported TB cases with a case rate of 2.7 per hundred thousand compared to 3.4 for the United States. In this report, data on demographics and selected risk factors are provided at the state and health region level for 2007-2011.



Sex and Race

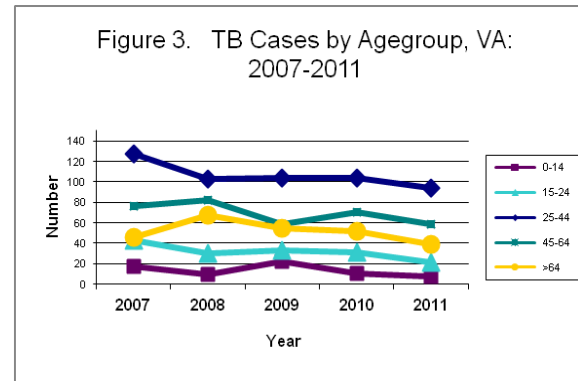
In 2011, 43.0% of TB cases were female and 57.0% were male. Among racial and ethnic groups, declines occurred among Asian Pacific Islanders, Blacks, and Hispanics when compared to 2010. An increase was observed among Whites in the same period (Figure 2).



Age

Eight pediatric cases, aged 0 to 14, were reported in 2011 as compared to 11 cases in 2010. Among the 15-24 year old age group,

21 cases were reported compared to 31 cases in 2010. The 25-44 year old age saw a decline with 94 cases compared to 104 in 2010. A decrease of 15.7% was observed among those aged 45-64 from 70 cases in 2010 to 59 in 2011. Those aged 65 and older decreased from 52 in 2010 to 39 in 2011 (Figure 3).



Place of Origin

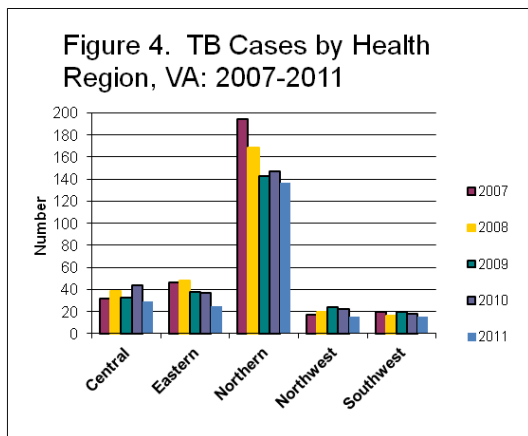
In 2011, 160 or 72.4% of Virginia’s TB cases were reported among foreign-born persons. Foreign-born cases declined again in 2011 by 7.5% compared to 2010, but the decline may be slowing. Nevertheless 2011 is a new low in the number of cases reported among foreign-born persons. The number of cases reported among US-born persons declined from 95 cases in 2010 to 61 cases in 2011.

The diversity of cultures and countries of origin among Virginia’s TB cases is remarkable. These cases represent 35 countries of origin and speak 17 languages other than English. The top five countries of origin include India, Ethiopia, the Philippines, Viet Nam, with China, Mexico and Nepal tied for the fifth rank.

Geographic Distribution

The decline in TB cases in 2011 is distributed evenly among the Health Regions. Northern Region reported 62% of the total cases and saw a slight decline from 147 cases in 2010 to 137 cases in 2011. Central Region reported 29 cases for 13.1% of the total and a substantial decrease from

the previous year that had excess cases due to an outbreak. Eastern Health Region reported 25 cases for 11.3% of the total and a decrease of 32.4%. Northwest and Southwest Health Regions reported small decreases (Figure 4).

