

2009 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

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Department of Health and Human Services • Lanier Cansler, Secretary
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HIGHLIGHTS

Thirty-five jurisdictions across the US experienced declines in number of cases from 2008 to 2009. The decrease in cases in the United States was 10.6 percent. In North Carolina, an even greater decline was observed, with 25 percent fewer cases of tuberculosis reported in 2009 as compared to 2008, ranking North Carolina eighth in the nation in decline in number of cases.

An obvious explanation for the decline in N.C. cases would have been shifts in immigration/migration patterns, presumably due to a lack of available employment for new immigrant populations. However, the proportion of foreign-born cases in 2009 was almost exactly the same as in 2008, which is not consistent with this hypothesis. A second hypothesis would be that persons are delaying medical care (also presumably because of economic factors), resulting in delayed TB diagnosis and a shift of 2009 cases into 2010. The data also do not support that hypothesis -- the proportion of persons with cavitory disease, smear-positive disease, and who died prior to TB diagnosis were not significantly different in 2009 than in 2008.

A third hypothesis would be problems with the reporting system (NC EDSS). NC has carefully monitored these numbers and every case diagnosed and reported in the two largest counties is in NC EDSS. In both counties, 2009 cases significantly decreased from 2008.

Demographics:

- North Carolina is ranked as the 26th highest state for case rates in the United States in 2009. This can be viewed as significant progress -- in 1980, North Carolina was ranked as the 3rd highest state for case rate.
- The number of TB cases in 2009 was 250. Since 1980, TB cases in North Carolina have decreased by almost five percent per year. As a result, the total number of cases in 2009 was only 23 percent of the total number of cases for 1980 (that is 250 cases compared to 1066 cases).
- In 2009, 52 percent of all cases were located in eight counties: Mecklenburg (33), Wake (22), Guilford (21), Robeson (16), Durham (12), Cumberland (9), Forsyth (8), and Wayne (8). The case rate was higher than the state rate in all but two of these (Wake and Forsyth). There were 38 counties with no TB cases in 2009.
- While the number of Asians with TB increased by 4 percent between 2005 and 2009, the case rate for Asians decreased from 19.1 to 16.1 per 100,000 population.
- The number of African-Americans with TB decreased by 32.7 percent from 2005 to 2009. The rate for African-Americans decreased from 9.0 to 5.3 per 100,000 population.
- The number of Hispanics with TB decreased by 25 percent from 2005 to 2009; the rate during this same time period decreased from 13.5 to 7.8 per 100,000 population. Of the 387 total Hispanic cases between 2005 and 2009, 189 (49%) were located in six counties: Wake (53), Mecklenburg (52), Forsyth (29), Buncombe (21), Durham (17), and Guilford (17).
- With the exception of ages 5 – 14, the number of cases decreased for every age group with the greatest percentage decrease being in ages 65 and older (49.3% decrease between 2005 and 2009). Rates for males declined much more (40%) than for females (14%).

Risk Factors:

- Most (64%) 2009 TB cases in North Carolina 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. Nineteen percent have two or more of these risk factors
- The percent of cases that are foreign-born increased from 33 percent to 37 percent between 2005 and 2009. Sixty-one percent of all foreign born cases of TB in 2008 came from four countries: Mexico (36%); Vietnam (11%), Guatemala (8%), and India (6%). For the five year period from 2005 to 2009, there were a total of 599 foreign-born cases. Of these, 381 cases came from five countries: Mexico (216), India (54), Vietnam (54), Honduras (33), and the Philippines (29). Of the total, 368 located in five counties: Wake (120), Mecklenburg (102), Guilford (75), Forsyth (39), and Durham (32). Eleven percent of pediatric cases (0-14) were foreign-born in 2009.
- TB cases with excessive alcohol use reported increased from 14 percent in 2005 to 17 percent in 2009. Most of the people with excessive alcohol use are non-Hispanic U.S. born.
- Homeless cases remained fairly stable -- 6% in 2005 and 6% in 2009.
- HIV reporting for TB cases has increased significantly from 1998 to 2009. Since November of 2007, the standard of care has been to offer HIV testing as part of routine screening. Patients are informed that HIV testing is part of the screening and may decide to “opt-out” of that test. Before this standard of care was official, N.C. TB nurse consultants spent a lot of time training in local health departments to encourage HIV testing for TB suspects/cases. Consequently, the number of cases where HIV status is unknown has decreased greatly over the past 10 years. In 1998, there were 207 persons (42%) for whom HIV testing was not offered, not known, or refused by patient. In 2009, there were 16 persons (6%) for whom HIV testing was not offered, not known or refused by patient.

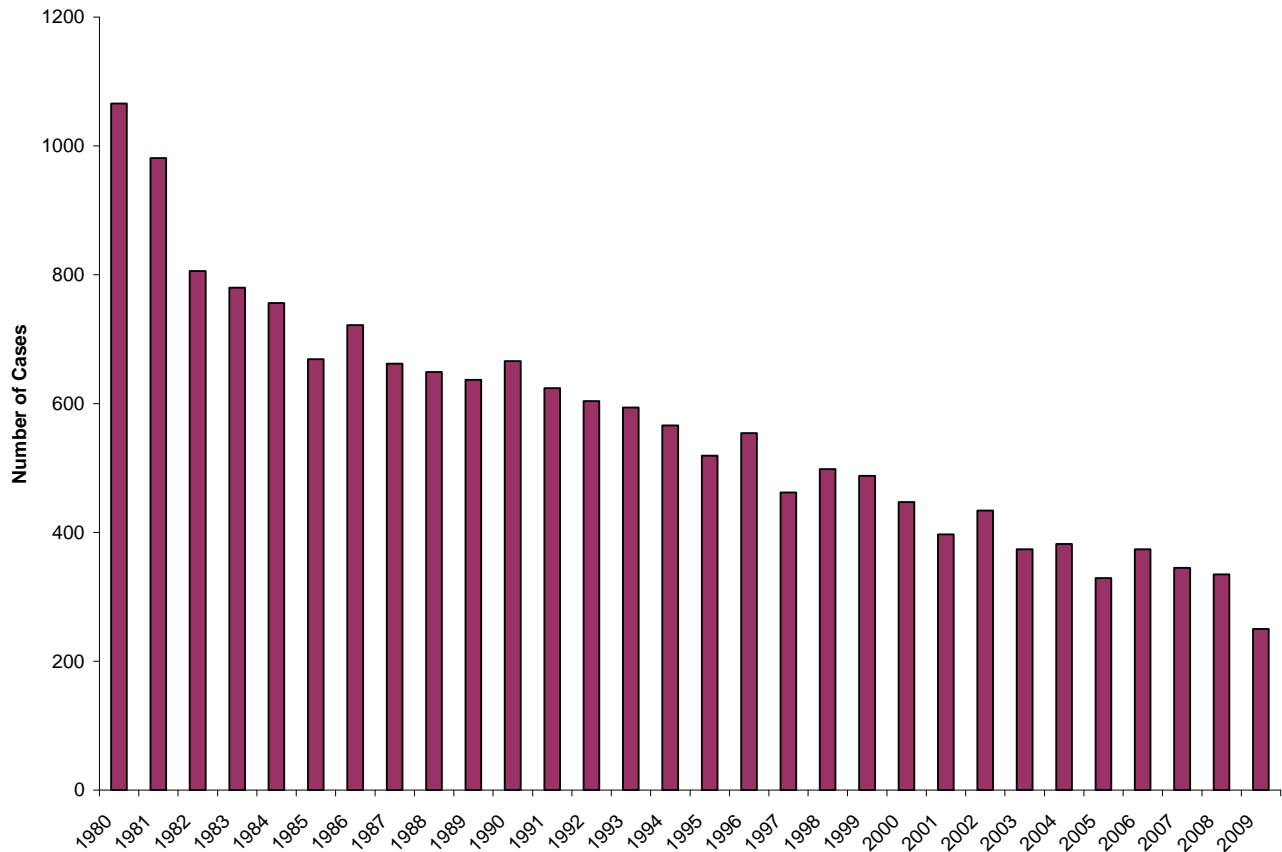
Clinical data:

- Mortality of tuberculosis cases during treatment greatly decreased from 2004 to 2008. The number of cases where death occurred during treatment was 31 in 2004 and 13 by 2008. Additionally, there were 9 persons dead at diagnosis in 2004 and 6 in 2008.
- Previous diagnosis of tuberculosis decreased from 23 in 2004 to 6 in 2009.
- The major site of disease for TB cases in 2009 was predominately pulmonary (189), followed by lymphatic: cervical (16) and pleural (16).
- While the number of cases resistant to INH in North Carolina (NC) was the same in 2009 as in 2005, the percentage of cases for 2009 (6%) was higher than for 2005 (4%). Between 2005 and 2009 the number of MDR cases has ranged from 1 to 3 cases per year.
- In 2008, 99.0 percent of all cases were either totally directly observed or directly observed for at least 26 weeks. The percentage of 2008 cases that completed therapy in one year (when expected to complete therapy in one year) was 90.8 percent with another 5.6 percent completing after one year. Only 3.6 percent did not complete –five were lost to follow-up, two moved to Mexico (care provided by CURE TB), one moved out of state, and two are still on therapy (one left the country and returned but did not tolerate Rifampin/Rifabutin and one had slow response).

DEMOGRAPHICS

DEMOGRAPHIC CHARACTERISTICS

Figure 1. Reported TB Cases in N.C.: 1980 - 2009

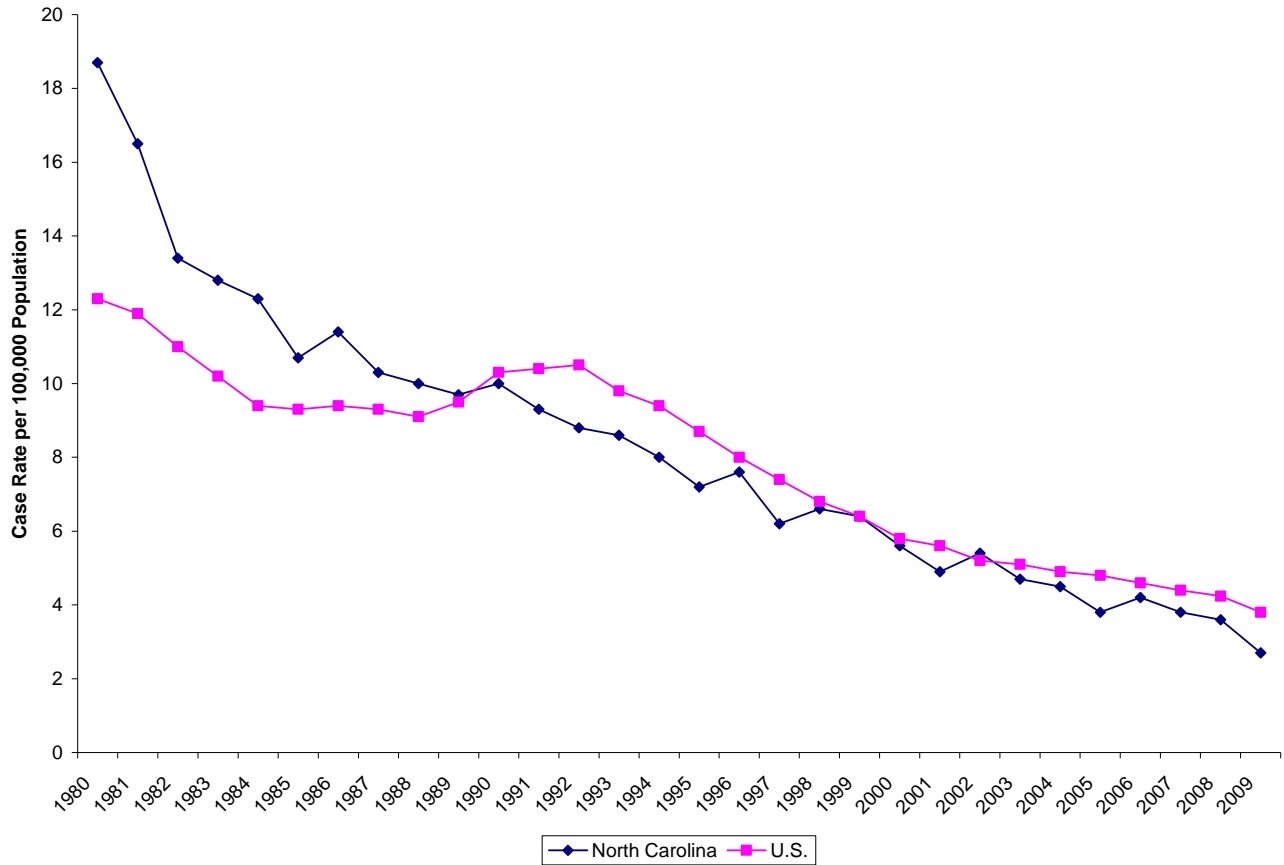


DATA SOURCE: CaroTIMS and NC Electronic Data Surveillance System (NC EDSS)

As can be seen from Figure 1, the total number of cases in North Carolina for 2009 is only 23 percent of the total number of cases in 1980 (that is 250 cases compared to 1066). On average, the numbers have declined by almost five percent per year. TB incidence in North Carolina decreased 24% between 2005 and 2009, down from 329 cases to 250 cases. The number of cases reported in North Carolina decreased from 335 to 250 between reporting years 2008 and 2009 – thus the total number of cases in 2009 was 25 percent lower than the total number of cases in 2008.

