

2007 Tuberculosis Statistics for North Carolina



State of North Carolina | Department of Health and Human Services
Division of Public Health | Communicable Disease Branch
Tuberculosis Control Program

April 2008

2007 Tuberculosis Statistics for North Carolina

State of North Carolina
Department of Health and Human Services
Division of Public Health
Communicable Disease Branch
Tuberculosis Control Program

April 2008

State of North Carolina • Michael F. Easley, Governor
Department of Health and Human Services • Dempsey Benton, Secretary
Division of Public Health • Leah Devlin, State Health Director
www.ncdhhs.gov
www.epi.state.nc.us/epi/tb/
N.C. DHHS is an equal opportunity employer and provider. 5/08

Table of Contents

HIGHLIGHTS	iii
DEMOGRAPHICS	1
RISK FACTORS	9
CLINICAL DATA	18
SUPPLEMENTAL TABLES	23

LIST OF TABLES

TABLE 1: N.C. AND U.S. CASE RATE AND N.C. RANKING IN U.S. BY CASE RATE 2003-2007	3
TABLE 2: N.C. TB CASE RATES FOR 2003-2007	6
TABLE 3: PEDIATRIC CASES BY FOREIGN-BORN STATUS	11
TABLE 4: ALCOHOL USE BY RACE AND ETHNICITY 2003-2007.....	12
TABLE 5: TB CASES WITH HIV INFECTION BY AGE GROUP 2003 - 2007	16
TABLE 6: REPORTED HIV RESULTS 2003 – 2007.....	16
TABLE 7. MAJOR SITE OF DISEASE FOR N.C. TB PATIENTS: 2003 - 2007.....	21
TABLE 8. FIRST-LINE PRIMARY TB DRUG RESISTANCE IN N.C. PATIENTS: 2003-2007.....	21
TABLE 9: TB CASES AND CASE RATES BY COUNTY 2003-2007.....	24
TABLE 10: FOREIGN-BORN TB CASES BY COUNTY 2003-2007.....	27
TABLE 11: FOREIGN-BORN CASES BY COUNTRY OF ORIGIN 2003-2007.....	30
TABLE 12: HISPANIC TB CASES BY COUNTY 2003-2007.....	32

LIST OF FIGURES

FIGURE 1. REPORTED TB CASES IN N.C.: 1980 - 2007.....	2
FIGURE 2. TB CASE RATES FOR N.C. AND THE U.S.: 1980 - 2007	3
FIGURE 3. NORTH CAROLINA 2007 TUBERCULOSIS CASES.....	5
FIGURE 4. N.C. TB CASES BY GENDER: 2003 – 2007.....	7
FIGURE 5. N.C. TB CASES BY AGE GROUP: 2003 – 2007	7
FIGURE 6. N.C. TB CASES BY RACE: 2003 – 2007.....	8
FIGURE 7. N.C. TB CASES BY ETHNICITY: 2003 – 2007.....	8
FIGURE 8. N.C. TB CASES BY NUMBER OF RISK FACTORS: 2003 – 2007.....	10
FIGURE 9. N.C. FOREIGN-BORN TB CASES: 2003 – 2007.....	10
FIGURE 10. COUNTRIES OF BIRTH FOR 2007 FOREIGN-BORN TB CASES IN N.C.....	11
FIGURE 11. N.C. TB CASES WITH EXCESS ALCOHOL USE: 2003 - 2007	12
FIGURE 12. N.C. TB CASES WITH KNOWN NON-INJECTING DRUG USE: 2003 – 2007	13
FIGURE 13. N.C. TB CASES WITH KNOWN INJECTING DRUG USE: 2003 – 2007.....	13
FIGURE 14. N.C. TB CASES HOMELESS IN YEAR PRIOR TO DIAGNOSIS: 2003 - 2007	14
FIGURE 15. N.C. TB CASES THAT WERE RESIDENTS OF A LONG-TERM CARE FACILITY AT TIME OF DIAGNOSIS: 2003 – 2007.....	14
FIGURE 16. N.C. TB CASES RESIDING IN CORRECTIONAL FACILITY AT TIME OF DIAGNOSIS: 2003 – 2007.....	15
FIGURE 17. N.C. TB CASES WITH HIV INFECTION: 2003 – 2007.....	15
FIGURE 18: N.C. TB CASES WITH UNKNOWN HIV STATUS: 1997 - 2007	17
FIGURE 19. N.C. HEALTH CARE WORKERS WITH TB DISEASE: 2003 - 2007	17
FIGURE 20. N.C. TB CASE MORTALITY AND RATES: 2002 – 2006.....	19
FIGURE 21. TIMING OF DEATH AMONG TB CASES IN N.C.: 2002 – 2006.....	19
FIGURE 22. PREVIOUS DIAGNOSIS OF TB FOR TB PATIENTS IN N.C.: 2003 - 2007.....	20
FIGURE 23. MAJOR SITE OF DISEASE FOR TB PATIENTS IN N.C.: 2003 - 2007.....	20
FIGURE 24. PATIENTS COMPLETING THERAPY IN N.C.: 2002 - 2006.....	22

HIGHLIGHTS

Demographics:

- North Carolina was ranked as the nation's 22nd highest state for case rates in 2007. This can be viewed as significant progress — in 1980, North Carolina was ranked as the 3rd highest state for case rates.
- The state's number of TB cases in 2007 was 345. Since 1980, TB cases in North Carolina have decreased by approximately four percent per year. As a result, the number of cases in 2007 was approximately 32 percent the number of cases in 1980.
- In 2007, 140 of the 345 cases were located in six counties: Wake (54), Mecklenburg (34), Robeson (17), Buncombe (13), Pitt (11), and Forsyth (11). Of these six counties, only Forsyth's rate was below the state rate. There were 38 counties with no TB cases in 2007.
- The number of Asians with TB increased by 83 percent between 2003 and 2007. The rate for Asians increased from 22.2 to 31.6 per 100,000 population.
- The number of African-Americans with TB decreased by 29 percent from 2003 to 2007. The rate for African-Americans decreased from 10.7 to 6.7 per 100,000 population.
- The number of Hispanics with TB increased by 46 percent from 2003 to 2007. However, the rate remained fairly stable, increasing from 15.1 to 16.6 per 100,000 population. Of the 408 total Hispanic cases from 2003 to 2007, 160 were located in four counties: Wake (58), Mecklenburg (55), Forsyth (24), and Durham (23).
- The age distribution is changing. From 2003 to 2007, the number of people with TB ages 0 to 24 increased by 52 percent and the number of people with TB ages 25 and over decreased by 16 percent. The numbers and rates for specific age groups can be found on page 5.

Risk Factors:

- Most people with TB have at least one of these risk factors: being born in a country with a higher TB incidence than the U.S. ("foreign born"), homeless within past year, resident of a long-term care or correctional facility, HIV co-infected, excessive alcohol user, or non-injecting or injecting drug user.
- The percent of cases that are foreign-born increased from 30 percent in 2003 to 41 percent in 2007. Half of all foreign born cases of TB in 2007 came from three countries: (1) Mexico (38%), (2) India (11%), and (3) Vietnam (6%). For the five-year period from 2003 to 2007, a total of 627 cases were foreign-born. Among those, 402 cases came from five countries: Mexico (244), Vietnam (52), India (51), Honduras (31), and the Philippines (24). Of the total, 269 cases were located in five counties: Wake (132), Mecklenburg (110), Guilford (68), Durham (36), and Forsyth (33).
- TB cases with reported excessive alcohol use decreased from 21 percent in 2003 to 12 percent in 2007. Most of the persons with excessive alcohol use were non-Hispanic, and it was the non-Hispanic group that accounted for the overall decrease.
- Homeless cases with TB decreased from 10 percent in 2003 to 4 percent in 2007.

- HIV reporting for TB cases increased significantly from 1997 to 2007. In 1997, there were 174 persons for whom HIV testing was not offered, not known, or refused by the patient. In 2007, there were 25 persons for whom HIV testing was not offered, not known, or refused by the patient.

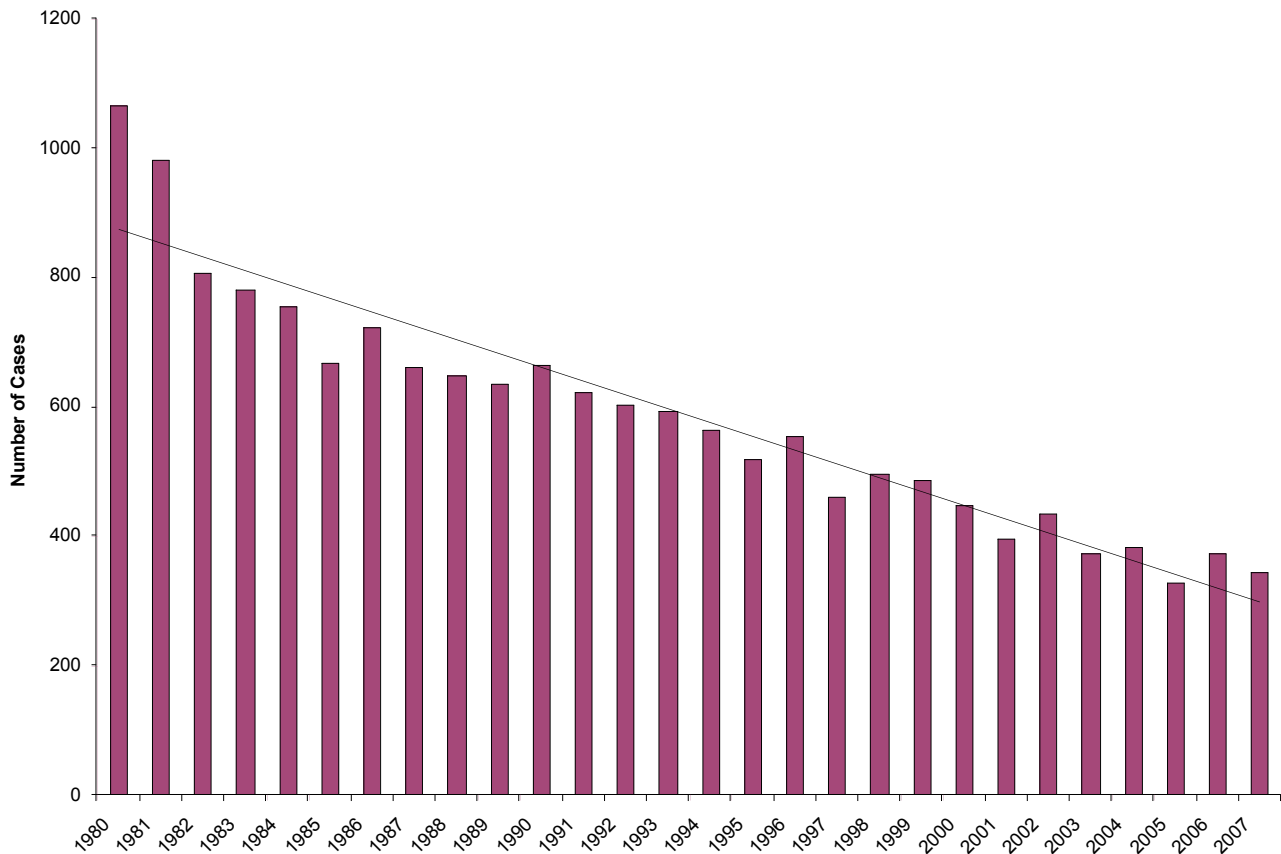
Clinical data:

- Mortality of tuberculosis cases greatly decreased from 2002 to 2006. The number of TB deaths in 2002 was 59; by 2006 there were 21 TB deaths. Of those who died, the number who were dead at diagnosis was 15 in 2002 and 7 in 2006. However, more significantly, the number who died during treatment was 44 in 2002 and 14 by 2006.
- TB cases who were *previously diagnosed with tuberculosis decreased from 24 in 2003 to 13 in 2007. * A patient is considered to have had a previous diagnosis of TB if they had verified TB disease in the past, had been discharged (incomplete therapy) or lost to supervision for more than 12 consecutive months, and has verified TB disease again.
- The major site of disease for TB cases in 2007 was predominately pulmonary (271), followed by pleural (19), and miliary (17).
- Drug resistance changed only slightly from 2003 to 2007. Isoniazid (INH) resistance without resistance to streptomycin (SM) or rifampin (RIF) decreased from 13 cases (4%) to 6 cases (2%). INH and SM resistance without RIF resistance decreased from 6 cases (2%) to 3 cases (1%). However, MDR (INH and RIF resistance) increased from 0 to 2 cases (1%). Any other resistance increased from 11 (4%) to 15 (5%). Total drug resistant cases in 2003 were 30 (10%) and in 2007 were 25 (9%).