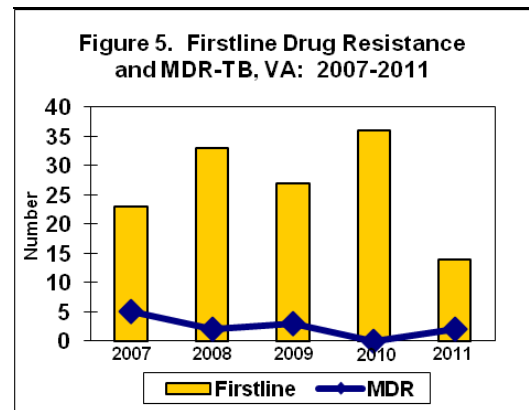


Selected Risk Factors

Several risk factors are associated with TB including occupational risk, congregate living, co-infection with HIV, homelessness, substance use and diabetes. In 2011, 7 health care workers were reported with TB. TB was reported in 5 residents of long-term care facilities, 9 incarcerated persons and 1 homeless person. Overall, 9 (4.1%) of Virginia's cases were reported with HIV infection as compared to 8 (3.0%) cases in 2010. In 2011, 17 cases (7.7%) reported excessive alcohol use and 13 cases (5.9%) reported drug use. Diabetes was the most frequent risk observed with 31 cases (14.0%) reported in 2011.

Drug Resistance

Drug susceptibility tests were performed for 174 culture positive case. Drug resistance was found in 12 cases to one or more first-line drugs, most frequently isoniazid. Two cases of multidrug resistant TB (MDR-TB) were reported in 2011. (By definition MDR-TB is resistant to both isoniazid and rifampin). No cases meeting the definition of extensively drug-resistant (XDR) TB were reported in 2011 (Figure 5).



Mortality

In 2011 11 (5.0%) TB cases died during treatment and four (1.8%) cases were diagnosed at the time of death or post-mortem. The mean age of those who died was 65 years with a range of 44 to 94.

Treatment Outcomes

For 2010, the year with the most complete data available, 89.8% of the drug-susceptible cases completed therapy within 12 months.

Contact Investigations

In 2010, 3177 contacts to acid-fast bacilli (AFB) sputum smear positive or sputum culture positive cases were identified. Of those, 89% were evaluated for infection and disease. Among the 311 people identified with latent TB infection (LTBI), 169 (54.3%) were started on treatment and 133 (78.7%) completed treatment for latent TB infection.

Table 1. Number and Rate of Tuberculosis Cases: Virginia and United States, 2001-2011

Year	Virginia		United States	
	No.	Rate	No.	Rate
2001	306	4.3	15,945	5.6
2002	315	4.3	15,056	5.2
2003	332	4.5	14,836	5.1
2004	329	4.4	14,500	4.9
2005	355	4.7	14,067	4.8
2006	332	4.3	13,727	4.6
2007	309	4.0	13,288	4.4
2008	292	3.8	12,904	4.2
2009	273	3.5	11,540	3.8
2010	268	3.4	11,181	3.6
2011	221	2.7	10,521	3.4

Historical US data from: CDC. Reported Tuberculosis in the United States, 2010. Atlanta, GA: US DHHS, CDC, October 2011.

2011 Data from Trends in Tuberculosis --- United States, 2012 MMWR March 23, 2011/61(11): 181-185.

Table 2. Tuberculosis Cases and Rate per 100,000 by Health Region: Virginia, 2007-2011

Region	2007			2008			2009			2010			2011		
	No.	%	Rate	No.	%	Rate	No.	%	Rate	No.	%	Rate	No.	%	Rate
Total	309	100	4.0	292	100	3.8	273	100	3.5	268	100	3.4	221	100	2.7
Central	32	10.4	2.4	39	13.4	2.9	33	12.1	2.5	44	16.4	3.3	28	12.7	2.0
Eastern	46	14.9	2.6	48	16.4	2.7	38	13.9	2.1	37	13.8	2.0	26	11.8	1.4
Northern	194	62.8	9.3	169	57.9	8.0	158	57.9	7.3	147	54.9	6.6	137	62.0	6.0
Northwest	17	5.5	1.4	20	6.8	1.7	24	8.8	2.0	22	8.2	1.8	15	6.8	1.2
Southwest	20	6.5	1.5	16	5.5	1.2	20	7.3	1.5	18	6.7	1.3	15	6.8	1.1