Both U.S. and N.C. TB Case Rates have dropped significantly since 1980. (See Figure 2.) Since 2003, the N.C. case rate has been lower than the U.S. case rate. Although the number of cases has declined in North Carolina in the past five years, the state is ranked as 26nd highest for case rates in 2009. North Carolina has the tenth highest number of cases among the fifty states. [See Table 1.]

Figure 2. TB Case Rates for N.C. and the U.S.: 1980 - 2009



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 2005-2009

| Year | Case Rate and Rank by Case Rate 2005-2009* | | |
|------|--|----------------|------|
| | Rates | | Rank |
| | USA | North Carolina | |
| 2005 | 4.8 | 3.8 | 25 |
| 2006 | 4.6 | 4.2 | 18 |
| 2007 | 4.4 | 3.8 | 22 |
| 2008 | 4.2 | 3.6 | 20 |
| 2009 | 3.8 | 2.7 | 26 |

DATA SOURCE: Annual surveillance reports published by CDC.

Figure 3 on the following page is a map of 2009 cases in N.C. by county of residence.

Figure 3. North Carolina 2009 Tuberculosis Cases

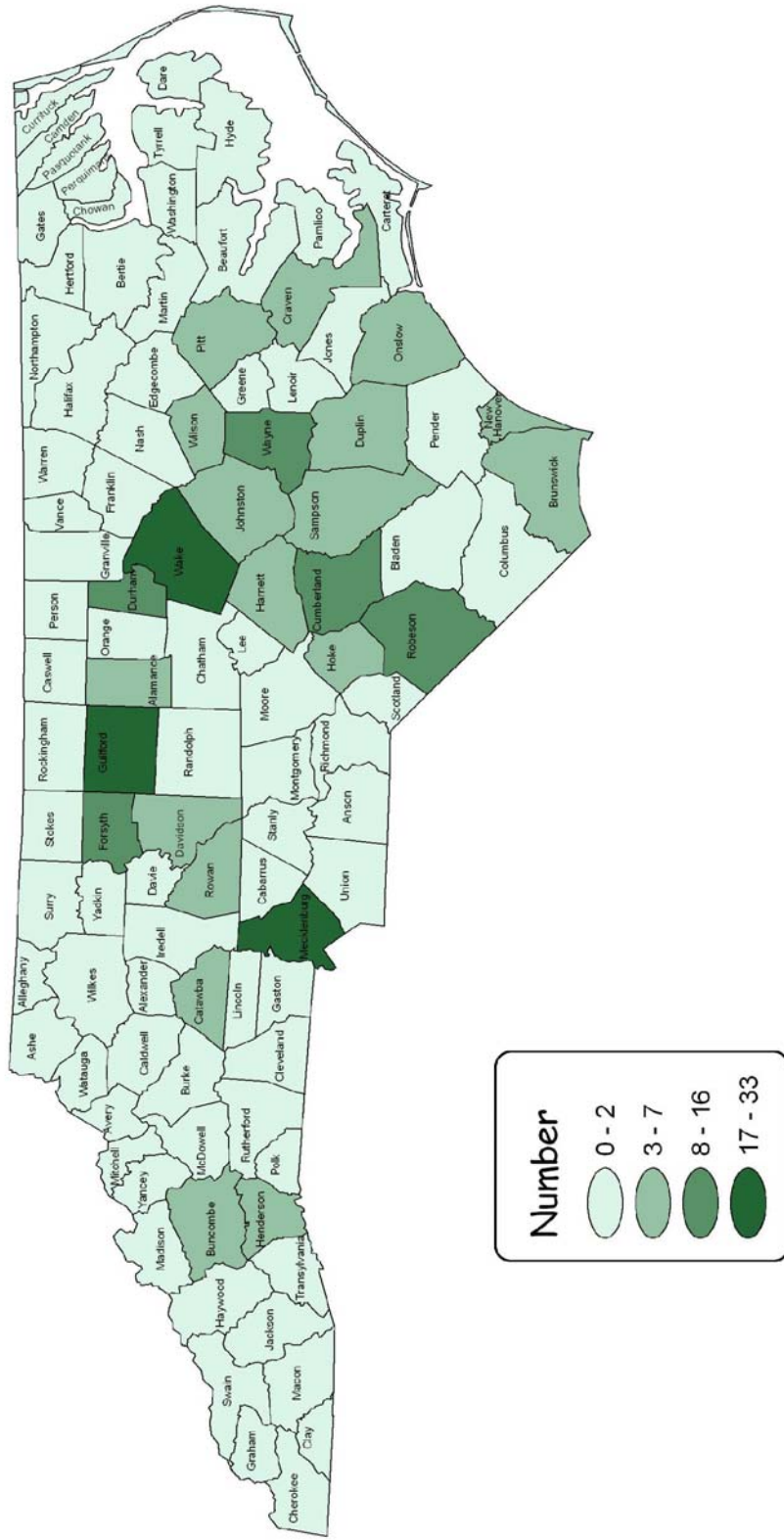


Table 1 provides a statistical overview and Table 2 provides a demographic overview of reported cases and case rates in N.C. from 2005 – 2009. Table 9 provides TB incidence and rates by county. Figures 4, 5, and 6 provide information about percent of cases by gender, age, and race/ethnicity. TB cases in N.C. decreased between 2005 and 2009 from 329 to 250 – a 24% decrease. There were 25 percent fewer cases in 2009 than in 2008. In 2009, the percentage of cases for all racial groups remained fairly consistent with the percentages for 2008. Numbers for all races decreased over the five years with the exception of Asians which only increased four percent (from 28 to 29 persons). There are also more persons reporting being multiracial in 2009 than in 2005. The decrease in cases was greatest for blacks (with 32.7% fewer cases in 2009 as compared with 2005). The number of cases decreased or remained the same for every age group with the exception of ages 5 – 24 with the greatest decrease being in ages ≥ 65 (40.0% decrease from 2005 to 2009).

North Carolina rates per 100,000 population decreased from 2005 to 2009 by 29%, (from 3.8 per 100,000 to 2.7 per 100,000). The incidence rate for Black/African-Americans decreased from 9.0 in 2005 to 5.3 by 2009, which is a 42 percent decrease. While rates for Asians have fluctuated over the five years, rates for Asians decreased from 19.1 in 2005 to 16.1 in 2009. Annual incidence rates among Hispanics decreased from 13.5 in 2005 to 7.8 in 2009. Rates for ages 65 and over decreased from 7.1 to 3.6, resulting in a 49 percent decrease. The rates for males decreased from 5.7 to 3.4, which is a 40 percent decrease. During the same time period, rates for females only decreased by 14 percent (from 2.2 to 1.9 per 100,000).

Table 2: N.C. TB Case Rates for 2005-2009

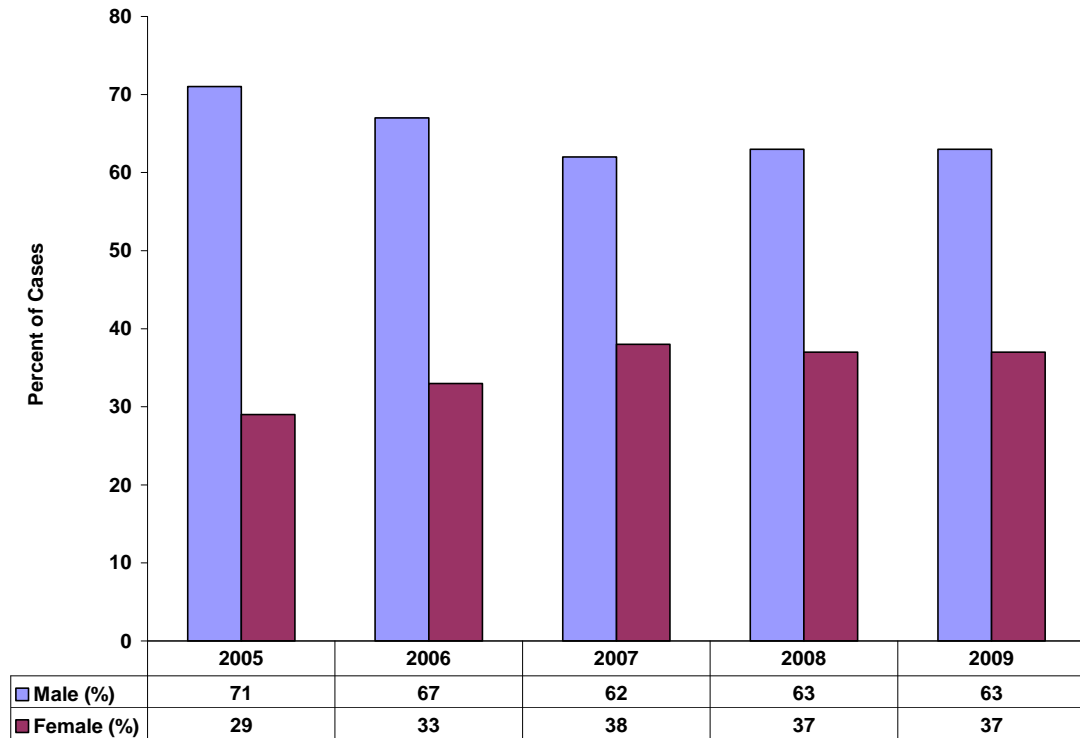
| Table 2 | NORTH CAROLINA TB CASE RATES FOR 2005-2009*† | | | | | | | | | |
|----------------------------|--|------|-----|------|-----|------|-----|------|-----|------|
| | Year | 2005 | | 2006 | | 2007 | | 2008 | | 2009 |
| VARIABLES | # | Rate | # | Rate | # | Rate | # | Rate | # | Rate |
| Cases | 329 | 3.8 | 374 | 4.2 | 345 | 3.8 | 335 | 3.6 | 250 | 2.7 |
| SEX | | | | | | | | | | |
| Male | 233 | 5.7 | 252 | 6.1 | 214 | 4.8 | 212 | 4.7 | 157 | 3.4 |
| Female | 96 | 2.2 | 122 | 2.8 | 131 | 2.8 | 123 | 2.6 | 93 | 1.9 |
| RACE | | | | | | | | | | |
| White‡ | 132 | 2.2 | 141 | 2.3 | 153 | 2.3 | 141 | 2.1 | 103 | 1.5 |
| Black/African-American | 159 | 9.0 | 166 | 9.4 | 131 | 6.6 | 129 | 6.4 | 107 | 5.3 |
| Asian | 28 | 19.1 | 57 | 38.8 | 53 | 31.0 | 43 | 24.6 | 29 | 16.1 |
| Amer. Indian/Alaska Native | 9 | 8.4 | 8 | 7.5 | 7 | 6.2 | 9 | 7.9 | 6 | 5.1 |
| Hawaiian/Other Pac. Isl. | 1 | 29.9 | 0 | 0 | 0 | 0.0 | 0 | 0 | 0 | 0 |
| Multi-Racial | 0 | 0 | 2 | 1.6 | 1 | 1.1 | 13 | 12.6 | 5 | 4.4 |
| ETHNICITY | | | | | | | | | | |
| Hispanic | 72 | 13.5 | 75 | 14.1 | 101 | 15.8 | 85 | 13.0 | 54 | 7.8 |
| Non-Hispanic | 257 | 3.3 | 299 | 3.8 | 244 | 2.9 | 250 | 2.9 | 196 | 2.2 |
| AGE | | | | | | | | | | |
| 0- 4 | 13 | 2.2 | 10 | 1.7 | 18 | 1.9 | 19 | 2.0 | 9 | 1.4 |
| 5-14 | 7 | 0.6 | 7 | 0.6 | 7 | 0.6 | 8 | 0.6 | 9 | 0.7 |
| 15-24 | 28 | 2.6 | 52 | 4.9 | 45 | 3.6 | 30 | 2.4 | 30 | 2.3 |
| 25-44 | 105 | 4.2 | 132 | 5.3 | 122 | 4.8 | 119 | 4.6 | 78 | 3.0 |
| 45-64 | 106 | 5.1 | 100 | 4.8 | 89 | 3.8 | 91 | 3.8 | 82 | 3.4 |
| >65 | 70 | 7.1 | 73 | 7.4 | 64 | 5.8 | 68 | 6.0 | 42 | 3.6 |

*Data source: NC EDSS TB Surveillance - Demographic Data Report. Rates are per 100,000.