DEMOGRAPHICS

DEMOGRAPHIC CHARACTERISTICS

Figure 1. Reported TB Cases in N.C.: 1980 - 2007

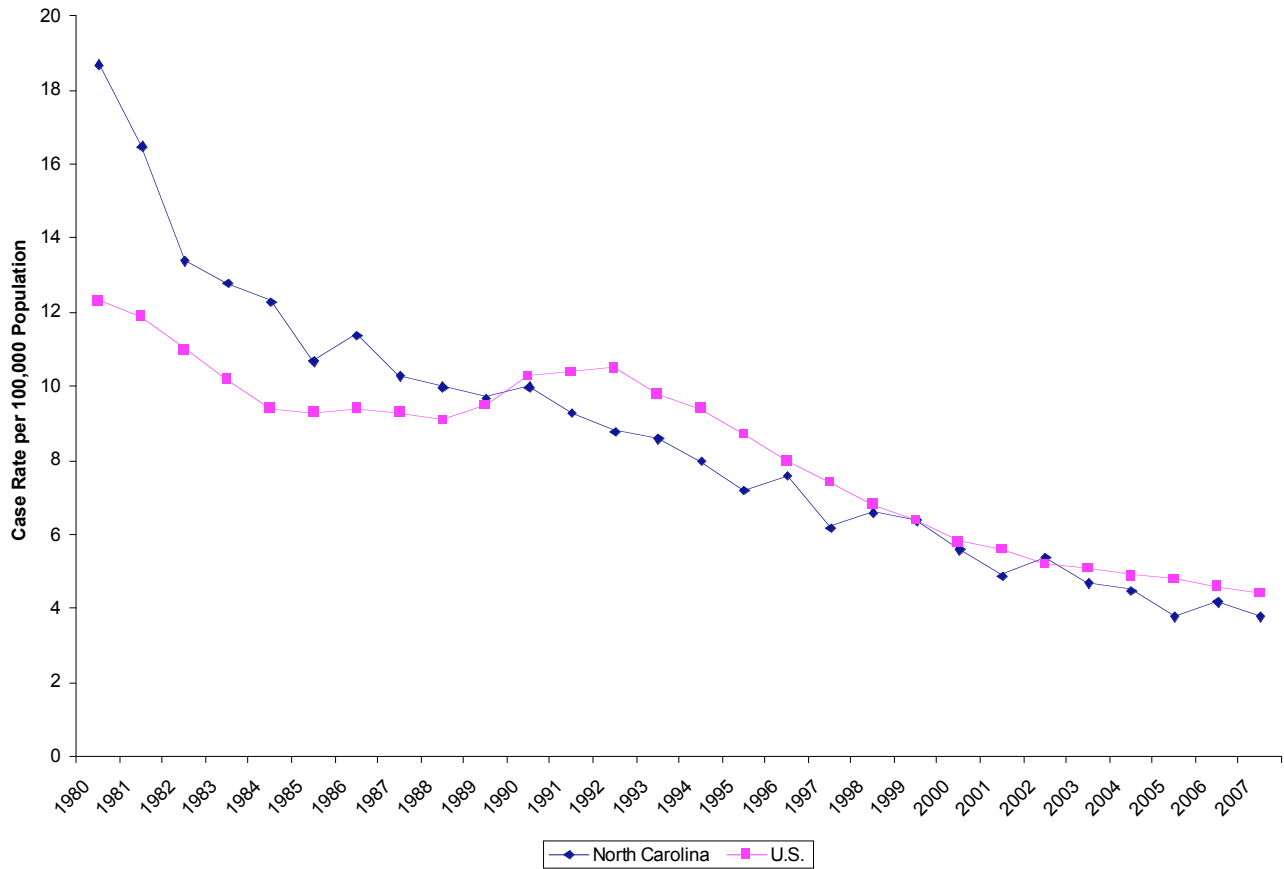


DATA SOURCE: CaroTIMS.

As can be seen from Figure 1, the number of cases in North Carolina for 2007 is approximately 32 percent the number of cases in 1980. The numbers have declined, on average, about 4 percent per year. TB incidence in North Carolina decreased 8 percent between 2003 and 2007, down from 374 cases to 345 cases. The number of cases reported in North Carolina decreased from 374 to 345 between reporting years 2006 and 2007, an 8 percent decrease in overall cases.

Both U.S. and N.C. TB case rates have dropped significantly since 1980. (See Figure 2.) Although the number of cases has declined in North Carolina over the past five years, the state was ranked as 22nd highest for case rates in 2007. (See Table 1.)

Figure 2. TB Case Rates for N.C. and the U.S.: 1980 - 2007



DATA SOURCE: Annual surveillance reports published by CDC.

Table 1: N.C. and U.S. Case Rate and N.C. Ranking in U.S. by Case Rate 2003-2007

Year	Case Rate and Rank by Case Rate 2003-2007		
	Rates		Rank
	USA	North Carolina	
2003	5.1	4.4	21
2004	4.9	4.5	19
2005	4.8	3.8	25
2006	4.6	4.2	18
2007	4.4	3.8	22

DATA SOURCE: Annual surveillance reports published by CDC.

Figure 3 on the following page is a map of 2007 cases in N.C. by county of residence.

North Carolina 2007 Tuberculosis Cases

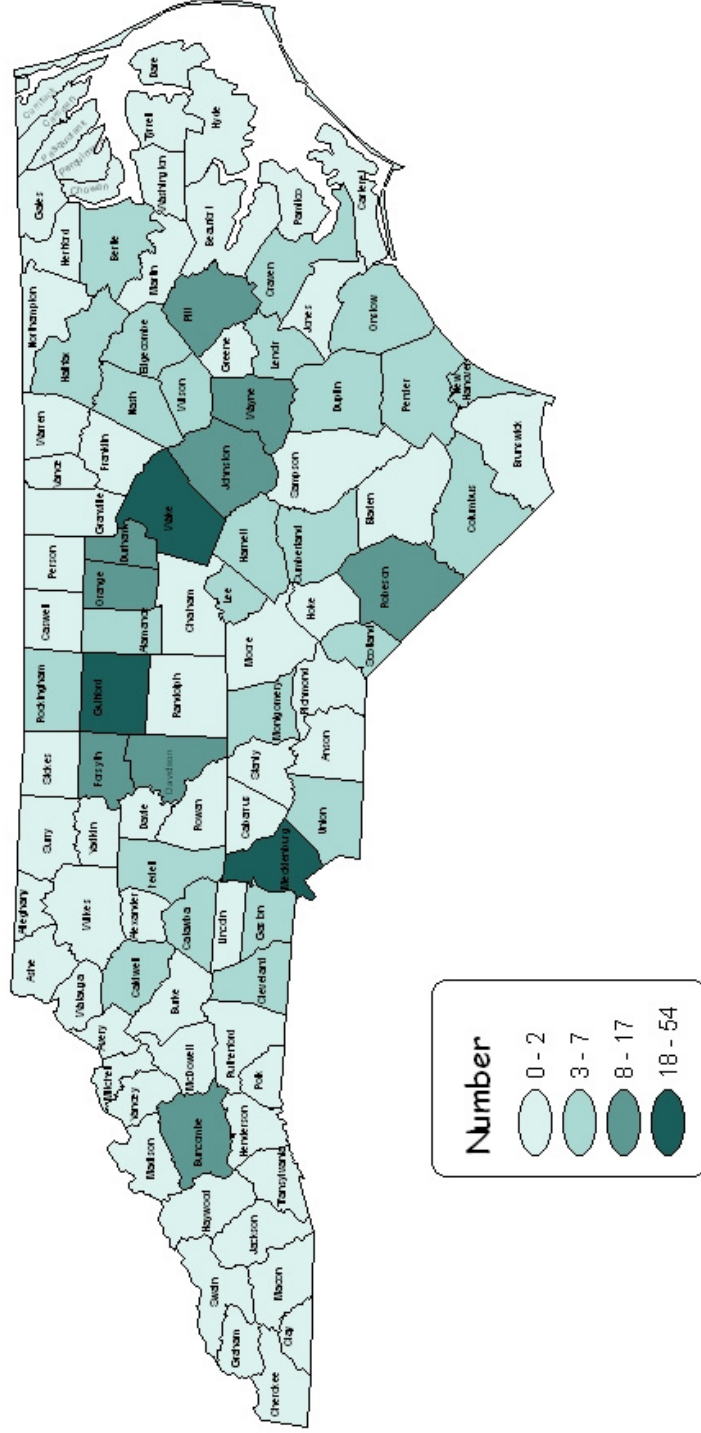


Table 2 provides a demographic overview of reported cases and case rates in N.C. from 2003 to 2007. Table 9 (page 23) provides TB incidence and rates by county. Figures 4, 5, 6 and 7 provide information about percent of cases by gender, age, race and ethnicity. The number of cases for Asians increased almost 83 percent between 2003 and 2007, while the number of black/African-American cases decreased by approximately 29 percent. The number of cases ages 0-24 increased by 52 percent, while the number of cases who were 25 and over decreased by 16 percent.