**Table 3. Tuberculosis Cases by Demographics and Location:
Virginia, 2007-2011**

Total Cases	2007		2008		2009		2010		2011	
	309		292		273		268		221	
	No	%	No	%	No	%	No	%	No	%
Sex										
Female	129	41.7	123	42.1	121	44.3	105	39.2	95	43.0
Male	180	58.3	169	57.9	152	55.7	163	60.8	126	57.0
Race/Ethnicity										
Asian/Pacific Islander	105	34.0	114	39.0	110	40.3	101	37.7	86	38.9
Black, Not Hispanic	76	24.6	75	25.7	91	33.3	84	31.3	47	21.3
Hispanic	95	30.7	61	20.9	42	15.4	45	16.8	42	19.0
White, Not Hispanic	33	10.7	42	14.4	30	11.0	38	14.2	46	20.8
Age										
0-14	17	5.5	10	3.4	22	8.1	11	4.1	8	3.6
15-24	43	13.9	30	10.3	33	12.1	31	11.6	21	9.5
25-44	127	41.1	103	35.3	104	38.1	104	38.8	94	42.5
45-64	76	24.6	82	28.1	59	21.6	70	26.1	59	26.7
>64	46	14.9	67	22.9	55	20.1	52	19.4	39	17.6
Place of Birth										
Foreign-born	230	74.4	212	72.6	190	69.6	173	64.6	160	72.4
US-born	79	25.6	80	27.4	83	30.4	95	35.4	61	27.6
Health Region										
Central	32	10.4	39	13.4	33	12.1	44	16.4	28	12.7
Eastern	46	14.9	48	16.4	38	13.9	37	13.8	26	11.8
Northern	194	62.8	169	57.9	158	57.9	147	54.9	137	62.0
Northwest	17	5.5	20	6.8	24	8.8	22	8.2	15	6.8
Southwest	20	6.5	16	5.5	20	7.3	18	6.7	15	6.8

Table 4. Tuberculosis Cases by Demographics and Region: Central, 2007-2011

	2007		2008		2009		2010		2011	
	32		39		33		44		28	
Total Cases	No.	%	No.	%	No.	%	No.	%	No.	%
Sex										
Female	12	37.5	13	33.3	13	39.4	17	38.6	12	42.9
Male	20	62.5	26	66.7	20	60.6	27	61.4	16	57.1
Race/Ethnicity										
Asian/Pacific Islander	1	3.1	10	25.6	4	12.1	6	13.6	9	32.1
Black, Not Hispanic	19	59.4	17	43.6	23	69.7	27	61.4	6	21.4
Hispanic	8	25.0	7	17.9	2	6.1	3	6.8	4	14.3
White, Not Hispanic	4	12.5	5	12.8	4	12.1	8	18.2	9	32.1
Age										
0-14	2	6.3	2	5.1	5	15.2	6	13.6	1	3.6
15-24	8	25.0	8	20.5	3	9.1	4	9.1	2	7.1
25-44	8	25.0	14	35.9	12	36.4	14	31.8	11	39.3
45-64	9	28.1	7	17.9	5	15.2	13	29.5	7	25.0
>64	5	15.6	8	20.5	8	24.2	7	15.9	7	25.0
Place of Birth										
Foreign-born	13	40.6	16	41.0	8	24.2	11	25.0	15	53.6
US Born	19	59.4	23	59.0	25	75.8	33	75.0	13	46.4