‡Includes White Hispanic and White Non-Hispanic.

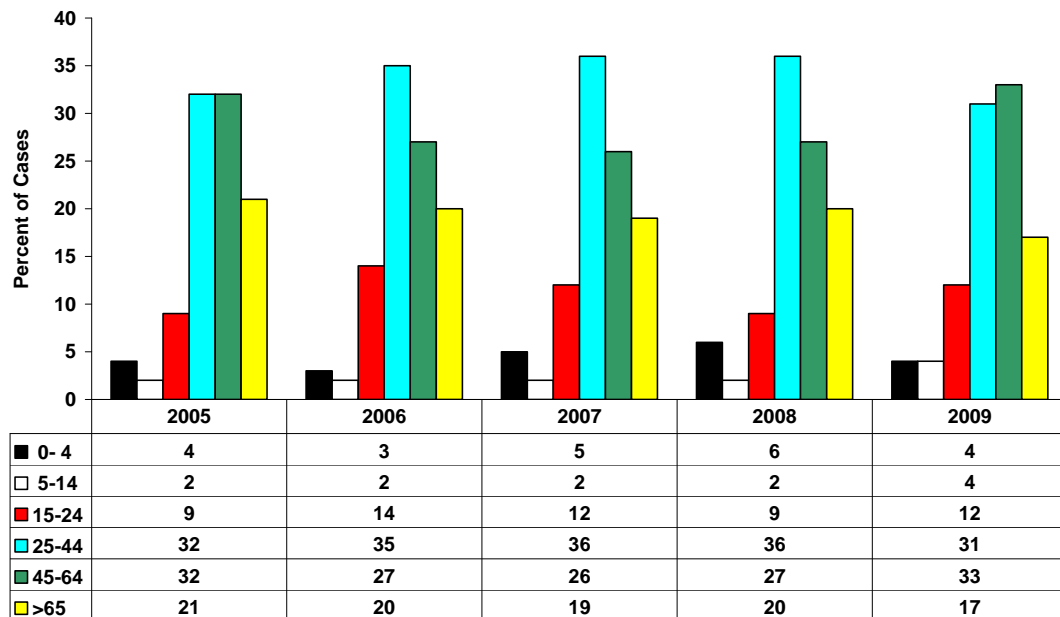
†Denominators for computing rates for the state were obtained from the Annual Estimates of the Population for the United States and Puerto Rico. Source: U.S. Census Bureau, American Community Survey. 2009 Rates were calculated based on the 2008 population estimates with the strata inflated to reflect the 1.07% increase of the total NC population from 2008 to 2009. 2008 rates were updated to be calculated on the actual 2008 Annual Estimates for North Carolina.

Figure 3. N.C. TB Cases by Gender: 2005 – 2009



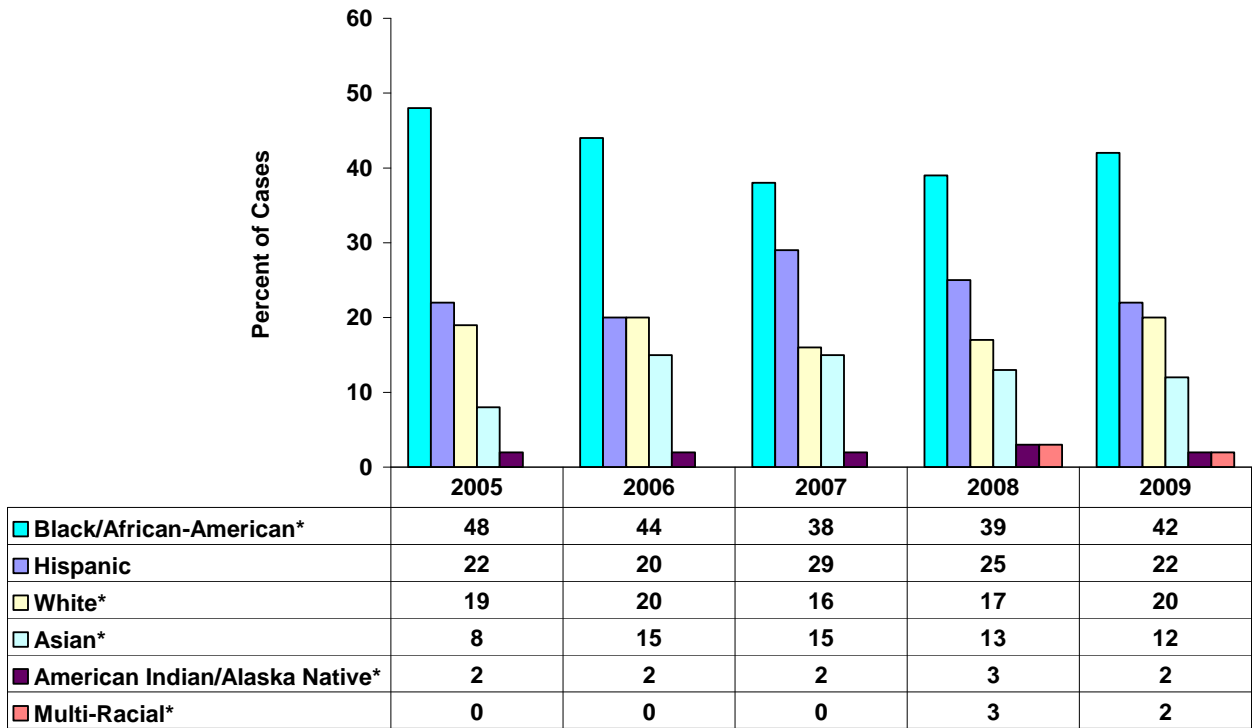
DATA SOURCE: North Carolina Electronic Disease Surveillance System (NC EDSS)

Figure 4. N.C. TB Cases by Age Group: 2005 – 2009



DATA SOURCE: North Carolina Electronic Disease Surveillance System (NC EDSS)

Figure 5. N.C. TB Cases by Race and Ethnicity: 2005 – 2009



* Does not include Hispanics

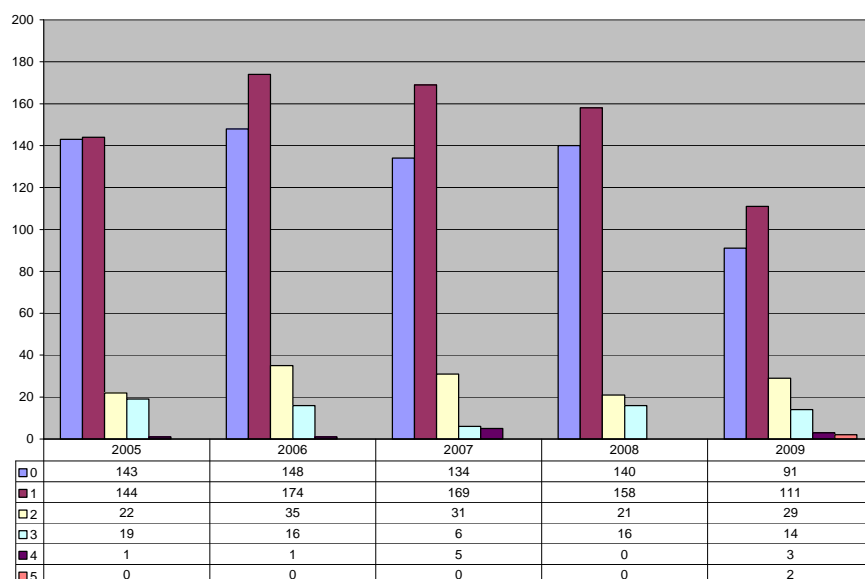
DATA SOURCE: North Carolina Electronic Disease Surveillance System (NC EDSS)

RISK FACTORS

RISK FACTORS FOR TB

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 7, most people have at least one risk factor. In 2009, approximately 19 percent of the cases have two or more risk factors.

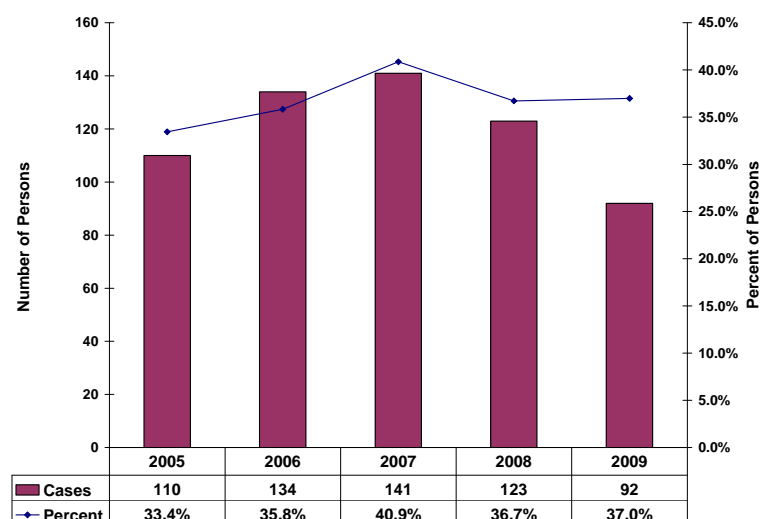
Figure 6. N.C. TB Cases by Number of Risk Factors: 2005 – 2009



DATA SOURCE: North Carolina Electronic Disease Surveillance System (NC EDSS)

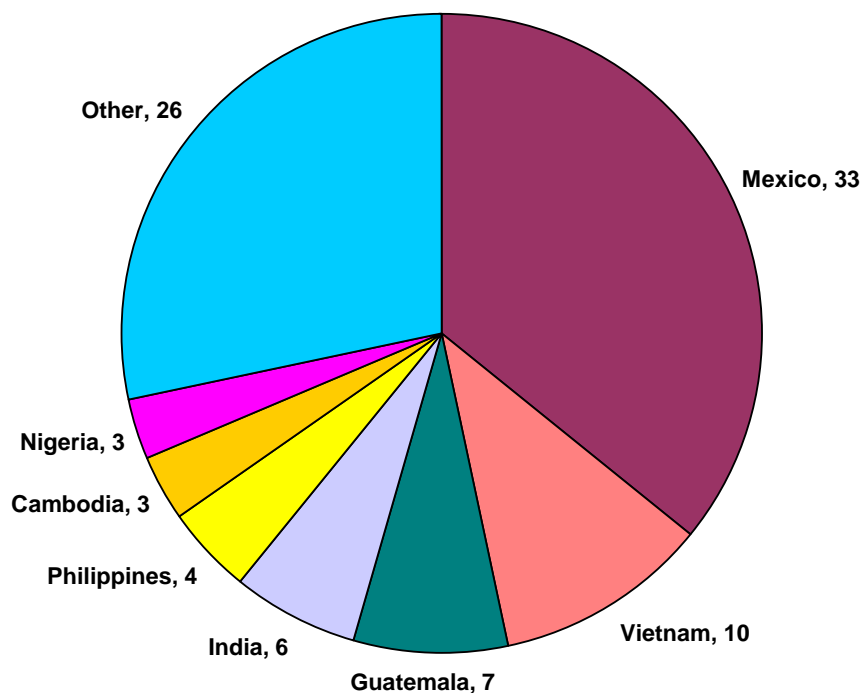
Foreign Born: The number of foreign-born cases in 2009 was a 25.3 percent lower than the number in 2008 (123 cases in 2008 and 92 in 2009). [See Figure 9.] N.C. has a lower percentage of foreign-born in comparison to the U.S. average. The largest percentage of foreign-born cases in 2009 were from Mexico (36%), Vietnam (11%), Guatemala (8%), and India (6%). [See Figure 9.]