Table 2: N.C. TB Case Rates for 2003-2007

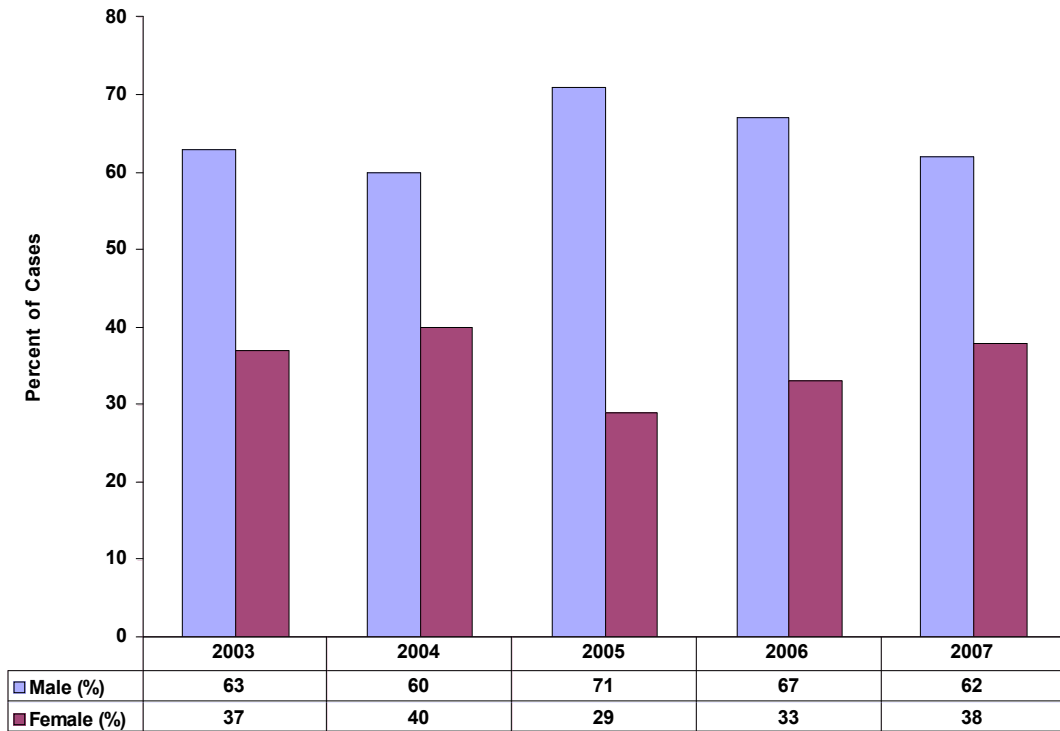
Table 2		NORTH CAROLINA TB CASE RATES FOR 2003-2007*†									
Year		2003		2004		2005		2006		2007	
VARIABLES		#	Rate	#	Rate	#	Rate	#	Rate	#	Rate
Cases		374	4.4	382	4.5	329	3.8	374	4.2	345	3.8
SEX											
Male		234	5.9	231	5.7	233	5.7	252	6.1	214	4.8
Female		140	3.3	151	3.6	96	2.2	122	2.8	131	2.8
RACE											
White‡		151	2.6	167	2.8	132	2.2	141	2.3	153	2.3
Black/African-American		185	10.7	168	9.6	159	9.0	166	9.4	131	6.7
Asian		29	22.2	42	30.1	28	19.1	57	38.8	53	31.6
Amer. Indian/Alaska Native		7	8.1	5	5.8	9	8.4	8	7.5	7	6.2
Hawaiian/Other Pac. Isl.		1	14.4	0	0	1	29.9	0	0	0	0.0
Multi-Racial		1	0.8	0	0	0	0	2	1.6	1	1.1
ETHNICITY											
Hispanic		69	15.1	91	18.0	72	13.5	75	14.1	101	16.6
Non-Hispanic		305	4.0	291	3.7	257	3.3	299	3.8	244	2.9
AGE											
0- 4		12	2.0	25	4.2	13	2.2	10	1.7	18	2.9
5-14		5	0.4	6	0.5	7	0.6	7	0.6	7	0.6
15-24		29	2.8	42	4.1	28	2.6	52	4.9	45	3.7
25-44		128	5.2	125	5.0	105	4.2	132	5.3	122	4.7
45-64		120	6.1	96	4.8	106	5.1	100	4.8	89	3.9
>65		80	8.4	88	9.1	70	7.1	73	7.4	64	5.8

*Data source: TIMS. Rates are per 100,000.

‡Includes white Hispanic and white non-Hispanic.

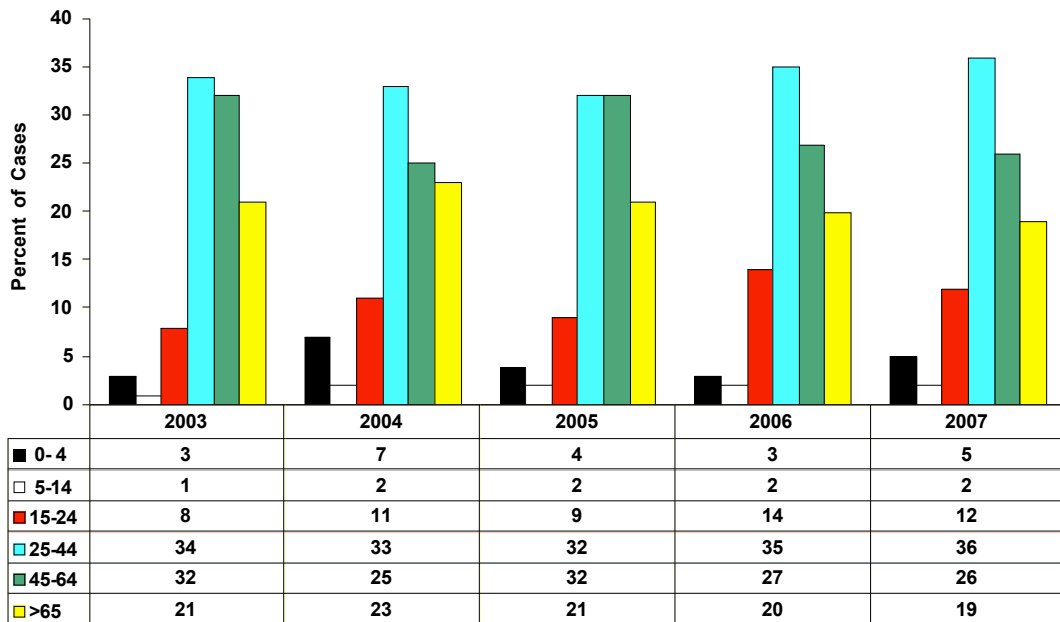
†Denominators for computing rates for the state were obtained from the Annual Estimates of the Population for the United States and Puerto Rico. 2007 rates were calculated based on the 2006 population estimates with the strata inflated to reflect the 2.3% increase of the total N.C. population from 2006 to 2007.

Figure 4. N.C. TB Cases by Gender: 2003 – 2007



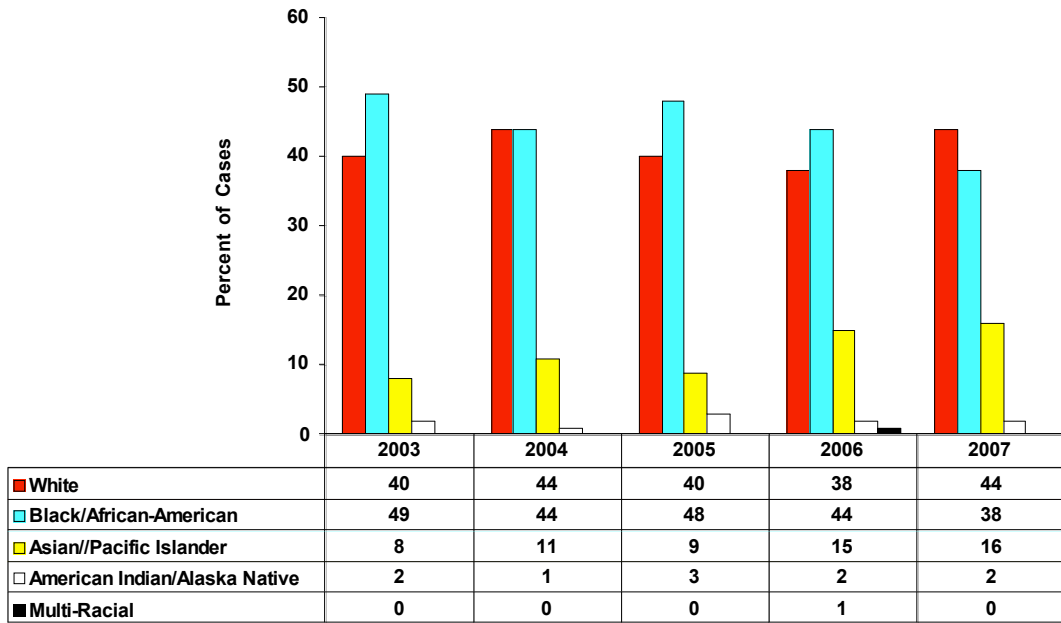
DATA SOURCE: CaroTIMS.

Figure 5. N.C. TB Cases by Age Group: 2003 – 2007



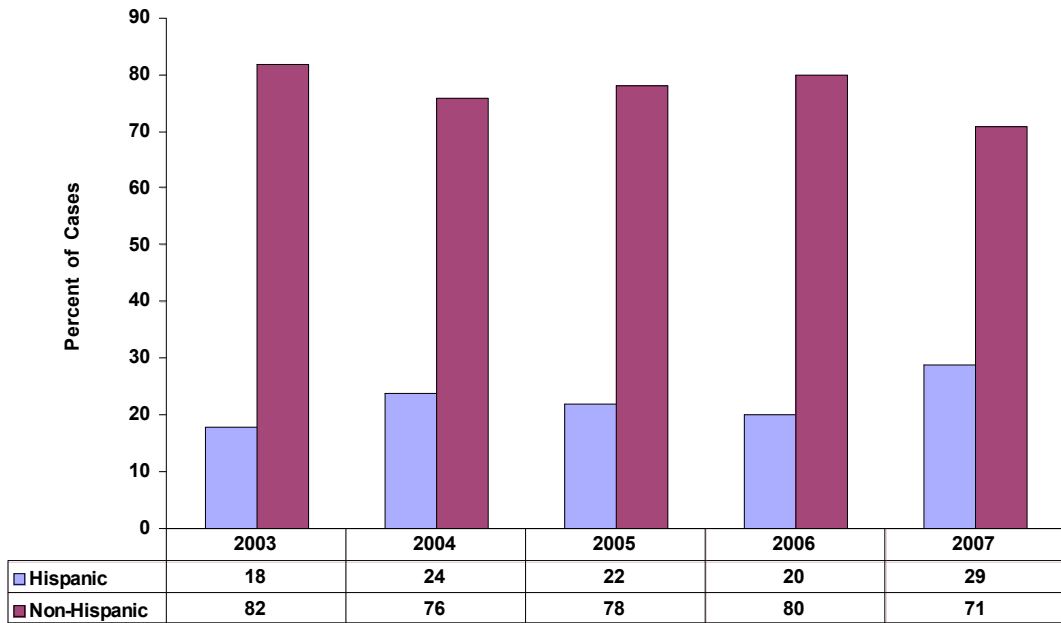
DATA SOURCE: CaroTIMS.

Figure 6. N.C. TB Cases by Race: 2003 – 2007



DATA SOURCE: CaroTIMS.

Figure 7. N.C. TB Cases by Ethnicity: 2003 – 2007



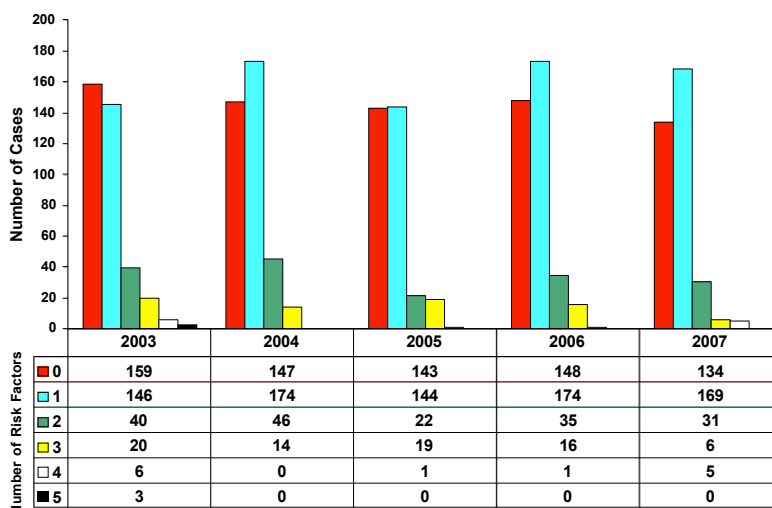
DATA SOURCE: CaroTIMS.