Table 5. Tuberculosis Cases by Demographics and Region: Eastern, 2007-2011

	2007		2008		2009		2010		2011	
	46		48		38		37		26	
Total Cases	No.	%	No.	%	No.	%	No.	%	No.	%
Sex										
Female	19	41.3	28	58.3	15	39.5	19	51.4	13	50.0
Male	27	58.7	20	41.7	23	60.5	18	48.6	13	50.0
Race/Ethnicity										
Asian/Pacific Islander	17	37.0	16	33.3	11	28.9	10	27.0	3	11.5
Black, Not Hispanic	19	41.3	16	33.3	17	44.7	13	35.1	14	53.8
Hispanic	4	8.7	5	10.4	4	10.5	3	8.1	0	0.0
White, Not Hispanic	6	13.0	11	22.9	6	15.8	11	29.7	9	34.6
Age										
0-14	1	2.2	2	4.2	5	13.2	1	2.7	4	15.4
15-24	1	2.2	4	8.3	1	2.6	5	13.5	3	11.5
25-44	13	28.3	11	22.9	10	26.3	10	27.0	6	23.1
45-64	21	45.7	13	27.1	11	28.9	10	27.0	6	23.1
>64	10	21.7	18	37.5	11	28.9	11	29.7	7	26.9
Place of Birth										
Foreign-born	20	43.5	24	50.0	14	36.8	15	40.5	6	23.1
US-born	26	56.5	24	50.0	24	63.2	22	59.5	20	76.9

Table 6. Tuberculosis Cases by Demographics and Region: Northern, 2007-2011

	2007		2008		2009		2010		2011	
	194		169		158		147		137	
Total Cases	No.	%	No.	%	No.	%	No.	%	No.	%
Sex										
Female	85	43.8	74	43.8	76	48.1	56	38.1	56	40.9
Male	109	56.2	95	56.2	82	51.9	91	61.9	81	59.1
Race/Ethnicity										
Asian/Pacific Islander	81	41.8	79	46.7	86	54.4	77	52.4	63	46.0
Black, Not Hispanic	29	14.9	35	20.7	36	22.8	32	21.8	24	17.5
Hispanic	77	39.7	40	23.7	27	17.1	31	21.1	36	26.3
White, Not Hispanic	7	3.6	15	8.9	9	5.7	7	4.8	14	10.2
Age										
0-14	12	6.2	4	2.4	7	4.4	4	2.7	3	2.2
15-24	30	15.5	15	8.9	20	12.7	20	13.6	14	10.2
25-44	94	48.5	65	38.5	69	43.7	65	44.2	65	47.4
45-64	38	19.6	51	30.2	35	22.2	38	25.9	39	28.5
>64	20	10.3	34	20.1	27	17.1	20	13.6	16	11.7
Place of Birth										
Foreign-born	179	92.3	153	90.5	143	90.5	130	88.4	123	96.9
US-born	15	7.7	16	9.5	15	9.5	17	11.6	4	3.1

Table 7. Tuberculosis Cases by Demographics and Region: Northwest, 2007-2011

	2007		2008		2009		2010		2011	
	17		20		24		22		15	
Total Cases	No.	%	No.	%	No.	%	No.	%	No.	%
Sex										
Female	8	47.1	5	25.0	6	25.0	5	22.7	8	53.3
Male	9	52.9	15	75.0	18	75.0	17	77.3	7	46.7
Race/Ethnicity										
Asian/Pacific Islander	4	23.5	5	25.0	6	25.0	4	18.2	8	53.3
Black, Not Hispanic	3	17.6	4	20.0	6	25.0	10	45.5	0	0.0
Hispanic	5	29.4	7	35.0	7	29.2	5	22.7	1	6.7
White, Not Hispanic	5	29.4	4	20.0	5	20.8	3	13.6	6	40.0
Age										
0-14	0	0.0	2	10.0	1	4.2	0	0.0	0	0.0
15-24	0	0.0	3	15.0	6	25.0	1	4.5	1	6.7
25-44	9	52.9	7	35.0	10	41.7	6	27.3	9	60.0
45-64	5	29.4	7	35.0	6	25.0	7	31.8	2	13.3
>64	3	17.6	1	5.0	1	4.2	8	36.4	3	20.0
Place of Birth										
Foreign-born	10	58.8	12	60.0	18	75.0	10	45.5	11	73.3
US-born	7	41.2	8	40.0	6	25.0	12	54.5	4	26.7