Figure 7. N.C. Foreign-Born TB Cases: 2005 – 2009



DATA SOURCE: North Carolina Electronic Disease Surveillance System (NC EDSS)

Figure 8. Countries of Origin for 2009 Foreign-born TB Cases in N.C.*



DATA SOURCE: North Carolina Electronic Disease Surveillance System (NC EDSS)

Pediatric Cases by Foreign-Born Status: An examination of 2009 pediatric cases by country of origin indicates that 11 percent are foreign born. This is a decrease from the percentage for 2008.

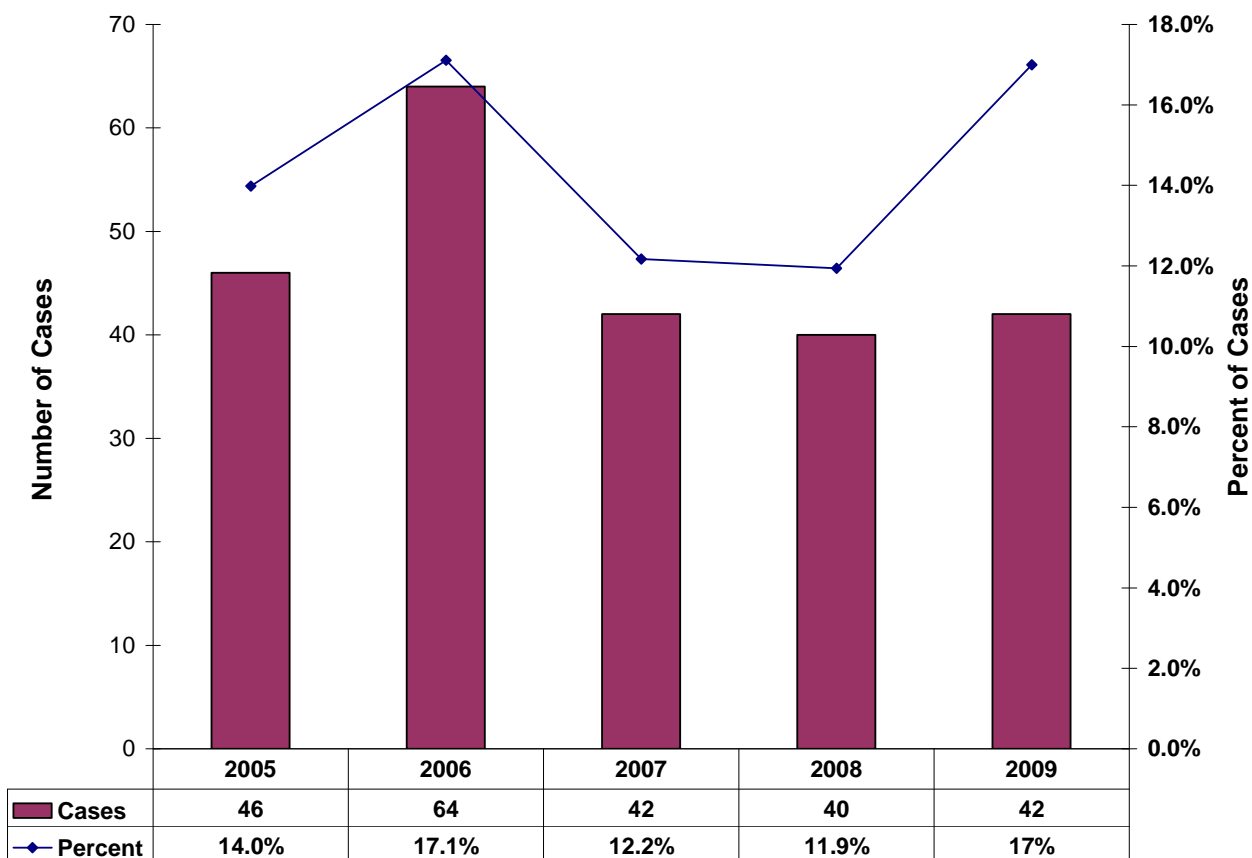
Table 3: Pediatric Cases by Foreign-Born Status

| Table 3 | 2008 | | 2009 | |
|--------------|-----------|-----------|-----------|--------------|
| | U.S. BORN | U.S. BORN | U.S. BORN | FOREIGN BORN |
| 0 – 4 YEARS | 16 | 16 | 9 | 0 |
| 5 – 14 YEARS | 3 | 3 | 7 | 2 |
| TOTAL | 19 | 19 | 16 | 2 |

DATA SOURCE: North Carolina Electronic Disease Surveillance System (NC EDSS)

Excessive Alcohol Use: The number of TB cases with reported excessive alcohol use between 2007 and 2009 has remained fairly constant. [See Figure 10.] In 2009, 81 percent of this group were U.S. born (or children of US citizens), 7 percent were foreign-born Hispanics, and 12 percent were foreign-born non-Hispanics. 2009 is the only year in this time period where there are persons who were foreign-born non-Hispanics. [See Table 4.]

Figure 9. N.C. TB Cases With Excess Alcohol Use: 2005 - 2009



DATA SOURCE: North Carolina Electronic Disease Surveillance System (NC EDSS)

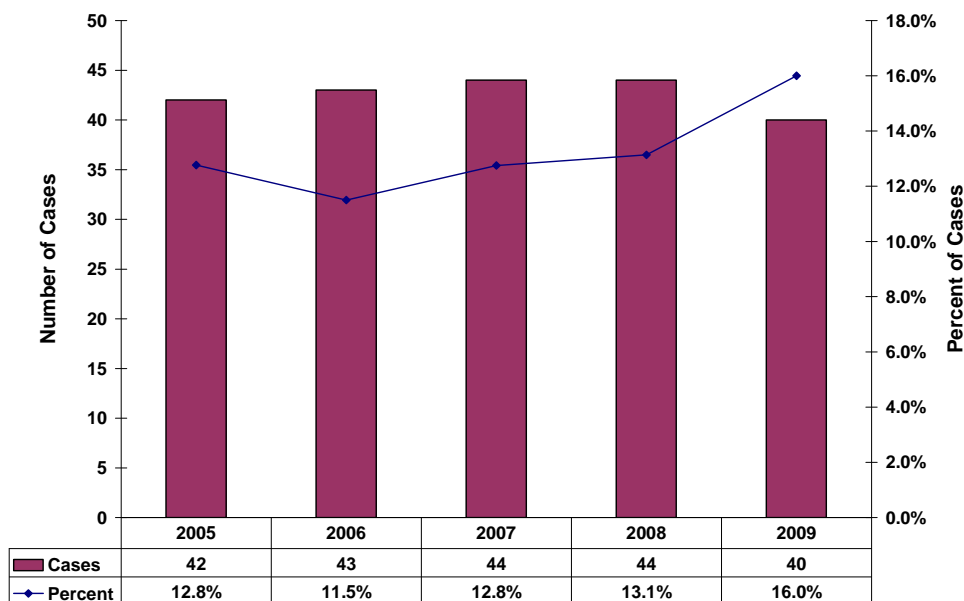
Table 4: Alcohol Use by Ethnicity and Foreign Born Status 2005-2009

| Year | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | |
|-------------------|--------------|---------|--------------|---------|--------------|---------|--------------|---------|--------------|---------|
| | Foreign Born | US Born | Foreign Born | US Born | Foreign Born | US Born | Foreign Born | US Born | Foreign Born | US Born |
| Hispanic | 4 | 0 | 7 | 2 | 4 | 0 | 7 | 2 | 3 | 2 |
| Not Hispanic | 0 | 42 | 0 | 54 | 0 | 42 | 0 | 54 | 5 | 32 |
| Ethnicity Unknown | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| TOTAL | 46 | | 64 | | 42 | | 40 | | 42 | |

DATA SOURCE: North Carolina Electronic Disease Surveillance System (NC EDSS)

Non-Injecting Drug Use: Non-injecting drug use has been reported for approximately 12 – 14 percent of N.C. TB patients for several years. That percentage rose to 16 in 2009. [See Figure 11.]

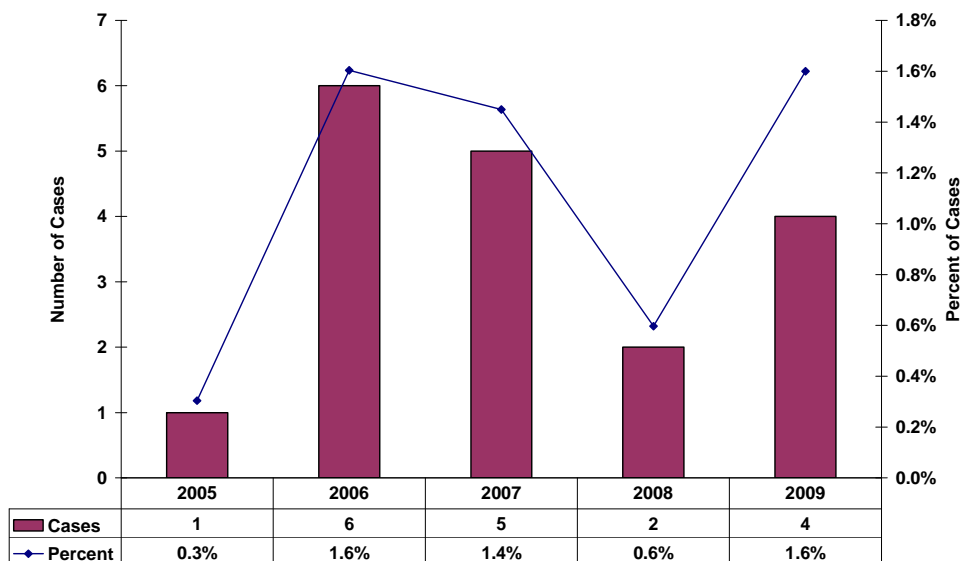
Figure 10. N.C. TB Cases with Known Non-Injecting Drug Use: 2005 – 2009



DATA SOURCE: North Carolina Electronic Disease Surveillance System (NC EDSS)

Injecting Drug Use: IDU is not a significant problem for our TB cases in N.C. It has been reported in only 0 – 2% of our TB cases during any reporting year. [See Figure 12.]

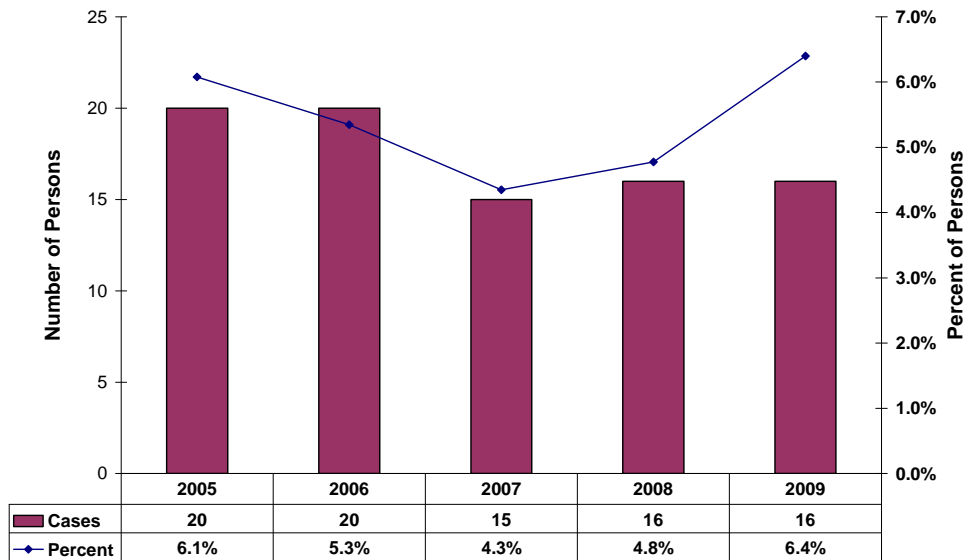
Figure 11. N.C. TB Cases with Known Injecting Drug Use: 2005 – 2009



DATA SOURCE: North Carolina Electronic Disease Surveillance System (NC EDSS)

Homeless: The number of reported homeless TB cases remained the same from 2008 to 2009 although the percentage of total cases is higher. [See Figure 13.]