RISK FACTORS

RISK FACTORS FOR TB IN 2007 CASES

There are several risk factors commonly associated with increased incidence of TB. These include: being foreign-born; excess alcohol use; non-injecting and/or injecting drug use; being homeless; being a resident of a long-term care facility or a correctional facility; being co-infected with HIV; and being a health-care worker. This section of this report describes our TB cases for these factors. As can be seen from Figure 8, most people with TB have at least one risk factor, and approximately 12 percent of the cases have two or more risk factors.

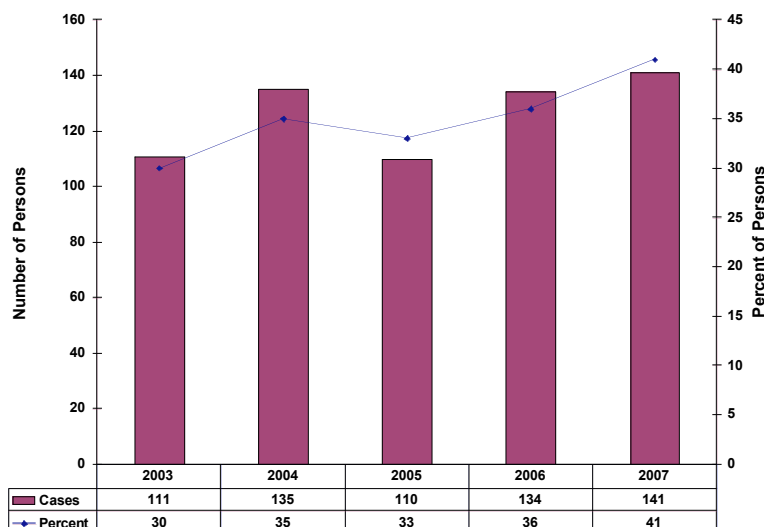
Figure 8. N.C. TB Cases by Number of Risk Factors: 2003 – 2007



DATA SOURCE: CaroTIMS.

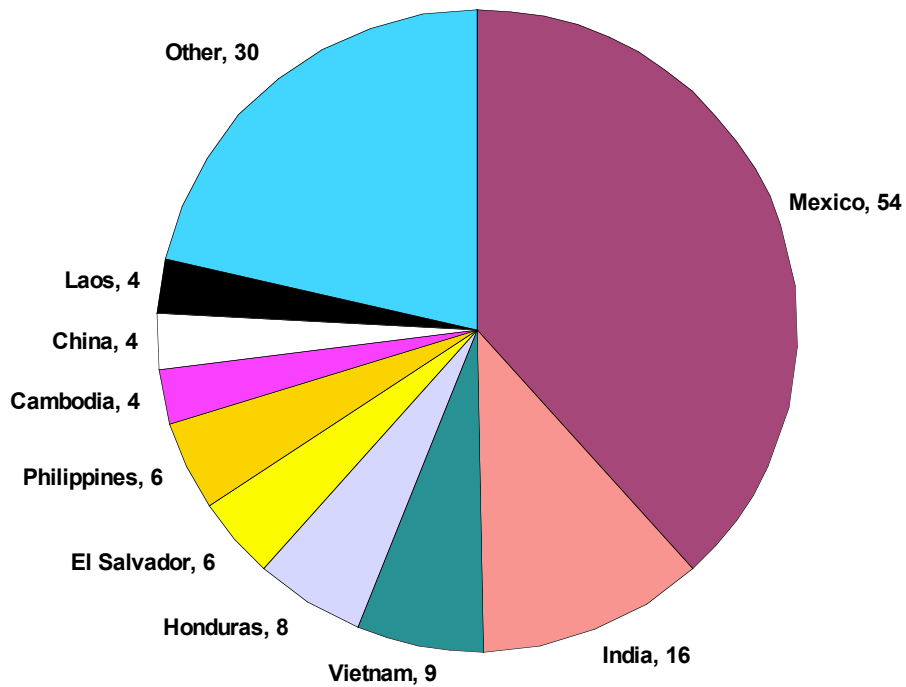
Foreign Born: Between the reporting years 2006 and 2007 there was a 5.2 percent increase in the number of foreign-born TB cases (134 and 141, respectively). (See Figure 9.) N.C. has a lower percentage of foreign-born residents in comparison to the U.S. average. The largest percentage of the state's foreign-born cases in 2007 were from Mexico (38%), followed by India (11%) and Vietnam (6%). (See Figure 10.)

Figure 9. N.C. Foreign-Born TB Cases: 2003 – 2007



DATA SOURCE: CaroTIMS.

Figure 10. Countries of Birth for 2007 Foreign-born TB Cases in N.C.



DATA SOURCE: CaroTIMS.

Pediatric Cases by Foreign-Born Status: An examination of pediatric cases by country of origin indicates that only 12 percent are foreign born. However, because children may be U.S.-born while their parents are foreign-born, this does not necessarily provide a total picture of pediatric risk factors by foreign-born status.

Table 3: Pediatric Cases by Foreign-Born Status

	2006		2007	
	U.S. BORN	FOREIGN BORN	U.S. BORN	FOREIGN BORN
0 – 4 YEARS	8	2	17	1
5 – 14 YEARS	3	3	5	2
TOTAL	11	5	22	3

DATA SOURCE: CaroTIMS.

Excessive Alcohol Use: There was a 35.4 percent decrease in the number of TB cases with reported excessive alcohol use between 2006 and 2007 (64 and 42, respectively). The overall trend from 2003 to 2007 is downward. (See Figure 11.) In 2007, 40 percent of these cases were white and 52 percent were African-American. Of those who were white, 47 percent were Hispanic and 53 percent non-Hispanic. (See Table 4.)

Figure 11. N.C. TB Cases with Excess Alcohol Use: 2003 - 2007



DATA SOURCE: CaroTIMS.

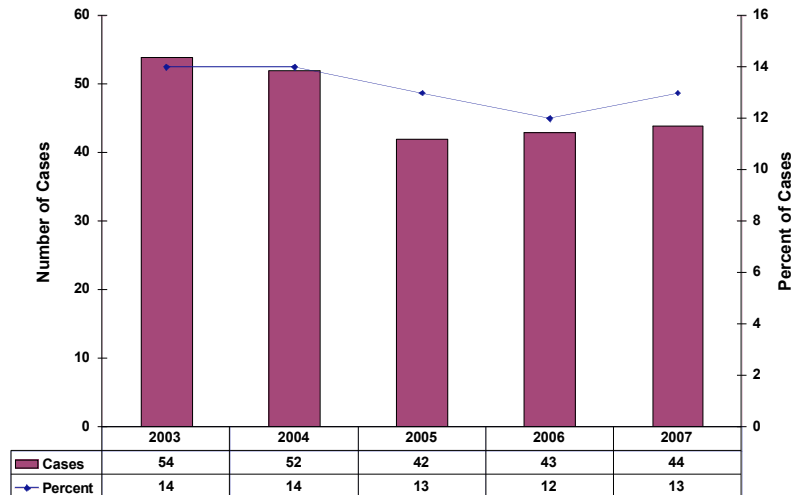
Table 4: Alcohol Use by Race and Ethnicity among N.C. TB cases 2003-2007

Year	2003		2004		2005		2006		2007	
Race	Hisp.	Non-Hisp.	Hisp.	Non-Hisp.	Hisp.	Non-Hisp.	Hisp.	Non-Hisp.	Hisp.	Non-Hisp.
White	7	21	12	13	3	9	9	15	8	9
Black	0	51	0	42	0	32	0	40	1	21
Asian	0	1	0	0	0	0	0	0	0	2
AI/AN	0	0	0	1	0	1	0	0	0	1
HI/OPI	0	0	0	0	1	0	0	0	0	0
Multiple	0	0	0	0	0	0	0	0	0	0
Total	7	73	12	56	4	42	9	55	9	33
TOTAL	87		80		68		64		42	

DATA SOURCE: CaroTIMS.

Non-Injecting Drug Use: Non-injecting drug use has been a steady problem for 12 - 14 percent of our TB patients for several years. The figures do not indicate a clear trend. (See Figure 12.)

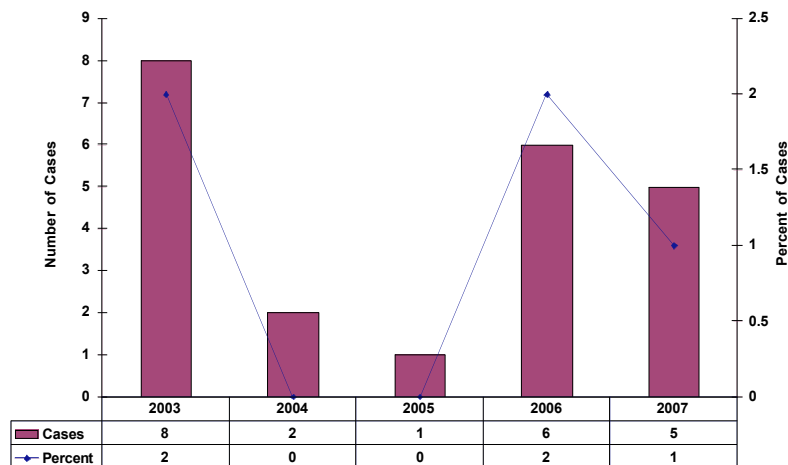
Figure 12. N.C. TB Cases with Known Non-Injecting Drug Use: 2003 – 2007



DATA SOURCE: CaroTIMS.

Injecting Drug Use: IDU has not been a significant problem for N.C. TB cases, occurring in only 0 - 2 percent of cases during any reporting year. (See Figure 13.)

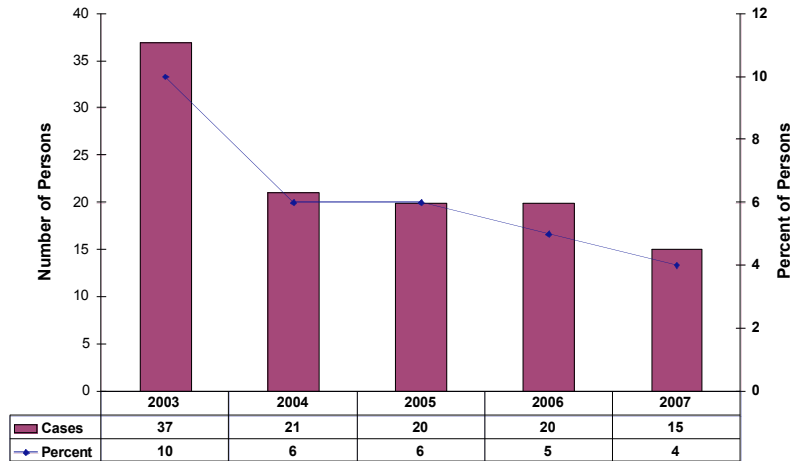
Figure 13. N.C. TB Cases with Known Injecting Drug Use: 2003 – 2007



DATA SOURCE: CaroTIMS.

Homeless: The number of reported homeless TB cases decreased from 2006 to 2007. [See Figure 14.]