Table 8. Tuberculosis Cases by Demographics and Region: Southwest, 2007-2011

	2007		2008		2009		2010		2011	
	20		16		20		18		15	
Total Cases	No.	%	No.	%	No.	%	No.	%	No.	%
Sex										
Female	5	25.0	3	18.8	11	55.0	8	44.4	5	33.3
Male	15	75.0	13	81.3	9	45.0	10	55.6	10	66.7
Race/Ethnicity										
Asian/Pacific Islander	2	10.0	4	25.0	3	15.0	4	22.2	3	20.0
Black, Not Hispanic	6	30.0	3	18.8	9	45.0	2	11.1	3	20.0
Hispanic	2	10.0	2	12.5	3	15.0	3	16.7	0	0.0
White, Not Hispanic	10	50.0	7	43.8	5	25.0	9	50.0	9	60.0
Age										
0-14	2	10.0	0	0.0	4	20.0	0	0.0	0	0.0
15-24	4	20.0	0	0.0	3	15.0	1	5.6	1	6.7
25-44	3	15.0	7	43.8	3	15.0	9	50.0	3	20.0
45-64	3	15.0	3	18.8	2	10.0	2	11.1	5	33.3
>64	8	40.0	6	37.5	8	40.0	6	33.3	6	40.0
Place of Birth										
Foreign-born	8	40.0	7	43.8	7	35.0	7	38.9	5	33.3
US-born	12	60.0	9	56.3	13	65.0	11	61.1	10	66.7

Table 9. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Virginia, 2007-2011

Race/Ethnicity	2007		2008		2009		2010		2011	
	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born
Total	79	230	80	212	83	190	95	173	61	160
Asian/Pacific Islander	3	102	3	111	7	103	1	100	3	83
Black, Not Hispanic	45	31	37	38	48	43	52	32	25	22
Hispanic	5	90	3	58	3	40	7	38	2	40
White, Not Hispanic	26	7	37	5	25	4	35	3	31	15

Table 10. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Central Region, 2007-2011

Race/Ethnicity	2007		2008		2009		2010		2011	
	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born
Total	19	13	23	16	25	8	33	11	13	15
Asian/Pacific Islander	0	1	1	9	0	4	0	6	0	9
Black, Not Hispanic	14	5	17	0	21	2	26	1	6	0
Hispanic	1	7	0	7	0	2	0	3	0	4
White, Not Hispanic	4	0	5	0	4	0	7	1	7	2

Table 11. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Eastern Region, 2007-2011

Race/Ethnicity	2007		2008		2009		2010		2011	
	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born
Total	26	20	24	24	24	14	22	15	20	6
Asian/Pacific Islander	1	16	0	16	1	10	0	10	1	2
Black, Not Hispanic	19	0	13	3	16	1	13	0	13	1
Hispanic	1	3	1	4	1	3	0	3	0	0
White, Not Hispanic	5	1	10	1	6	0	9	2	6	3

Table 12. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Northern Region, 2007-2011

Race/Ethnicity	2007		2008		2009		2010		2011	
	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born
Total	15	179	16	153	15	143	17	130	14	123
Asian/Pacific Islander	2	79	2	77	5	81	1	76	2	61
Black, Not Hispanic	7	22	2	33	2	34	3	29	3	21
Hispanic	3	74	1	39	1	26	6	25	2	34
White, Not Hispanic	3	4	11	4	7	2	7	0	7	7

Table 13. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Northwest Region, 2007-2011

Race/Ethnicity	2007		2008		2009		2010		2011	
	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born
Total	7	10	8	12	6	18	12	10	4	11
Asian/Pacific Islander	0	4	0	5	0	6	0	4	0	8
Black, Not Hispanic	2	1	3	1	3	3	8	2	0	0
Hispanic	0	4	1	6	0	7	1	4	0	1
White, Not Hispanic	5	1	4	0	3	2	3	0	4	2
Other	0	0	0	0	0	0	0	0	0	0

Table 14. Tuberculosis Cases by Race/Ethnicity and Place of Birth: Southwest Region, 2007-2011

Race/Ethnicity	2007		2008		2009		2010		2011	
	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born	US-born	Foreign-born
Total	12	8	9	7	13	7	11	7	10	5
Asian/Pacific Islander	0	2	0	4	1	2	0	4	0	3
Black, Not Hispanic	0	3	2	1	6	3	2	0	3	0
Hispanic	3	2	0	2	1	2	0	3	0	0
White, Not Hispanic	9	1	7	0	5	0	9	0	7	2