Figure 12. N.C. TB Cases Homeless in Year Prior to Diagnosis: 2005 - 2009



DATA SOURCE: North Carolina Electronic Disease Surveillance System (NC EDSS)

Long Term Care Facilities: The number of TB cases diagnosed in Long Term Care Facilities from 2006 to 2009 remained fairly constant. [See Figure 14.]

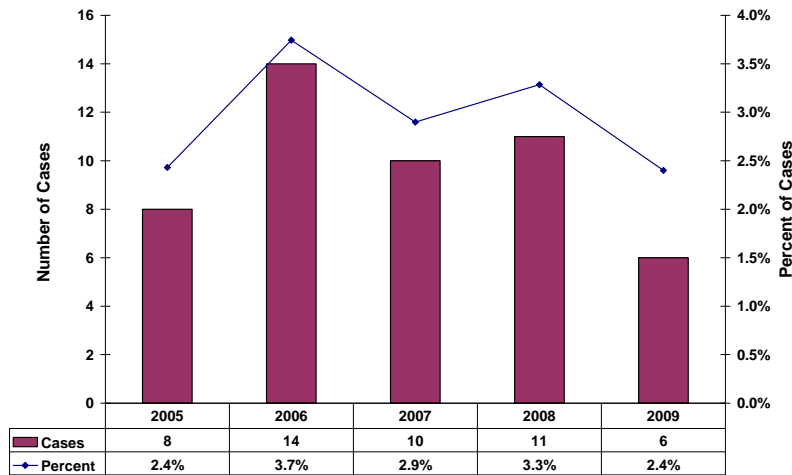
Figure 13. N.C. TB Cases That Were Residents of a Long-Term Care Facility at Time of Diagnosis: 2005 – 2009



DATA SOURCE: North Carolina Electronic Disease Surveillance System (NC EDSS)

Correctional Facilities: The case rate for the State Prison population was 2.5 per 100,000 for the year 2009. (The 2009 N.C. Department of Correction average daily inmate population was 40,133.) Figure 15 is a graph of all total persons diagnosed in a correctional facility (state prison, local jail, or federal facility). [See Figure 15.]

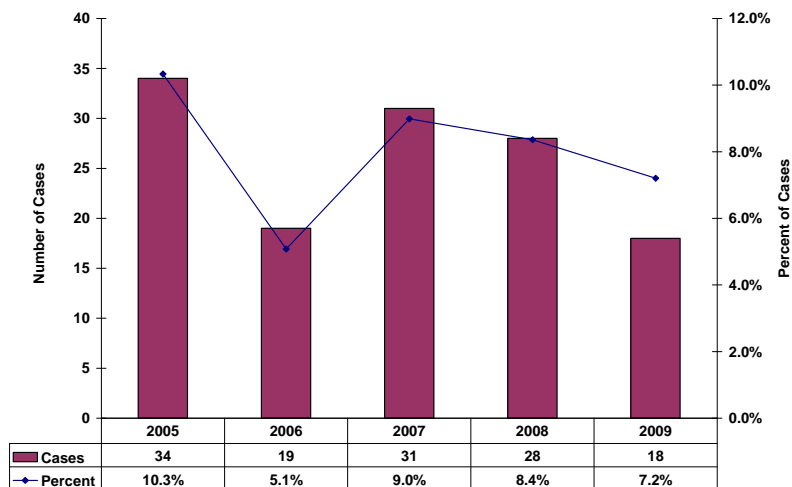
Figure 14. N.C. TB Cases Residing in Correctional Facility at Time of Diagnosis: 2005 - 2009



DATA SOURCE: North Carolina Electronic Disease Surveillance System (NC EDSS); N.C. Department of Correction and DHHS Division of Facility Services, Jails and Detention January 2009 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 16 shows the number and percentage of cases that had HIV infection. Table 5 presents the distribution of HIV and TB co-morbidity by age. In 2009, all co-infected cases were between the ages of 25 and 64.

Figure 15. N.C. TB Cases with HIV Infection: 2005 – 2009



DATA SOURCE: North Carolina Electronic Disease Surveillance System (NC EDSS)

Table 5: TB Cases with HIV Infection by Age Group 2005 - 2009

| Table 5 | TB Cases with HIV Infection by Age Group 2005 - 2009* | | | | |
|------------------|--|-------------|-------------|-------------|-------------|
| Age Group | 2005 | 2006 | 2007 | 2008 | 2009 |
| 0-4 | 0 | 0 | 0 | 0 | 0 |
| 5-14 | 0 | 0 | 0 | 1 | 0 |
| 15-24 | 0 | 1 | 1 | 2 | 0 |
| 25-44 | 21 | 14 | 14 | 17 | 8 |
| 45-64 | 13 | 2 | 15 | 7 | 10 |
| ≥65 | 0 | 2 | 1 | 1 | 0 |

DATA SOURCE: North Carolina Electronic Disease Surveillance System (NC EDSS)

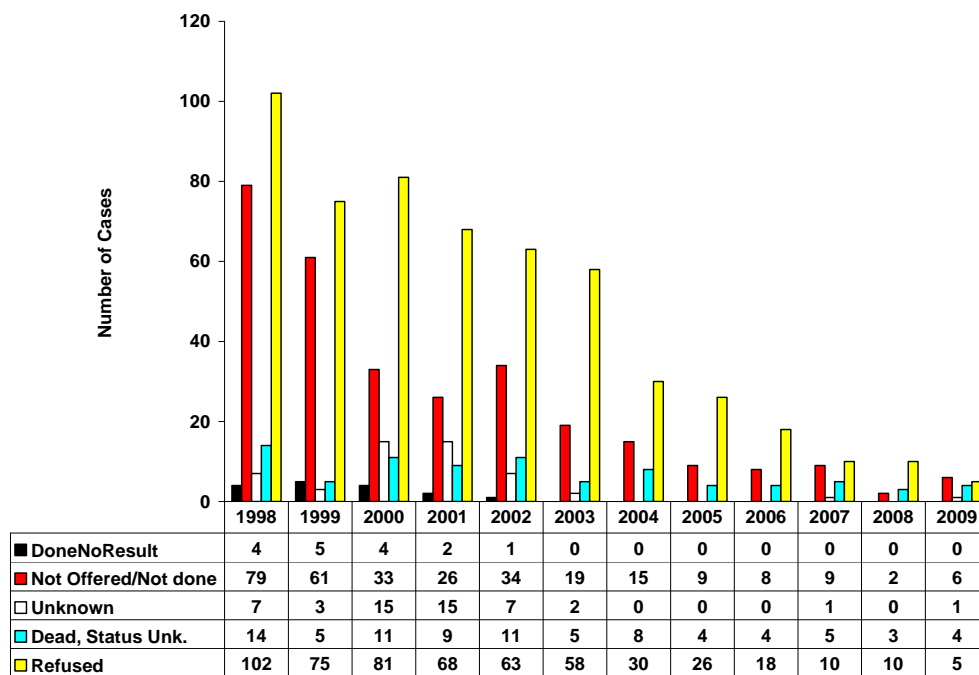
Table 6 and Figure 17 show the progress that has been made in North Carolina with respect to standard of care and HIV status—namely, very few cases are not offered HIV testing, and an increasing number of TB cases are accepting the offered HIV test. Since November of 2007, the standard of care has been to offer HIV testing as part of routine screening. Patients are informed that HIV testing is part of the screening and may decide to “opt-out” of that test. Before this went into effect, NC TB nurse consultants had spent a lot of time training in local health departments to encourage HIV testing. Consequently, the number of cases where HIV status is unknown has decreased greatly over the past 10 years. Fewer patients refuse testing (down from 20.5% in 1998 to 2% in 2009) and there are fewer patients who are not being offered testing (down from 15.9% in 1998 to 2.4% in 2009).

Table 6: Reported HIV Results 2005 – 2009

| Table 6 | Reported HIV Results 2005 – 2009* | | | | |
|--------------------------------|--|-------------|-------------|-------------|-------------|
| Status | 2005 | 2006 | 2007 | 2008 | 2009 |
| Negative | 254 | 324 | 289 | 290 | 217 |
| Positive | 34 | 19 | 31 | 28 | 18 |
| Refused | 26 | 17 | 10 | 11 | 5 |
| Not Offered | 9 | 8 | 10 | 3 | 6 |
| Tested No Result | 2 | 1 | 0 | 0 | 0 |
| Unknown | 0 | 1 | 0 | 0 | 1 |
| Dead and Status Unknown | 4 | 4 | 5 | 3 | 4 |
| Missing | 0 | 0 | 0 | 0 | 0 |

DATA SOURCE: North Carolina Electronic Disease Surveillance System (NC EDSS)

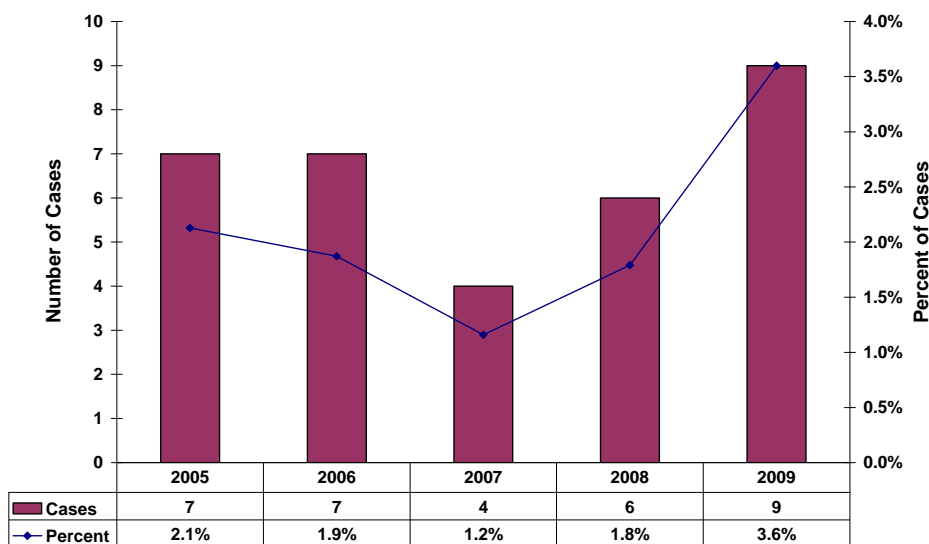
Figure 16: N.C. TB Cases With Unknown HIV Status: 1998 - 2009



DATA SOURCE: North Carolina Electronic Disease Surveillance System (NC EDSS)

Occupation: The occurrence of TB in persons identified as healthcare workers remains an area that receives close scrutiny and intensive investigation. Figure 18 does NOT indicate TB exposure in health care settings, but rather provides an indication of cases among those who could expose others, or be exposed to, TB. The percent of cases was higher for 2009.

Figure 17. N.C. Health Care Workers with TB Disease: 2005 - 2009



DATA SOURCE: North Carolina Electronic Disease Surveillance System (NC EDSS)

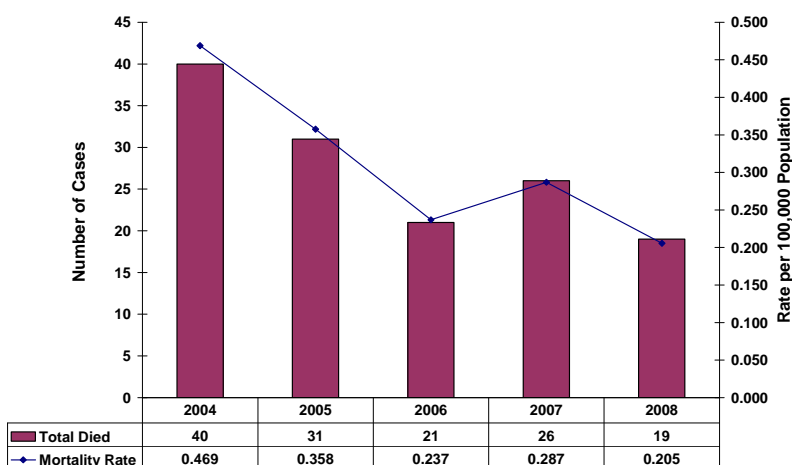
CLINICAL DATA

CLINICAL DATA FOR N.C.