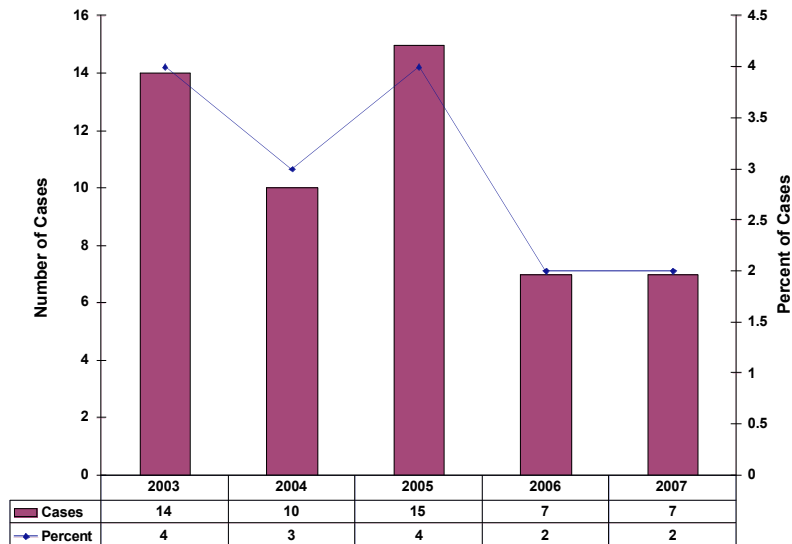
Figure 14. N.C. TB Cases Homeless in Year Prior to Diagnosis: 2003 - 2007



DATA SOURCE: CaroTIMS.

Long Term Care Facilities: The number of TB cases diagnosed in long-term care facilities during reporting years 2006 and 2007 remained constant at 7. While the numbers are somewhat small and thus difficult to interpret, the numbers seem to show a slight decrease over time. [See Figure 15.]

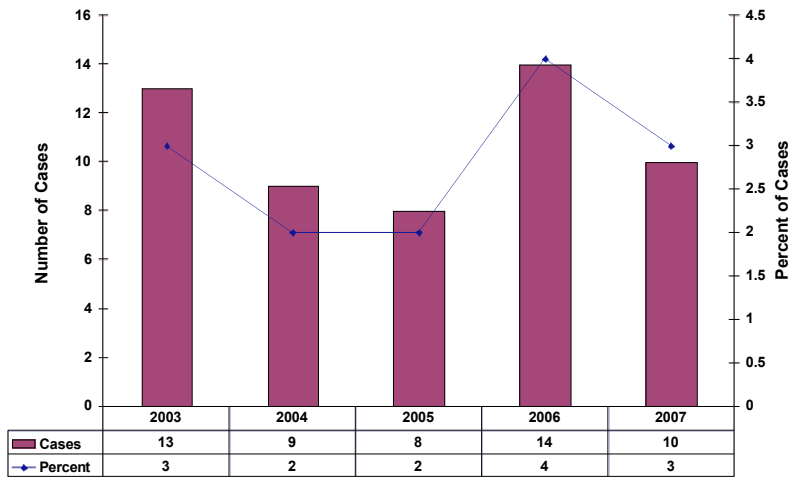
Figure 15. N.C. TB Cases That Were Residents of a Long-Term Care Facility at Time of Diagnosis: 2003 – 2007



DATA SOURCE: CaroTIMS.

Correctional Facilities: The case rate for the state’s correction population was 17.6 per 100,000 in 2007. (State Department of Correction average daily inmate population for 2007 was 38,307, and the average local jail population statewide was 18,460 for the month of January 2008.) [See Figure 16.]

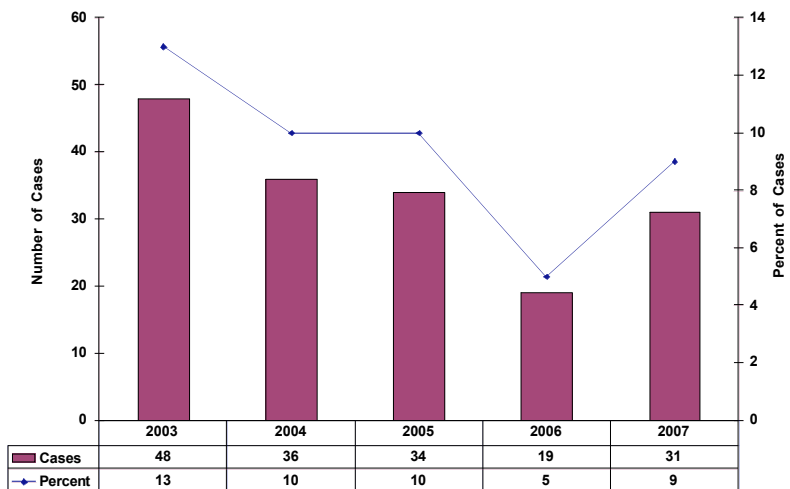
Figure 16. N.C. TB Cases Residing in Correctional Facility at Time of Diagnosis: 2003 - 2007



DATA SOURCE: CaroTIMS.; N.C. Department of Correction and DHHS Division of Facility Services, Jails and Detention January 2008 average daily population report.

HIV Status: Worldwide, co-morbidity of HIV and TB is the single largest contributor to mortality where TB disease is a factor. Figure 17 shows the number and percentage of cases that had HIV co-morbidity. Table 5 presents the distribution of HIV and TB co-morbidity by age.

Figure 17. N.C. TB Cases with HIV Infection: 2003 – 2007



DATA SOURCE: CaroTIMS.

Table 5: TB Cases with HIV Infection by Age Group 2003 - 2007

Age Group	2003	2004	2005	2006	2007
0-4	1	0	0	0	0
5-14	0	0	0	0	0
15-24	2	2	0	1	1
25-44	31	20	21	14	14
45-64	14	14	13	2	15
>65	0	0	0	2	1

DATA SOURCE: CaroTIMS.

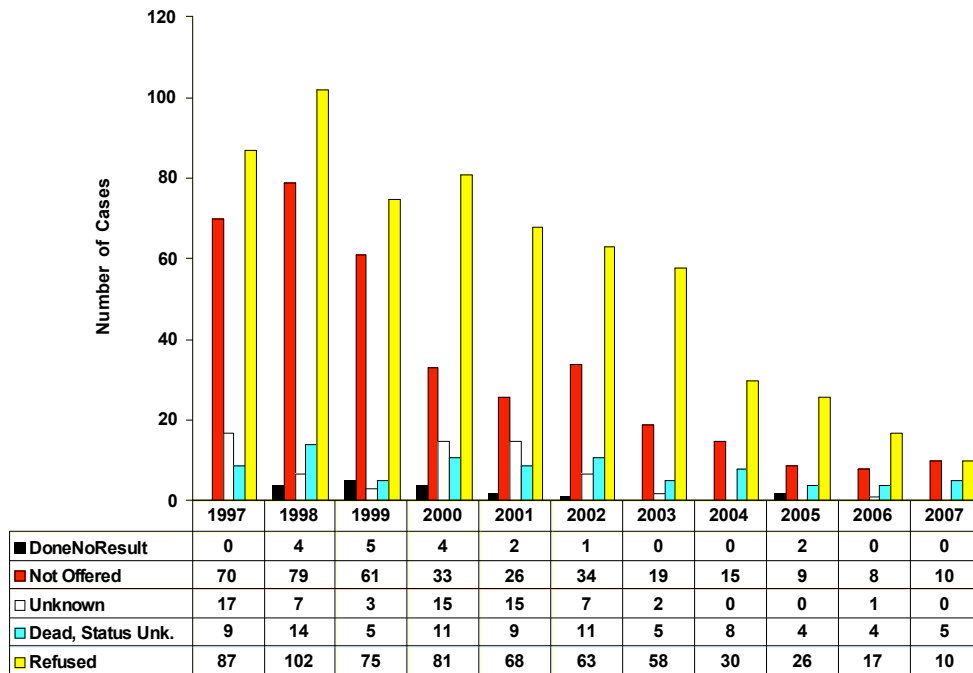
Table 6 and Figure 18 show the progress that has been made in N.C. with respect to standard of care and HIV status—namely, very few cases are not offered HIV testing, and an increasing number of TB cases are accepting the offered HIV test. The number of cases where HIV status is unknown has decreased greatly over the past 10 years. This has happened because fewer patients refuse testing (down from 18.8% in 1997 to 2.9% in 2007) and fewer patients are not being offered testing (down from 15.1% in 1997 to 2.9% in 2007).

Table 6: Reported HIV Results 2003 – 2007

Status	2003	2004	2005	2006	2007
Negative	242	292	254	325	289
Positive	48	36	34	19	31
Refused	58	30	26	17	10
Not Offered	19	15	9	8	10
Tested No Result	0	0	2	0	0
Unknown	2	0	0	1	0
Dead and Status Unknown	5	8	4	4	5

DATA SOURCE: CaroTIMS

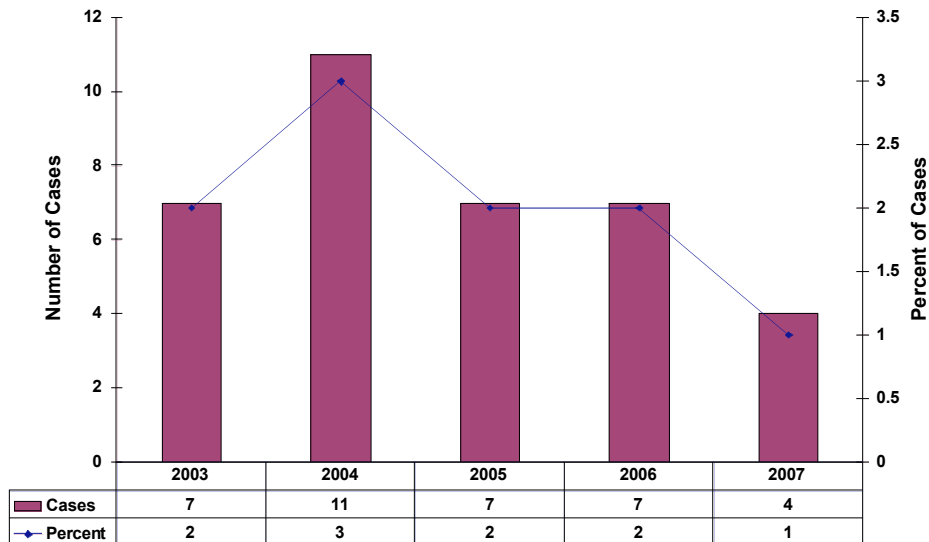
Figure 18: N.C. TB Cases with Unknown HIV Status: 1997 - 2007



DATA SOURCE: CaroTIMS

Occupation: The occurrence of TB in persons identified as healthcare workers remains an area that receives close scrutiny and intensive investigation. Figure 19 does NOT indicate TB exposure in health care settings, but rather provides an indication that there is not an overall increase in cases among those who could expose others, or be exposed to, TB.

Figure 19. N.C. Health Care Workers with TB Disease: 2003 - 2007



DATA SOURCE: CaroTIMS.

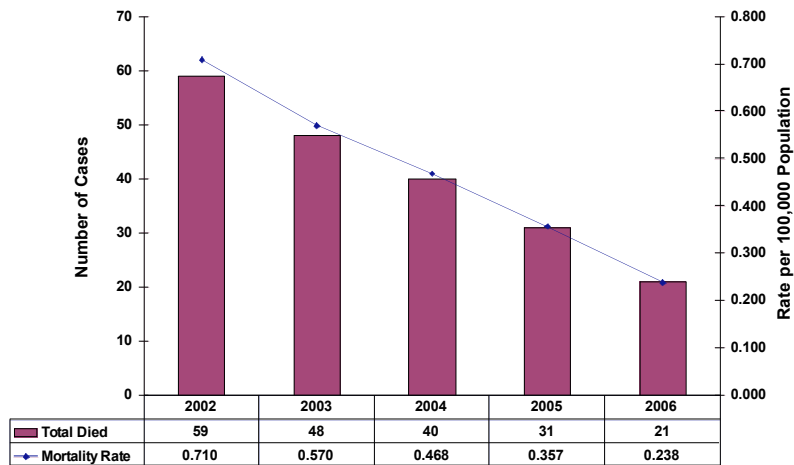
CLINICAL DATA

CLINICAL DATA FOR N.C.