Table 15. Tuberculosis Cases by Selected Risk Factors: Virginia, 2007-2011

Total Cases	2007		2008		2009		2010		2011	
	309		292		273		268		221	
	No.	%	No.	%	No.	%	No.	%	No.	%
Occupation										
Health Care	5	1.6	6	2.1	11	4.0	12	4.5	7	3.2
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	0.6	5	1.7	3	1.1	8	3.0	5	2.3
Prison/Jail	6	1.9	5	1.7	4	1.5	8	3.0	8	3.6
Homeless	8	2.6	4	1.4	9	3.3	12	4.5	1	0.5
Co-Morbidity										
Diabetes	29	9.4	40	13.7	37	13.6	37	13.8	31	14.0
HIV	10	3.2	9	3.1	18	6.6	8	3.0	9	4.1
Substance Use										
Alcohol	25	8.1	19	6.5	21	7.7	23	8.6	17	7.7
IDU	5	1.6	0	0.0	6	2.2	1	0.4	0	0.0
Non-IDU	8	2.6	6	2.1	6	2.2	4	1.5	13	5.9

Table 16. Tuberculosis Cases by Selected Risk Factors: Central Region, 2007-2011

Total Cases	2007		2008		2009		2010		2011	
	32		39		39		44		28	
	No.	%	No.	%	No.	%	No.	%	No.	%
Occupation										
Health Care	0	0.0	0	0.0	1	2.6	2	4.5	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
Type of Residence										
Long Term Care	0	0.0	1	2.6	0	0.0	2	4.5	0	0.0
Prison/Jail	2	6.3	1	2.6	1	2.6	4	9.1	2	7.1
Homeless	1	3.1	0	0.0	2	5.1	2	4.5	0	0.0
Co-Morbidity										
Diabetes	1	3.1	3	7.7	6	15.4	7	15.9	2	7.1
HIV	0	0.0	1	2.6	1	2.6	1	2.3	3	10.7
Substance Use										
Alcohol	4	12.5	3	7.7	7	17.9	8	18.2	5	17.9
IDU	0	0.0	0	0.0	2	5.1	0	0.0	0	0.0
Non-IDU	3	9.4	2	5.1	1	2.6	0	0.0	3	10.7

Table 17. Tuberculosis Cases by Selected Risk Factors: Eastern Region, 2007-2011

Total Cases	2007		2008		2009		2010		2011	
	46		48		38		37		26	
	No.	%	No.	%	No.	%	No.	%	No.	%
Occupation										
Health Care	1	2.2	0	0.0	0	0.0	3	8.1	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	1	2.2	0	0.0	0	0.0	1	2.7	0	0.0
Prison/Jail	0	0.0	1	2.1	0	0.0	0	0.0	0	0.0
Homeless	2	4.3	0	0.0	1	2.6	4	10.8	0	0.0
Co-Morbidity										
Diabetes	4	8.7	9	18.8	7	18.4	6	16.2	3	11.5
HIV	3	6.5	1	2.1	2	5.3	1	2.7	1	3.8
Substance Use										
Alcohol	4	8.7	6	12.5	3	7.9	5	13.5	1	3.8
IDU	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Non-IDU	4	8.7	2	4.2	1	2.6	2	5.4	2	7.7

Table 18. Tuberculosis Cases by Selected Risk Factors: Northern Region, 2007-2011