Mortality of TB Cases in N.C.

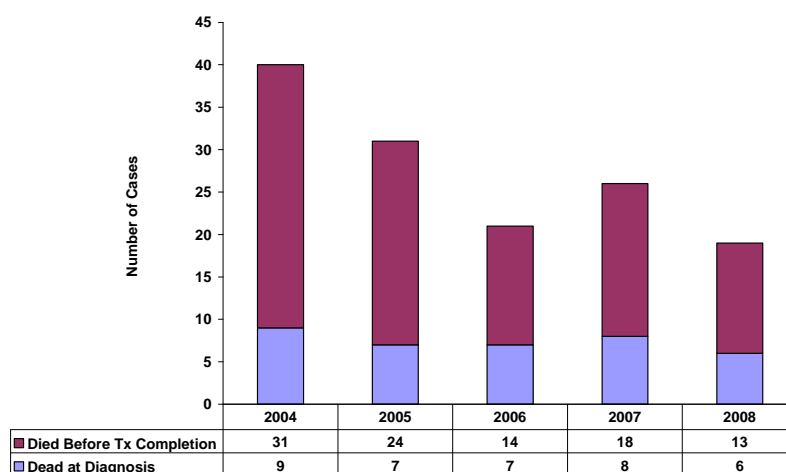
As can be seen from Figures 19 and 20, mortality of TB cases from diagnosis to treatment completion has decreased over the past 5 years. In 2004, there were 40 deaths (nine dead at diagnosis and 31 who died before completion of treatment); by 2008, there were 19 deaths (six dead at diagnosis and 13 who 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 18. N.C. TB Case Mortality and Rates: 2004 – 2008



DATA SOURCE: North Carolina Electronic Disease Surveillance System (NC EDSS)

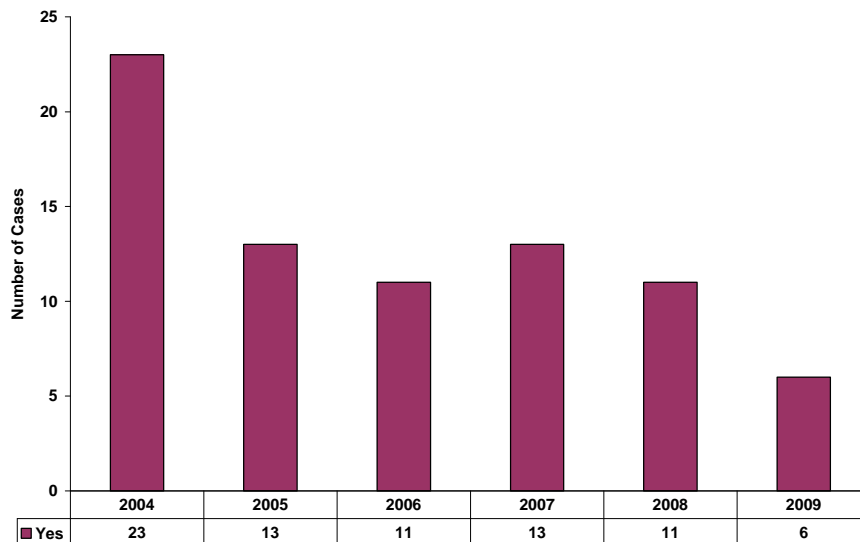
Figure 19. Timing of Death Among TB Cases in N.C.: 2004 – 2008



DATA SOURCE: North Carolina Electronic Disease Surveillance System (NC EDSS)

Previous Diagnosis of TB: Only six TB patients in 2009 had a previous diagnosis of TB. However, there was one patient for whom this data was not available (this person was thought to have moved to New Jersey before the information was gathered). The number is down from 23 cases in 2004 that had a previous diagnosis of TB. Again, this may be related to greater assurance of completion of therapy with directly observed therapy.

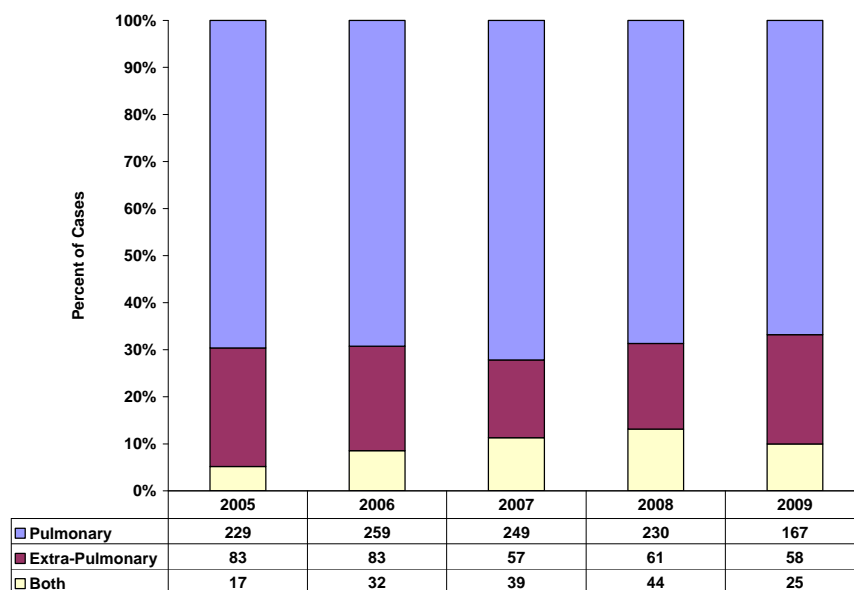
Figure 20. Previous Diagnosis of TB for TB Patients in N.C.: 2004 - 2009



DATA SOURCE: North Carolina Electronic Disease Surveillance System (NC EDSS)

Site of TB Disease: Figure 22 shows the number and percentage of Pulmonary, Extra-pulmonary and combinations of both Pulmonary and Extra-pulmonary sites of TB Disease for years 2005 – 2009. There was been no significant change from the numbers and percentages reported for years 2008 and 2009. Table 7 provides a more detailed breakout for the major disease sites.

Figure 21. Major Site of Disease for TB Patients in N.C.: 2005 -2009



DATA SOURCE: North Carolina Electronic Disease Surveillance System (NC EDSS)

Table 7. Major Site of Disease for N.C. TB Patients: 2005 - 2009

| Site | 2005 | 2006 | 2007 | 2008 | 2009 |
|--------------------------|------|------|------|------|------|
| Bone/Joint | 16 | 10 | 7 | 13 | 5 |
| Genitourinary | 8 | 4 | 2 | 2 | 5 |
| Lymphatic: Cervical | 15 | 18 | 10 | 15 | 16 |
| Lymphatic: Intrathoracic | 5 | 4 | 4 | 2 | 0 |
| Lymphatic: Other | 1 | 8 | 5 | 7 | 3 |
| Meningeal | 5 | 4 | 5 | 5 | 2 |
| Miliary | 13 | 13 | 17 | 11 | 3 |
| Other | 6 | 7 | 4 | 11 | 7 |
| Peritoneal | 2 | 4 | 1 | 1 | 4 |
| Pleural | 14 | 25 | 19 | 13 | 16 |
| Pulmonary | 244 | 277 | 271 | 255 | 189 |

DATA SOURCE: North Carolina Electronic Disease Surveillance System (NC EDSS)

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 2009, all 249 culture-proven cases of TB had drug susceptibility reports available. Drug resistance to INH in North Carolina decreased from 12 cases (4%) in 2005 to 12 cases (6%) in 2009. Between 2005 and 2009 the number of MDR cases has ranged from 1 to 3 cases per year. In 2008, there were 86 cases (1.0%) in the U.S. The U.S. and N.C. have similar case percentages for both INH and MDR resistance although NC percentages are generally lower.

Table 8. First-Line Primary TB Drug Resistance in N.C. Patients: 2005-2009

| Table 8 Year | First-Line Primary TB Drug Resistance Over Time 2005-2009* | | | | | | | | | |
|------------------------------|--|---|------|---|------|---|------|---|------|---|
| | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | |
| | # | % | # | % | # | % | # | % | # | % |
| INH ¹ | 12 | 4 | 16 | 5 | 7 | 2 | 13 | 5 | 12 | 6 |
| MDR (INH & RIF) ³ | 3 | 1 | 1 | 0 | 2 | 1 | 2 | 1 | 1 | 0 |
| **Total Positive Cultures | 271 | | 302 | | 274 | | 249 | | 197 | |

DATA SOURCE: CaroTIMS.

**Total positive cultures with susceptibility results known.

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

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

A closer look at the drug resistance by foreign-born status reveals that there are differences in the two groups. While over the period 2005-2009 the percentage of foreign-born persons with drug resistance is higher overall than for US citizens (15.4% v. 9.9%), the difference in rates of MDR is even greater, over three-fold higher in foreign born cases as compared with US born persons or children born to US citizens (1.3 v. 0.4).

Table 9. Comparison of Drug Resistance in US and Foreign Born Patients: 2005 – 2009 (Years Combined)

| Table 8a | Drug Resistance by US and Foreign-born – 2005 – 2009 (years combined) | | | |
|------------------------------|---|------|-----|------|
| | Foreign born | | US | |
| | # | % | # | % |
| INH ¹ | 28 | 6.1 | 31 | 3.7 |
| INH & SM ² | 12 | 2.6 | 9 | 1.1 |
| MDR (INH & RIF) ³ | 6 | 1.3 | 3 | 0.4 |
| Any Other Drug Resistance | 25 | 5.4 | 339 | 4.7 |
| Total Drug Resistance | 71 | 15.4 | 82 | 9.9 |
| No Drug Resistance | 389 | 84.6 | 745 | 90.1 |

*Data source: CaroTIMS.

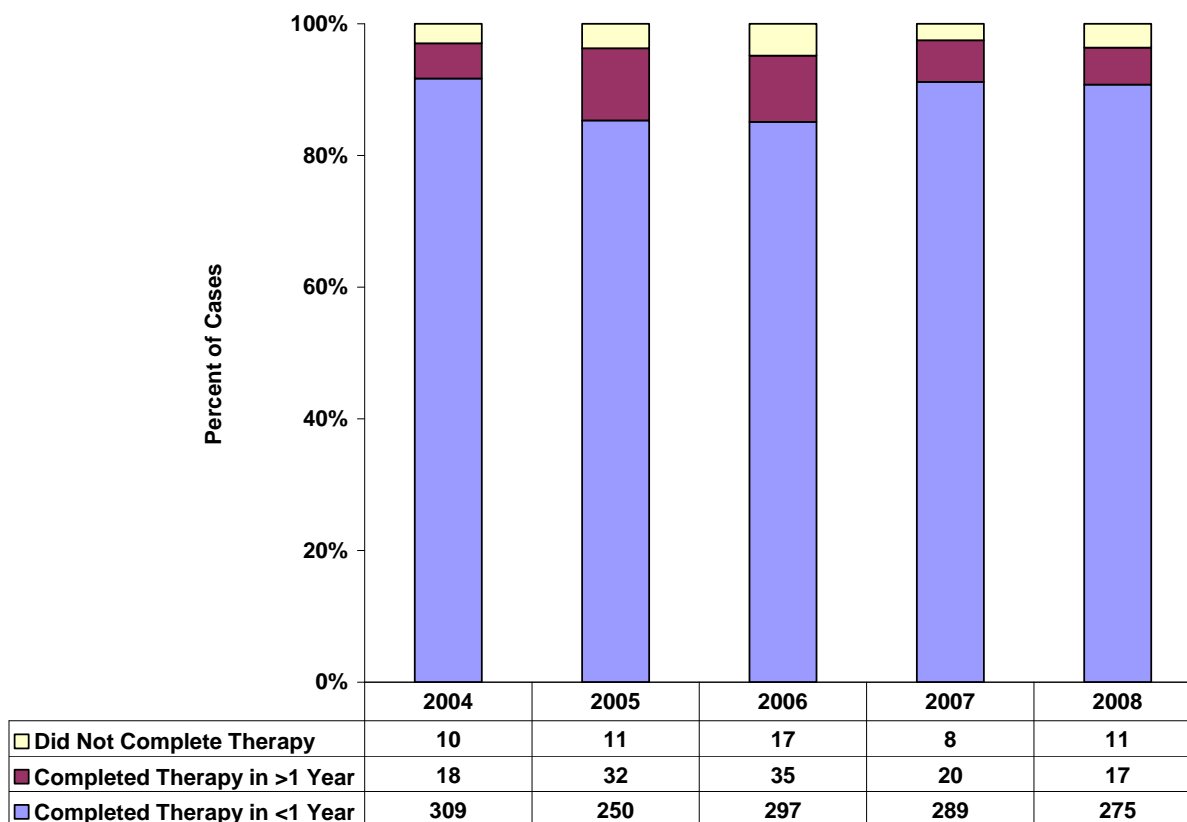
¹Includes INH and any other drugs except SM or RIF. Resistance may have been found at either initial or final testing.