Mortality of TB Cases in N.C.

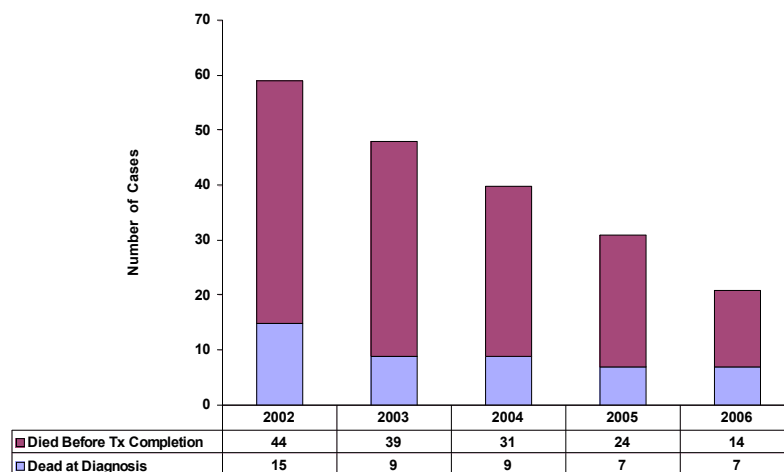
As can be seen from Figures 20 and 21, mortality of TB cases has decreased over the past 5 years. In 2002, there were 59 deaths (15 dead at diagnosis and 44 who died before completion of treatment); by 2006, there were 21 deaths (seven dead at diagnosis and 14 who died before completion of treatment). Prompt diagnosis and treatment is the key to reducing the “dead at diagnosis” category, and close coordination with primary care physicians to address co-morbidities may decrease the number who die before the end of treatment, though more research is needed to better understand the characteristics of those in the two categories.

Figure 20. N.C. TB Case Mortality and Rates: 2002 – 2006



DATA SOURCE: CaroTIMS.

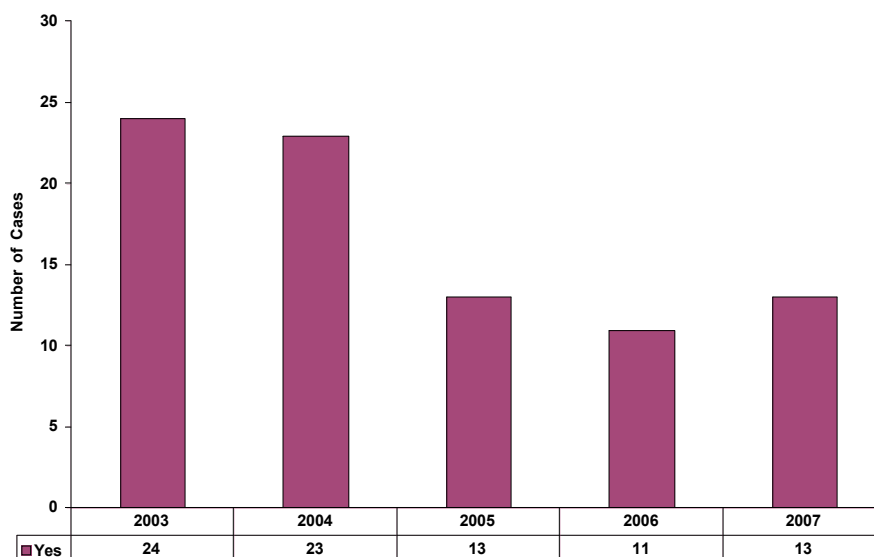
Figure 21. Timing of Death among TB Cases in N.C.: 2002 – 2006



DATA SOURCE: CaroTIMS.

Previous Diagnosis of TB: Only a few (13) TB patients in 2007 had a previous diagnosis of TB. This is down from 24 cases in 2003 and 23 cases in 2004. Again, this may be related to greater assurance of completion of therapy with directly observed therapy.

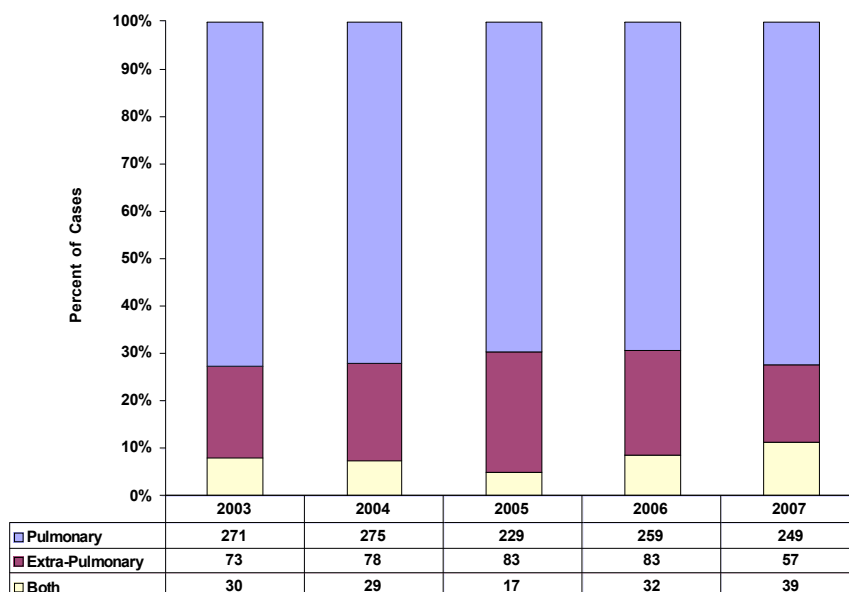
Figure 22. Previous Diagnosis of TB for TB Patients in N.C.: 2003 - 2007



DATA SOURCE: CaroTIMS.

Site of TB Disease: Figure 23 shows the number and percentage of pulmonary, extra-pulmonary and combinations of both pulmonary and extra-pulmonary sites of TB disease for years 2003 - 2007. There was no significant change from the numbers and percentages reported for years 2006 and 2007 although the percent of “both” is slightly higher for 2007. See Table 7 on page 20 for a breakdown of specific disease sites.

Figure 23. Major Site of Disease for TB Patients in N.C.: 2003 - 2007



DATA SOURCE: TIMS.

Table 7. Major Site of Disease for N.C. TB Patients: 2003 - 2007

Site	2003	2004	2005	2006	2007
Bone/Joint	11	12	16	10	7
Genitourinary	1	2	8	4	2
Lymphatic: Cervical	17	21	15	18	10
Lymphatic: Intrathoracic	4	5	5	4	4
Lymphatic: Other	10	4	1	8	5
Meningeal	3	7	5	4	5
Miliary	11	13	13	13	17
Other	13	1	6	7	4
Peritoneal	4	9	2	4	1
Pleural	12	16	14	25	19
Pulmonary	288	291	244	277	271

DATA SOURCE: CaroTIMS

TB Drug Susceptibility/Resistance Testing: Drug susceptibility testing is routinely performed on newly reported, culture-positive TB cases. In any given year, only 0 - 3 cases are reported without associated susceptibility testing. In 2007, all 274 culture-proven cases of TB had drug susceptibility reports available. Drug resistance to INH alone in N.C. decreased from 13 cases (4%) in 2003 to 6 cases (2%) in 2007. When compared to MDR-TB statistics for the United States, N.C. had 1 (0.3%) MDR-TB cases in 2006 and 2 (0.7%) MDR-TB cases in 2007, while the U.S. had 91 cases (0.9%) in 2006. Overall, the U.S. and N.C. have similar case percentages.

Table 8. First-Line Primary TB Drug Resistance in N.C. Patients: 2003-2007

Table 8 Year	First-Line Primary TB Drug Resistance Over Time 2003-2007									
	2003		2004		2005		2006		2007	
	#	%	#	%	#	%	#	%	#	%
INH ¹	13	4	9	3	12	4	14	5	6	2
INH & SM ²	6	2	10	3	8	3	8	3	3	1
MDR (INH & RIF) ³	0	0	1	0	3	1	1	0	2	1
Any Other Drug Resistance	11	4	9	3	19	7	13	4	15	5
<i>Total Drug Resistance</i>	<i>30</i>	<i>10</i>	<i>29</i>	<i>10</i>	<i>42</i>	<i>15</i>	<i>36</i>	<i>12</i>	<i>25</i>	<i>9</i>
**Total Positive Cultures	294		289		271		302		274	

DATA SOURCE: CaroTIMS.

**Total positive cultures with susceptibility results known.

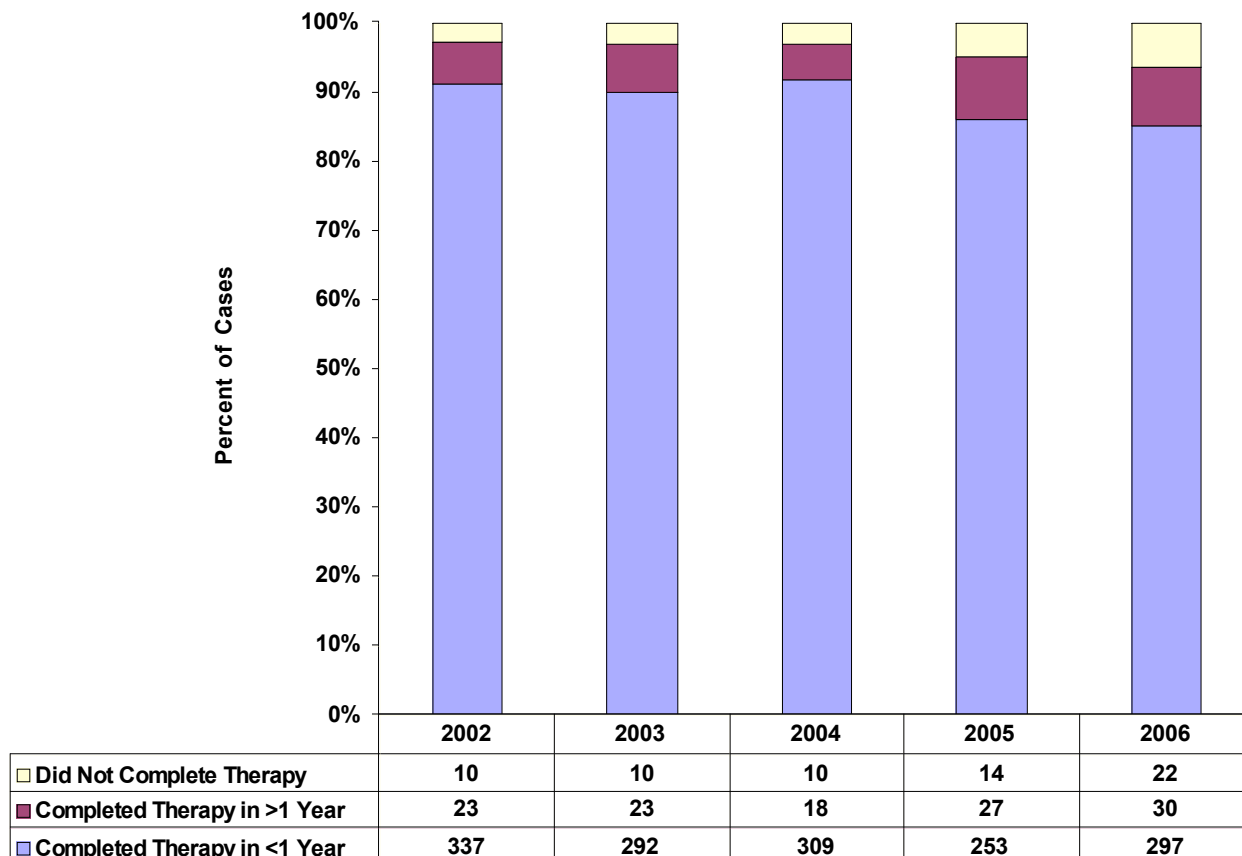
¹Includes INH and any other drugs except SM or RIF. Resistance may have been found at either initial or final testing.