Total Cases	2007		2008		2009		2010		2011	
	194		169		158		147		137	
	No.	%	No.	%	No.	%	No.	%	No.	%
Occupation										
Health Care	3	1.5	5	3.0	8	5.1	4	2.7	6	4.4
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	0	0.0	4	2.4	3	1.9	6	4.1	3	2.2
Prison/Jail	1	0.5	2	1.2	0	0.0	4	2.7	3	2.2
Homeless	5	2.6	3	1.8	4	2.5	5	3.4	1	0.7
Co-Morbidity										
Diabetes	20	10.3	25	14.8	21	13.3	18	12.2	24	17.5
HIV	4	2.1	4	2.4	7	4.4	4	2.7	3	2.2
Substance Use										
Alcohol	8	4.1	7	4.1	7	4.4	6	4.1	9	6.6
IDU	1	0.5	0	0.0	1	0.6	0	0.0	0	0.0
Non-IDU	2	1.0	1	0.6	1	0.6	1	0.7	6	4.4

Table 19. Tuberculosis Cases by Selected Risk Factors: Northwest Region, 2007-2011

Total Cases	2007		2008		2009		2010		2011	
	17		20		24		22		15	
	No.	%	No.	%	No.	%	No.	%	No.	%
Occupation										
Health Care	1	5.9	1	5.0	2	8.3	3	13.6	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	0	0.0	0	0.0	0	0.0	0	0.0	2	13.3
Prison/Jail	1	5.9	1	5.0	4	16.7	0	0.0	1	6.7
Homeless	0	0.0	0	0.0	2	8.3	0	0.0	0	0.0
Co-Morbidity										
Diabetes	1	5.9	1	5.0	0	0.0	4	0.0	0	0.0
HIV	2	11.8	2	10.0	5	20.8	1	4.5	0	0.0
Substance Use										
Alcohol	3	17.6	2	10.0	3	12.5	3	13.6	1	6.7
IDU	2	0.0	0	0.0	2	0.0	0	0.0	0	0.0
Non-IDU	1	5.9	1	5.0	1	4.2	0	0.0	1	6.7

Table 20. Tuberculosis Cases by Selected Risk Factors: Southwest Region, 2007-2011

Total Cases	2007		2008		2009		2010		2011	
	20		16		20		18		15	
	No.	%	No.	%	No.	%	No.	%	No.	%
Occupation										
Health Care	0	0.0	0	0.0	0	0.0	0	0.0	1	6.7
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	1	5.0	0	0.0	0	0.0	1	5.6	0	0.0
Prison/Jail	2	10.0	0	0.0	0	0.0	0	0.0	2	13.3
Homeless	0	0.0	1	0.0	0	0.0	1	0.0	0	0.0
Co-Morbidity										
Diabetes	3	15.0	2	12.5	3	15.0	2	11.1	1	6.7
HIV	1	5.0	1	6.3	3	15.0	1	5.6	2	13.3
Substance Use										
Alcohol	5	25.0	1	6.3	1	5.0	1	5.6	1	6.7
IDU	2	11.8	0	0.0	1	4.2	1	4.5	0	0.0
Non-IDU	0	0.0	0	0.0	2	10.0	2	11.1	1	6.7

Table 21. Culture Positive Tuberculosis Cases with Drug Resistance: Virginia, 2007-2011

Initial Susceptibilities	2007		2008		2009		2010		2011	
	219		219		204		215		174	
	No.	%	No.	%	No.	%	No.	%	No.	%
Total Drug Resistance	28	12.8	35	16.0	30	14.7	36	16.7	14	8.0
Any firstline drug	23	10.5	33	15.1	27	13.2	36	16.7	12	6.9
Multidrug**	5	2.3	2	0.9	3	1.5	0	0.0	2	1.1

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

Table 6. Tuberculosis Mortality: Virginia, 2007-2011*

Total Cases	2007		2008		2009		2010		2011	
	309		292		273		268		221	
	No.	%	No.	%	No.	%	No.	%	No.	%
Total Deaths	11	3.6	20	6.8	13	4.8	16	6.0	15	6.8
Dead at Time Diagnosis	5	1.6	3	1.0	2	0.7	7	2.6	4	1.8
Died During Treatment	6	1.9	17	5.8	11	4.0	8	3.0	11	5.0

*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 Tables 1 and 2, rates for 2001-2010 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, 2010 (CO-EST2006-01-51). For 2011, rates were calculated using 2010 Census data release by the United States Bureau of the Census.

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.

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.

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

**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.