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 and 92 percent between 2002 and 2004; however, in 2005 AND 2006, there was a drop to 86 percent. In 2006, N.C. passed legislation requiring all TB cases be placed on DOT. This should increase the percentage of cases completing therapy within one year. Although some of our cases are not total DOT, they were on DOT for more than 26 weeks and would be considered to meet the criteria for having total DOT. If the numbers on DOT plus the numbers on DOT 26 weeks or more are added together and divided by the total cases (minus any that were dead at diagnosis, died before completion of 26 weeks of DOT treatment, or that are currently on treatment), the percentage on DOT went from 96.8 percent in 2005 to 99.0 percent in 2008. The percentage of 2008 cases that completed therapy in one year was 90.8 percent with another 5.6 percent completing after one year. In 2008, for cases taking longer than 12 months to complete, one or more of the following reasons were provided: bone or joint disease (7); non-adherent, doses added to regimen (5); treatment deviation (5); culture conversion after 2 months (3); cavitary disease (2); “other” hepatotoxicity issues (2); lost to follow-up (2); miliary (2); ”Other” intolerance (1); slow response (1); RIF or Rifabutin not tolerated (1); PZA caused hepatotoxicity (1); and PZA not tolerated other than hepatotoxicity (1). Only 3.6 percent have not completed treatment – five are lost to follow-up, two moved to Mexico(CURE TB), one moved out of state, and two are still on therapy (one left country and returned but did not tolerate Rifampin/Rifabutin and one had slow response).

Figure 22. Patients Completing Therapy in N.C.: 2004 – 2008



DATA SOURCE: North Carolina Electronic Disease Surveillance System (NC EDSS)

This includes all patients alive at diagnosis and who did not die during treatment. Patients with any rifampin-resistant TB or meningeal TB, and children aged 14 or younger with disseminated TB are excluded.

SUPPLEMENTAL TABLES

Table 10: TB Cases and Case Rates by County 2005-2009*

| NC COUNTY TB CASES AND CASE RATES 2005-2009* | | | | | | | | | | |
|---|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|
| | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | |
| COUNTY | CASES | RATE | CASES | RATE | CASES | RATE | CASES | RATE | CASES | RATE |
| Alamance | 3 | 2.2 | 3 | 2.3 | 3 | 2.1 | 4 | 2.7 | 5 | 3.4 |
| Alexander | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Alleghany | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Anson | 1 | 3.9 | 1 | 3.9 | 2 | 7.7 | 3 | 11.6 | 0 | 0 |
| Ashe | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Avery | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Beaufort | 3 | 6.5 | 6 | 13.3 | 2 | 4.2 | 2 | 4.3 | 0 | 0 |
| Bertie | 0 | 0 | 0 | 0 | 3 | 15.4 | 0 | 0 | 0 | 0 |
| Bladen | 3 | 9.1 | 1 | 3.1 | 0 | 0 | 1 | 3 | 1 | 3 |
| Brunswick | 2 | 2.2 | 1 | 1.4 | 2 | 2.1 | 3 | 3 | 5 | 4.9 |
| Buncombe | 4 | 1.8 | 2 | 1 | 13 | 5.7 | 7 | 3 | 6 | 2.6 |
| Burke | 4 | 4.5 | 2 | 2.2 | 0 | 0 | 0 | 0 | 2 | 2.2 |
| Cabarrus | 3 | 2 | 4 | 3 | 1 | 0.6 | 4 | 2.4 | 1 | 0.6 |
| Caldwell | 2 | 2.5 | 1 | 1.3 | 6 | 7.3 | 2 | 2.5 | 2 | 2.4 |
| Camden | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Carteret | 0 | 0 | 2 | 3.4 | 1 | 1.5 | 3 | 4.6 | 1 | 1.5 |
| Caswell | 0 | 0 | 0 | 0 | 2 | 8.3 | 1 | 4.2 | 1 | 4.1 |
| Catawba | 3 | 2 | 1 | 0.7 | 4 | 2.5 | 1 | 0.6 | 4 | 2.5 |
| Chatham | 3 | 5.3 | 2 | 4 | 0 | 0 | 2 | 3.3 | 2 | 3.3 |
| Cherokee | 0 | 0 | 1 | 4.1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Chowan | 1 | 6.9 | 2 | 14.1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Clay | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cleveland | 2 | 2.1 | 4 | 4.1 | 3 | 3 | 1 | 1 | 1 | 1 |
| Columbus | 5 | 9.2 | 2 | 3.7 | 5 | 8.9 | 0 | 0 | 2 | 3.6 |
| Craven | 0 | 0 | 1 | 1.1 | 6 | 6.2 | 4 | 4.1 | 5 | 5 |
| Cumberland | 6 | 2 | 9 | 3 | 7 | 2.3 | 8 | 2.5 | 9 | 2.8 |
| Currituck | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dare | 4 | 11.5 | 0 | 0 | 1 | 2.9 | 0 | 0 | 1 | 2.8 |
| Davidson | 3 | 1.9 | 6 | 4.1 | 8 | 5 | 3 | 1.9 | 3 | 1.9 |
| Davie | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Duplin | 6 | 11.6 | 5 | 10.2 | 6 | 11.1 | 4 | 7.4 | 4 | 7.3 |
| Durham | 21 | 8.7 | 12 | 5.3 | 8 | 3.2 | 15 | 5.8 | 12 | 4.6 |
| Edgecombe | 3 | 5.7 | 4 | 7.2 | 3 | 5.4 | 6 | 11.4 | 2 | 3.7 |
| Forsyth | 13 | 4 | 14 | 4.6 | 11 | 3.2 | 16 | 4.6 | 8 | 2.3 |
| Franklin | 2 | 3.7 | 0 | 0 | 2 | 3.5 | 0 | 0 | 1 | 1.7 |
| Gaston | 1 | 0.5 | 2 | 1 | 4 | 2 | 4 | 2 | 1 | 0.5 |
| Gates | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Graham | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 12 | 0 | 0 |
| Granville | 1 | 1.9 | 1 | 2 | 1 | 1.8 | 1 | 1.8 | 0 | 0 |
| Greene | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 18.6 | 2 | 9.2 |

| NC COUNTY TB CASES AND CASE RATES 2005-2009* | | | | | | | | | | |
|--|-------|------|-------|------|-------|------|-------|------|-------|------|
| | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | |
| COUNTY | CASES | RATE | CASES | RATE | CASES | RATE | CASES | RATE | CASES | RATE |
| Guilford | 32 | 7.2 | 38 | 9 | 27 | 5.8 | 21 | 4.5 | 21 | 4.4 |
| Halifax | 2 | 3.6 | 5 | 8.7 | 3 | 5.3 | 4 | 7.1 | 2 | 3.5 |
| Harnett | 3 | 3 | 4 | 4.4 | 3 | 2.8 | 4 | 3.7 | 3 | 2.7 |
| Haywood | 0 | 0 | 1 | 1.8 | 2 | 3.5 | 0 | 0 | 1 | 1.7 |
| Henderson | 2 | 2 | 2 | 2.2 | 0 | 0 | 4 | 3.8 | 3 | 2.8 |
| Hertford | 1 | 4.2 | 2 | 8.7 | 1 | 4.1 | 1 | 4.1 | 1 | 4.1 |
| Hoke | 5 | 12.3 | 4 | 11.8 | 1 | 2.3 | 2 | 4.6 | 3 | 6.8 |
| Hyde | 0 | 0 | 1 | 17.1 | 0 | 0 | 1 | 18 | 1 | 17.7 |
| Iredell | 2 | 1.4 | 2 | 1.6 | 3 | 2 | 2 | 1.3 | 1 | 0.6 |
| Jackson | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 5.3 |
| Johnston | 4 | 2.7 | 4 | 3.2 | 8 | 5.1 | 10 | 6.2 | 7 | 4.3 |
| Jones | 0 | 0 | 1 | 9.6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lee | 1 | 1.9 | 1 | 2 | 3 | 5.2 | 0 | 0 | 1 | 1.7 |
| Lenoir | 3 | 5.1 | 7 | 11.8 | 4 | 6.8 | 4 | 6.8 | 2 | 3.4 |
| Lincoln | 0 | 0 | 1 | 1.6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Macon | 1 | 3.1 | 0 | 0 | 0 | 0 | 1 | 2.9 | 1 | 2.9 |
| Madison | 1 | 4.9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Martin | 1 | 4.1 | 2 | 7.8 | 1 | 4.8 | 2 | 8.2 | 1 | 4 |
| McDowell | 1 | 2.3 | 0 | 0 | 0 | 0 | 1 | 2.2 | 0 | 0 |
| Mecklenburg | 48 | 6 | 55 | 7.9 | 34 | 4 | 44 | 5 | 33 | 3.7 |
| Mitchell | 0 | 0 | 0 | 0 | 1 | 6.2 | 0 | 0 | 0 | 0 |
| Montgomery | 11 | 40.2 | 16 | 59.6 | 4 | 14.1 | 3 | 10.7 | 1 | 3.5 |
| Moore | 3 | 3.7 | 1 | 1.3 | 1 | 1.2 | 0 | 0 | 2 | 2.3 |
| Nash | 7 | 7.6 | 6 | 6.9 | 4 | 4.2 | 3 | 3.2 | 0 | 0 |
| New Hanover | 5 | 2.8 | 10 | 6.2 | 6 | 3.2 | 4 | 2.1 | 3 | 1.5 |
| Northampton | 2 | 9.3 | 1 | 4.5 | 2 | 9.2 | 1 | 4.6 | 0 | 0 |
| Onslow | 0 | 0 | 3 | 2 | 3 | 1.9 | 3 | 1.7 | 4 | 2.3 |
| Orange | 1 | 0.8 | 2 | 1.7 | 9 | 7.3 | 7 | 5.4 | 1 | 0.8 |
| Pamlico | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pasquotank | 1 | 2.6 | 1 | 2.9 | 1 | 2.5 | 1 | 2.4 | 0 | 0 |
| Pender | 2 | 4.3 | 1 | 2.4 | 3 | 6 | 0 | 0 | 2 | 3.8 |
| Perquimans | 1 | 8.2 | 1 | 8.8 | 0 | 0 | 0 | 0 | 0 | 0 |
| Person | 1 | 2.7 | 3 | 8.4 | 0 | 0 | 2 | 5.2 | 1 | 2.6 |
| Pitt | 5 | 3.5 | 5 | 3.7 | 11 | 7.4 | 6 | 3.9 | 6 | 3.8 |
| Polk | 1 | 5.3 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 10.2 |
| Randolph | 0 | 0 | 1 | 0.8 | 1 | 0.7 | 0 | 0 | 0 | 0 |
| Richmond | 0 | 0 | 1 | 2.1 | 0 | 0 | 3 | 6.3 | 1 | 2.1 |
| Robeson | 14 | 11 | 14 | 11.3 | 17 | 12.9 | 20 | 15.1 | 16 | 12 |
| Rockingham | 0 | 0 | 3 | 3.3 | 3 | 3.2 | 3 | 3.2 | 1 | 1.1 |
| Rowan | 0 | 0 | 5 | 3.8 | 2 | 1.4 | 3 | 2.2 | 3 | 2.1 |
| Rutherford | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1.6 | 1 | 1.5 |