²Includes INH, SM and any other drugs except RIF. Resistance may have been found at either initial or final testing.

³Includes INH, RIF and any other drugs including SM. Resistance may have been found at either initial or final testing.

Completion of Therapy: Completion of therapy within one year remained between 90 percent and 92 percent between 2002 and 2004; however, in 2005, there was a drop to 86 percent. In 2006, N.C. passed legislation requiring all TB cases be placed on DOT. This is expected to increase the percentage of cases completing therapy within one year. In 2006, 96.4 percent of cases were totally directly observed and 2.2 percent were both directly observed and self- administered.

Figure 24. Patients Completing Therapy in N.C.: 2002 – 2006



DATA SOURCE: CaroTIMS. This includes all patients who were alive at diagnosis, did not die during treatment and who were not Rifampin-resistant.

SUPPLEMENTAL TABLES

Table 9: TB Cases and Case Rates by County 2003-2007

COUNTY	2003		2004		2005		2006		2007	
	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE
Alamance	5	3.7	3	2.2	3	2.2	3	2.3	3	2.1
Alexander	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Alleghany	2	18.5	2	18.4	0	0.0	0	0.0	0	0.0
Anson	2	7.9	1	3.9	1	3.9	1	3.9	2	7.7
Ashe	2	8.0	0	0.0	0	0.0	0	0.0	0	0.0
Avery	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Beaufort	4	8.8	0	0.0	3	6.5	6	13.3	2	4.2
Bertie	4	20.2	7	35.6	0	0.0	0	0.0	3	15.4
Bladen	1	3.1	1	3.0	3	9.1	1	3.1	0	0.0
Brunswick	1	1.2	1	1.2	2	2.2	1	1.4	2	2.1
Buncombe	3	1.4	3	1.4	4	1.8	2	1.0	13	5.7
Burke	3	3.4	6	6.8	4	4.5	2	2.2	0	0.0
Cabarrus	5	3.5	8	5.5	3	2.0	4	3.0	1	0.6
Caldwell	1	1.3	1	1.3	2	2.5	1	1.3	6	7.3
Camden	1	12.7	0	0.0	0	0.0	0	0.0	0	0.0
Carteret	1	1.6	0	0.0	0	0.0	2	3.4	1	1.5
Caswell	1	4.2	0	0.0	0	0.0	0	0.0	2	8.3
Catawba	1	0.7	1	0.7	3	2.0	1	0.7	4	2.5
Chatham	0	0.0	0	0.0	3	5.3	2	4.0	0	0.0
Cherokee	0	0.0	1	3.9	0	0.0	1	4.1	0	0.0
Chowan	0	0.0	4	27.7	1	6.9	2	14.1	0	0.0
Clay	0	0.0	0	0.0	0	0.0		0.0	0	0.0
Cleveland	2	2.1	0	0.0	2	2.1	4	4.1	3	3.0
Columbus	4	7.3	7	12.8	5	9.2	2	3.7	5	8.9
Craven	0	0.0	1	1.1	0	0.0	1	1.1	6	6.2
Cumberland	16	5.2	8	2.6	6	2.0	9	3.0	7	2.3
Currituck	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Dare	0	0.0	0	0.0	4	11.5	0	0.0	1	2.9
Davidson	2	1.3	3	2.0	3	1.9	6	4.1	8	5.0
Davie	0	0.0	3	7.9	0	0.0	0	0.0	0	0.0
Duplin	2	3.9	3	5.8	6	11.6	5	10.2	6	11.1
Durham	10	4.2	27	11.3	21	8.7	12	5.3	8	3.2
Edgecombe	5	9.3	1	1.9	3	5.7	4	7.2	3	5.4
Forsyth	16	5.0	12	3.7	13	4.0	14	4.6	11	3.2
Franklin	1	1.9	2	3.8	2	3.7	0	0.0	2	3.5
Gaston	3	1.6	5	2.6	1	0.5	2	1.0	4	2.0
Gates	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Graham	1	12.4	0	0.0	0	0.0	0	0.0	0	0.0
Granville	4	7.6	1	1.9	1	1.9	1	2.0	1	1.8
Greene	4	20.1	2	10.0	0	0.0	0	0.0	0	0.0
Guilford	31	7.2	27	6.2	32	7.2	38	9.0	27	5.8

COUNTY (cont.)	2003		2004		2005		2006		2007	
	CASES	RATE	CASES	RATE	CASES	COUNTY	CASES	RATE	CASES	RATE
Halifax	5	8.8	3	5.3	2	3.6	5	8.7	3	5.3
Harnett	2	2.0	4	4.0	3	3.0	4	4.4	3	2.8
Haywood	2	3.6	1	1.8	0	0.0	1	1.8	2	3.5
Henderson	6	6.3	5	5.2	2	2.0	2	2.2	0	0.0
Hertford	2	8.4	3	12.6	1	4.2	2	8.7	1	4.1
Hoke	1	2.7	0	0.0	5	12.3	4	11.8	1	2.3
Hyde	0	0.0	1	17.8	0	0.0	1	17.1	0	0.0
Iredell	2	1.5	2	1.5	2	1.4	2	1.6	3	2.0
Jackson	1	2.9	0	0.0	0	0.0	0	0.0	0	0.0
Johnston	7	5.1	9	6.4	4	2.7	4	3.2	8	5.1
Jones	1	9.8	0	0.0	0	0.0	1	9.6	0	0.0
Lee	2	3.9	4	7.6	1	1.9	1	2.0	3	5.2
Lenoir	6	10.2	3	5.1	3	5.1	7	11.8	4	6.8
Lincoln	0	0.0	2	2.9	0	0.0	1	1.6	0	0.0
Macon	0	0.0	1	3.1	1	3.1	0	0.0	0	0.0
Madison	1	5.0	0	0.0	1	4.9	0	0.0	0	0.0
Martin	4	16.0	1	4.0	1	4.1	2	7.8	1	4.8
McDowell	1	2.3	0	0.0	1	2.3	0	0.0	0	0.0
Mecklenburg	47	6.3	53	6.9	48	6.0	55	7.9	34	4.0
Mitchell	0	0.0	0	0.0	0	0.0	0	0.0	1	6.2
Montgomery	4	14.6	2	7.4	11	40.2	16	59.6	4	14.1
Moore	2	2.5	4	5.0	3	3.7	1	1.3	1	1.2
Nash	4	4.5	6	6.6	7	7.6	6	6.9	4	4.2
New Hanover	15	8.9	6	3.4	5	2.8	10	6.2	6	3.2
Northampton	1	4.6	2	9.3	2	9.3	1	4.5	2	9.2
Onslow	2	1.3	2	1.3	0	0.0	3	2.0	3	1.9
Orange	4	3.3	3	2.5	1	0.8	2	1.7	9	7.3
Pamlico	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Pasquotank	5	13.7	1	2.7	1	2.6	1	2.9	1	2.5
Pender	3	6.9	5	11.1	2	4.3	1	2.4	3	6.0
Perquimans	0	0.0	0	0.0	1	8.2	1	8.8	0	0.0
Person	1	2.7	0	0.0	1	2.7	3	8.4	0	0.0
Pitt	5	3.6	7	5.0	5	3.5	5	3.7	11	7.4
Polk	1	5.3	0	0.0	1	5.3	0	0.0	0	0.0
Randolph	5	3.7	1	0.7	0	0.0	1	0.8	1	0.7
Richmond	2	4.3	3	6.5	0	0.0	1	2.1	0	0.0
Robeson	11	8.8	6	4.7	14	11.0	14	11.3	17	12.9
Rockingham	5	5.4	0	0.0	0	0.0	3	3.3	3	3.2
Rowan	0	0.0	7	5.3	0	0.0	5	3.8	2	1.4
Rutherford	0	0.0	1	1.6	0	0.0	0	0.0	0	0.0
Sampson	6	9.6	11	17.6	4	6.3	2	3.3	1	1.5
Scotland	1	2.8	1	2.7	1	2.7	3	8.3	5	13.2

COUNTY (cont.)	2003		2004		2005		2006		2007	
	CASES	RATE	CASES	RATE	CASES	COUNTY	CASES	RATE	CASES	RATE
Stanly	2	3.4	5	8.5	2	3.4	2	3.4	1	1.6
Stokes	1	2.2	0	0.0	0	0.0	0	0.0	0	0.0
Surry	2	2.8	0	0.0	0	0.0	0	0.0	0	0.0
Swain	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Transylvania	1	3.4	0	0.0	0	0.0	0	0.0	1	3.3
Tyrrell	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Union	3	2.1	2	1.3	2	1.2	0	0.0	3	1.7
Vance	1	2.3	0	0.0	1	2.3	0	0.0	2	4.5
Wake	46	6.6	53	7.3	34	4.5	52	8.2	54	6.7
Warren	0	0.0	1	5.0	2	9.9	0	0.0	2	10.0
Washington	2	14.8	1	7.4	1	7.5	4	29.2	0	0.0
Watauga	0	0.0	0	0.0	1	2.3	0	0.0	0	0.0
Wayne	5	4.4	9	7.8	16	13.8	8	7.1	9	7.7
Wilkes	1	1.5	1	1.5	1	1.5	2	3.0	1	1.5
Wilson	5	6.6	8	10.5	4	5.2	7	9.5	4	5.1
Yadkin	0	0.0	0	0.0	0	0.0	1	2.7	0	0.0
Yancey	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
North Carolina	374	4.4	382	4.5	329	3.8	374	4.6	345	3.8

DATA SOURCE: CaroTIMS.

†Denominators for computing rates for the state were obtained from the Annual Estimates of the Population for the United States and States, and for Puerto Rico. County case rates were calculated using the population estimates/projections (as of July 1) for the corresponding year as provided by the N.C. State Data Center. 2007 rates for counties were calculated based on the 2006 population estimates with the strata inflated to reflect the 2.3% increase of the total N.C. population from 2006 to 2007.

Table 10: Foreign-Born TB Cases by County 2003-2007

Foreign-Born TB Cases by County 2003-2007						
County	2003	2004	2005	2006	2007	Total Cases 2003 - 2007
Alamance	1	0	0	0	1	2
Alexander	0	0	0	0	0	0
Alleghany	0	0	0	0	0	0
Anson	0	0	0	0	0	0
Ashe	0	0	0	0	0	0
Avery	0	0	0	0	0	0
Beaufort	1	0	0	1	1	3
Bertie	1	1	0	0	0	2
Bladen	0	0	0	1	0	1
Brunswick	0	0	1	0	1	2
Buncombe	1	0	3	1	6	11
Burke	0	2	2	1	0	5
Cabarrus	3	3	3	1	1	11
Caldwell	1	0	0	0	0	1
Camden	1	0	0	0	0	1
Carteret	1	0	0	0	0	1
Caswell	0	0	0	0	0	0
Catawba	0	0	1	1	3	5
Chatham	0	0	1	1	0	2
Cherokee	0	0	0	1	0	1
Chowan	0	0	0	2	0	2
Clay	0	0	0	0	0	0
Cleveland	1	0	0	0	0	1
Columbus	1	2	1	0	1	5
Craven	0	0	0	0	2	2
Cumberland	2	2	1	1	0	6
Currituck	0	0	0	0	0	0
Dare	0	0	2	0	0	2
Davidson	0	0	1	4	6	11
Davie	0	3	0	0	0	3
Duplin	1	1	2	0	5	9
Durham	8	13	7	5	3	36
Edgecombe	1	0	0	0	0	1
Forsyth	6	4	7	8	8	33
Franklin	1	0	1	0	2	4
Gaston	1	1	1	0	2	5
Gates	0	0	0	0	0	0
Graham	0	0	0	0	0	0
Granville	3	1	0	0	0	4
Greene	1	0	0	0	0	1
Guilford	12	7	13	22	14	68
Halifax	0	0	0	0	0	0

Table 10: Foreign-Born TB Cases by County 2003-2007 (continued)

County	2003	2004	2005	2006	2007	Total Cases 2003 – 2007
Harnett	3	0	1	1	1	3
Haywood	0	0	0	0	0	0
Henderson	3	3	1	1	0	8
Hertford	0	0	0	0	0	0
Hoke	0	0	1	1	0	2
Hyde	0	1	0	0	0	1
Iredell	1	1	0	1	1	4
Jackson	0	0	0	0	0	0
Johnston	2	2	0	1	1	6
Jones	0	0	0	0	0	0
Lee	0	1	0	1	2	4
Lenoir	0	0	0	1	0	1
Lincoln	0	0	0	1	0	1
Macon	0	1	0	0	0	1
Madison	0	0	1	0	0	1
Martin	0	0	0	0	0	0
McDowell	0	0	0	0	0	0
Mecklenburg	14	23	25	27	21	110
Mitchell	0	0	0	0	0	0
Montgomery	1	0	1	0	1	3
Moore	1	2	1	0	1	5
Nash	1	4	2	2	0	9
New Hanover	1	1	2	5	1	10
Northampton	0	0	0	0	0	0
Onslow	1	1	0	1	2	5
Orange	3	1	1	0	6	11
Pamlico	0	0	0	0	0	0
Pasquotank	1	1	0	0	1	3
Pender	2	1	1	1	1	6
Perquimans	0	0	0	0	0	0
Person	0	0	0	3	0	3
Pitt	0	1	0	1	1	3
Polk	1	0	1	0	0	2
Randolph	4	1	0	0	0	5
Richmond	1	1	0	1	0	3
Robeson	1	0	2	0	1	4
Rockingham	1	0	0	0	2	3
Rowan	0	4	0	1	1	6
Rutherford	0	0	0	0	0	0
Sampson	1	7	0	2	0	10
Scotland	0	0	0	0	0	0
Stanly	0	1	0	0	0	1
Stokes	0	0	0	0	0	0

Table 10: Foreign-Born TB Cases by County 2003-2007 (continued)						
County	2003	2004	2005	2006	2007	Total Cases 2003 - 2007
Surry	0	0	0	0	0	0
Swain	0	0	0	0	0	0
Transylvania	0	0	0	0	1	1
Tyrrell	0	0	0	0	0	0
Union	2	1	1	0	2	6
Vance	0	0	0	0	0	0
Wake	19	30	17	31	35	132
Warren	0	0	0	0	0	0
Washington	0	0	0	1	0	1
Watauga	0	0	1	0	0	1
Wayne	2	5	4	0	2	13
Wilkes	0	1	0	1	1	3
Wilson	0	0	0	1	0	1
Yadkin	0	0	0	0	0	0
Yancey	0	0	0	0	0	0
North Carolina	111	135	110	137	141	634

DATA SOURCE: CaroTIMS.

Table 11: Foreign-Born Cases by Country of Origin 2003-2007

Year	2003	2004	2005	2006	2007	Total Cases 2003 - 2007
Albania	0	0	0	1	1	2
Algeria	1	0	1	1	0	3
Argentina	0	2	0	0	0	1
Azerbaijan	0	0	1	0	0	1
Bangladesh	0	0	1	0	0	1
Belarus	0	0	1	0	0	1
Bosnia & Herzegovina	0	0	1	0	0	1
Brazil	0	0	0	1	0	1
British Virgin Islands	0	0	0	0	1	1
Burma	1	0	0	1	1	3
Cambodia	0	0	2	9	4	15
China	4	2	1	3	4	14
Colombia	0	0	1	2	1	4
Congo	2	1	3	1	0	7
Cuba	0	0	0	1	0	1
Djibouti	1	0	0	0	0	1
Dominican Republic	0	0	0	1	0	1
Ecuador	0	2	0	1	2	5
El Salvador	2	1	2	3	6	14
Ethiopia	1	5	3	5	3	17
France	0	1	0	0	0	1
Gabon	1	0	0	0	0	1
Gambia	0	1	1	0	0	2
Ghana	0	0	0	0	1	1
Guadeloupe	0	1	0	0	0	1
Guatemala	4	5	2	3	3	17
Haiti	1	0	0	0	1	2
Honduras	4	7	6	6	8	31
India	7	7	7	14	16	51
Indonesia	2	1	1	1	3	8
Iran	0	1	0	0	0	1
Ireland	0	1	0	0	0	1
Ivory Coast	0	0	0	1	0	1
Japan	0	1	0	0	0	1
Kazakhstan	0	0	0	1	0	1
Kenya	1	4	0	2	3	10
Korea Democratic Peoples Rep.	0	1	0	1	1	3
Korea Republic of	2	3	1	0	2	8
Kuwait	0	1	0	0	0	1
Laos	0	2	1	1	4	8

**Table 11: Foreign-Born Cases by Country of Origin 2003-2007
(continued)**

Year	2003	2004	2005	2006	2007	Total Cases 2003 - 2007
Liberia	0	0	4	2	2	8
Malaysia	1	0	0	0	1	2
Mexico	48	54	44	44	54	244
Morocco	0	0	0	0	2	2
Nepal	0	1	1	2	1	5
Nicaragua	0	0	1	0	0	1
Niger	1	0	1	1	0	3
Nigeria	0	0	1	0	0	1
Pakistan	1	0	0	2	0	3
Peru	3	1	2	1	1	8
Philippines	4	7	4	3	6	24
Pitcairn Islands	1	0	0	0	0	1
Romania	1	0	0	1	0	2
Senegal	0	1	1	0	0	2
Sierra Leone	1	0	0	0	0	1
Somalia	1	1	1	1	0	4
South Africa	1	0	1	0	0	2
Soviet Union	0	1	1	0	0	2
Sudan	0	1	0	0	0	1
Syria	1	0	0	0	0	1
Taiwan	0	0	1	0	0	1
Thailand	2	1	0	1	0	4
Togo	1	0	0	0	0	1
Turkey	0	0	0	1	0	1
Ukraine	0	0	1	0	0	1
Uruguay	0	0	0	1	0	1
Vietnam	7	12	8	16	9	52
Zaire	1	1	0	0	0	2
Zambia	1	0	0	0	0	1
Total	110	131	110	135	141	627

DATA SOURCE: CaroTIMS.

Table 12: Hispanic TB Cases by County 2003-2007

Hispanic TB Cases by County 2003-2007						
County	2003	2004	2005	2006	2007	Total Cases 2003 - 2007
Alamance	2	0	0	1	2	5
Alexander	0	0	0	0	0	0
Alleghany	0	0	0	0	0	0
Anson	0	0	0	0	0	0
Ashe	0	0	0	0	0	0
Avery	0	0	0	0	0	0
Beaufort	1	0	0	0	1	2
Bertie	1	1	0	0	0	2
Bladen	0	0	0	1	0	1
Brunswick	0	0	0	0	0	0
Buncombe	1	1	3	1	13	19
Burke	0	2	2	1	0	5
Cabarrus	3	2	2	1	0	8
Caldwell	1	0	0	0	0	1
Camden	1	0	0	0	0	1
Carteret	0	0	0	0	0	0
Caswell	0	0	0	0	0	0
Catawba	0	0	2	1	2	5
Chatham	0	0	1	1	0	2
Cherokee	0	0	0	1	0	1
Chowan	0	0	0	2	0	2
Clay	0	0	0	0	0	0
Cleveland	0	0	0	0	0	0
Columbus	1	2	1	0	2	6
Craven	0	0	0	0	2	2
Cumberland	2	0	1	1	0	4
Currituck	0	0	0	0	0	0
Dare	0	0	2	0	0	2
Davidson	0	0	0	3	3	6
Davie	0	3	0	0	0	3
Duplin	1	1	3	1	6	12
Durham	4	8	7	2	2	23
Edgecombe	1	0	0	0	0	1
Forsyth	6	2	3	8	5	24
Franklin	1	0	1	0	2	4
Gaston	1	0	0	0	1	2
Gates	0	0	0	0	0	0
Graham	0	0	0	0	0	0

Hispanic TB Cases by County 2003-2007 (continued)						
County	2003	2004	2005	2006	2007	Total Cases 2003 - 2007
Granville	3	1	0	0	0	4
Greene	1	0	0	0	0	1
Guilford	0	1	3	5	5	14
Halifax	0	0	0	0	0	0
Harnett	0	0	1	0	1	2
Haywood	0	0	0	0	0	0
Henderson	3	3	1	0	0	7
Hertford	0	0	0	0	0	0
Hoke	0	0	1	1	0	2
Hyde	0	1	0	1	0	2
Iredell	1	0	2	0	1	4
Jackson	0	0	0	0	0	0
Johnston	2	1	1	1	3	8
Jones	0	0	0	0	0	0
Lee	0	1	0	1	2	4
Lenoir	0	0	0	1	0	1
Lincoln	0	0	0	1	0	1
Macon	0	1	0	0	0	1
Madison	0	0	1	0	0	1
Martin	0	0	0	0	0	0
McDowell	0	0	0	0	0	0
Mecklenburg	9	11	13	10	12	55
Mitchell	0	0	0	0	0	0
Montgomery	1	0	1	1	1	4
Moore	0	1	1	0	0	2
Nash	1	3	2	2	0	8
New Hanover	1	0	2	5	1	9
Northampton	0	0	0	0	0	0
Onslow	0	0	0	1	0	1
Orange	0	0	1	1	5	7
Pamlico	0	0	0	0	0	0
Pasquotank	2	1	0	0	0	3
Pender	2	1	1	1	2	7
Perquimans	0	0	0	0	0	0
Person	0	0	0	3	0	3
Pitt	0	1	0	0	1	2
Polk	1	0	0	0	0	1
Randolph	4	0	0	0	0	4
Richmond	1	1	0	1	0	3

Hispanic TB Cases by County 2003-2007 (continued)						
County	2003	2004	2005	2006	2007	Total Cases 2003 - 2007
Robeson	1	0	1	0	1	3
Rockingham	1	0	0	0	1	2
Rowan	0	4	0	1	0	5
Rutherford	0	0	0	0	0	0
Sampson	0	7	1	2	0	10
Scotland	0	0	0	0	0	0
Stanly	0	1	0	1	0	2
Stokes	0	0	0	0	0	0
Surry	0	0	0	0	0	0
Swain	0	0	0	0	0	0
Transylvania	0	0	0	0	1	1
Tyrrell	0	0	0	0	0	0
Union	2	1	2	0	2	7
Vance	0	0	0	0	0	0
Wake	6	21	5	8	18	58
Warren	0	0	0	0	0	0
Washington	0	0	0	1	0	1
Watauga	0	0	1	0	0	1
Wayne	2	5	3	0	3	13
Wilkes	0	1	0	1	0	2
Wilson	0	0	0	1	0	1
Yadkin	0	0	0	0	0	0
Yancey	0	0	0	0	0	0
North Carolina	69	91	72	75	101	408

DATA SOURCE: CaroTIMS.