| NC COUNTY TB CASES AND CASE RATES 2005-2009* | | | | | | | | | | |
|---|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|
| | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | |
| COUNTY | CASES | RATE | CASES | RATE | CASES | RATE | CASES | RATE | CASES | RATE |
| Sampson | 4 | 6.3 | 2 | 3.3 | 1 | 1.5 | 7 | 10.6 | 5 | 7.5 |
| Scotland | 1 | 2.7 | 3 | 8.3 | 5 | 13.2 | 4 | 10.6 | 0 | 0 |
| Stanly | 2 | 3.4 | 2 | 3.4 | 1 | 1.6 | 0 | 0 | 1 | 1.6 |
| Stokes | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Surry | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2.7 | 0 | 0 |
| Swain | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Transylvania | 0 | 0 | 0 | 0 | 1 | 3.3 | 1 | 3.2 | 0 | 0 |
| Tyrrell | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Union | 2 | 1.2 | 0 | 0 | 3 | 1.7 | 7 | 3.8 | 1 | 0.5 |
| Vance | 1 | 2.3 | 0 | 0 | 2 | 4.5 | 0 | 0 | 0 | 0 |
| Wake | 34 | 4.5 | 52 | 8.2 | 54 | 6.7 | 40 | 4.7 | 22 | 2.6 |
| Warren | 2 | 9.9 | 0 | 0 | 2 | 10 | 0 | 0 | 0 | 0 |
| Washington | 1 | 7.5 | 4 | 29.2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Watauga | 1 | 2.3 | 0 | 0 | 0 | 0 | 1 | 2.2 | 1 | 2.2 |
| Wayne | 16 | 13.8 | 8 | 7.1 | 9 | 7.7 | 3 | 2.6 | 8 | 6.7 |
| Wilkes | 1 | 1.5 | 2 | 3 | 1 | 1.5 | 2 | 2.9 | 1 | 1.4 |
| Wilson | 4 | 5.2 | 7 | 9.5 | 4 | 5.1 | 7 | 8.8 | 3 | 3.7 |
| Yadkin | 0 | 0 | 1 | 2.7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Yancey | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| North Carolina | 329 | 3.8 | 374 | 4.6 | 345 | 3.8 | 335 | 3.6 | 250 | 2.7 |

†Denominators for computing rates for the state were obtained from the Annual Estimates of the Population for the United States and Puerto Rico. Source: U.S. Census Bureau, American Community Survey. 2009 Rates were calculated based on the 2008 population estimates with the strata inflated to reflect the 1.07% increase of the total NC population from 2008 to 2009. 2008 rates were updated to be calculated on the actual 2008 Annual Estimates for North Carolina.

*Data source: NC EDSS TB Surveillance - Demographic Data Report. Rates are per 100,000.

Table 11: Foreign-Born TB Cases by County 2005-2009

| Foreign-Born TB Cases by County 2005-2009 | | | | | | |
|---|------|------|------|------|------|-------------------------|
| County | 2005 | 2006 | 2007 | 2008 | 2009 | Total Cases 2005 - 2009 |
| Alamance | 0 | 0 | 1 | 1 | 2 | 4 |
| 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 | 0 | 1 | 1 | 0 | 0 | 2 |
| Bertie | 0 | 0 | 0 | 0 | 0 | 0 |
| Bladen | 0 | 1 | 0 | 0 | 1 | 2 |
| Brunswick | 1 | 0 | 1 | 0 | 2 | 4 |
| Buncombe | 3 | 1 | 6 | 3 | 2 | 15 |
| Burke | 2 | 1 | 0 | 0 | 0 | 3 |
| Cabarrus | 3 | 1 | 1 | 3 | 0 | 8 |
| Caldwell | 0 | 0 | 0 | 0 | 1 | 1 |
| Camden | 0 | 0 | 0 | 0 | 0 | 0 |
| Carteret | 0 | 0 | 0 | 0 | 1 | 1 |
| Caswell | 0 | 0 | 0 | 0 | 0 | 0 |
| Catawba | 1 | 1 | 3 | 1 | 0 | 6 |
| Chatham | 1 | 1 | 0 | 2 | 1 | 5 |
| Cherokee | 0 | 1 | 0 | 0 | 0 | 1 |
| Chowan | 0 | 2 | 0 | 0 | 0 | 2 |
| Clay | 0 | 0 | 0 | 0 | 0 | 0 |
| Cleveland | 0 | 0 | 0 | 1 | 0 | 1 |
| Columbus | 1 | 0 | 1 | 0 | 0 | 2 |
| Craven | 0 | 0 | 2 | 0 | 2 | 4 |
| Cumberland | 1 | 1 | 0 | 1 | 0 | 3 |
| Currituck | 0 | 0 | 0 | 0 | 0 | 0 |
| Dare | 2 | 0 | 0 | 0 | 1 | 3 |
| Davidson | 1 | 4 | 6 | 2 | 2 | 15 |
| Davie | 0 | 0 | 0 | 0 | 0 | 0 |
| Duplin | 2 | 0 | 5 | 2 | 2 | 11 |
| Durham | 7 | 5 | 3 | 10 | 7 | 32 |
| Edgecombe | 0 | 0 | 0 | 1 | 0 | 1 |
| Forsyth | 7 | 8 | 8 | 9 | 7 | 39 |
| Franklin | 1 | 0 | 2 | 0 | 0 | 3 |
| Gaston | 1 | 0 | 2 | 3 | 0 | 6 |
| Gates | 0 | 0 | 0 | 0 | 0 | 0 |
| Graham | 0 | 0 | 0 | 0 | 0 | 0 |

| Foreign-Born TB Cases by County 2005-2009 | | | | | | |
|---|------|------|------|------|------|-------------------------|
| County | 2005 | 2006 | 2007 | 2008 | 2009 | Total Cases 2005 - 2009 |
| Granville | 0 | 1 | 0 | 0 | 0 | 1 |
| Greene | 0 | 0 | 0 | 0 | 0 | 0 |
| Guilford | 13 | 22 | 14 | 11 | 15 | 75 |
| Halifax | 0 | 0 | 0 | 0 | 0 | 0 |
| Harnett | 1 | 1 | 1 | 1 | 1 | 5 |
| Haywood | 0 | 0 | 0 | 0 | 0 | 0 |
| Henderson | 1 | 1 | 0 | 0 | 0 | 2 |
| Hertford | 0 | 0 | 0 | 0 | 0 | 0 |
| Hoke | 1 | 1 | 0 | 0 | 0 | 2 |
| Hyde | 0 | 0 | 0 | 0 | 1 | 1 |
| Iredell | 0 | 1 | 1 | 1 | 0 | 3 |
| Jackson | 0 | 0 | 0 | 0 | 1 | 1 |
| Johnston | 0 | 1 | 2 | 3 | 2 | 8 |
| Jones | 0 | 0 | 0 | 0 | 0 | 0 |
| Lee | 0 | 1 | 2 | 0 | 1 | 4 |
| Lenoir | 0 | 1 | 0 | 1 | 0 | 2 |
| Lincoln | 0 | 1 | 0 | 0 | 0 | 1 |
| Macon | 0 | 0 | 0 | 1 | 0 | 1 |
| Madison | 1 | 0 | 0 | 0 | 0 | 1 |
| Martin | 0 | 0 | 0 | 0 | 0 | 0 |
| McDowell | 0 | 0 | 0 | 0 | 0 | 0 |
| Mecklenburg | 25 | 27 | 21 | 15 | 14 | 102 |
| Mitchell | 0 | 0 | 0 | 0 | 0 | 0 |
| Montgomery | 1 | 0 | 1 | 0 | 0 | 2 |
| Moore | 1 | 0 | 1 | 0 | 1 | 3 |
| Nash | 2 | 2 | 0 | 0 | 0 | 4 |
| New Hanover | 2 | 5 | 1 | 3 | 0 | 11 |
| Northampton | 0 | 0 | 0 | 0 | 0 | 0 |
| Onslow | 0 | 1 | 2 | 2 | 1 | 6 |
| Orange | 1 | 0 | 6 | 5 | 1 | 13 |
| Pamlico | 0 | 0 | 0 | 0 | 0 | 0 |
| Pasquotank | 0 | 0 | 1 | 0 | 0 | 1 |
| Pender | 1 | 1 | 1 | 0 | 1 | 4 |
| Perquimans | 0 | 0 | 0 | 0 | 0 | 0 |
| Person | 0 | 3 | 0 | 2 | 0 | 5 |
| Pitt | 0 | 1 | 1 | 0 | 1 | 3 |
| Polk | 1 | 0 | 0 | 0 | 1 | 2 |
| Randolph | 0 | 0 | 0 | 0 | 0 | 0 |
| Richmond | 0 | 1 | 0 | 0 | 0 | 1 |

| Foreign-Born TB Cases by County 2005-2009 | | | | | | |
|--|-------------|-------------|-------------|-------------|-------------|--------------------------------|
| County | 2005 | 2006 | 2007 | 2008 | 2009 | Total Cases 2005 - 2009 |
| Robeson | 2 | 0 | 1 | 2 | 1 | 6 |
| Rockingham | 0 | 0 | 2 | 1 | 0 | 3 |
| Rowan | 0 | 1 | 1 | 2 | 1 | 5 |
| Rutherford | 0 | 0 | 0 | 1 | 0 | 1 |
| Sampson | 0 | 2 | 0 | 4 | 1 | 7 |
| Scotland | 0 | 0 | 0 | 0 | 0 | 0 |
| Stanly | 0 | 0 | 0 | 0 | 0 | 0 |
| Stokes | 0 | 0 | 0 | 0 | 0 | 0 |
| Surry | 0 | 0 | 0 | 1 | 0 | 1 |
| Swain | 0 | 0 | 0 | 0 | 0 | 0 |
| Transylvania | 0 | 0 | 1 | 0 | 0 | 1 |
| Tyrrell | 0 | 0 | 0 | 0 | 0 | 0 |
| Union | 1 | 0 | 2 | 3 | 0 | 6 |
| Vance | 0 | 0 | 0 | 0 | 0 | 0 |
| Wake | 17 | 31 | 35 | 22 | 15 | 120 |
| Warren | 0 | 0 | 0 | 0 | 0 | 0 |
| Washington | 0 | 1 | 0 | 0 | 1 | 2 |
| Watauga | 1 | 0 | 0 | 0 | 0 | 1 |
| Wayne | 4 | 0 | 2 | 0 | 0 | 6 |
| Wilkes | 0 | 1 | 1 | 0 | 0 | 2 |
| Wilson | 0 | 1 | 0 | 3 | 1 | 5 |
| Yadkin | 0 | 0 | 0 | 0 | 0 | 0 |
| Yancey | 0 | 0 | 0 | 0 | 0 | 0 |
| North Carolina | 110 | 137 | 142 | 123 | 92 | 604 |

DATA SOURCE: North Carolina Electronic Disease Surveillance System (NC EDSS)

Table 12: Foreign-Born Cases by Country of Origin 2005-2009

| Year | 2005 | 2006 | 2007 | 2008 | 2009 | Total Cases 2005 – 2009 |
|-------------------------------------|------|------|------|------|------|----------------------------|
| Albania | 0 | 1 | 1 | 0 | 0 | 2 |
| Algeria | 1 | 1 | 0 | 0 | 0 | 2 |
| Argentina | 0 | 0 | 0 | 1 | 0 | 1 |
| Azerbaijan | 1 | 0 | 0 | 0 | 0 | 1 |
| Bangladesh | 1 | 0 | 0 | 0 | 0 | 1 |
| Belarus | 1 | 0 | 0 | 0 | 0 | 1 |
| Bhutan | 0 | 0 | 0 | 1 | 0 | 1 |
| Bosnia & Herzegovina | 1 | 0 | 0 | 0 | 0 | 1 |
| Brazil | 0 | 1 | 0 | 0 | 0 | 1 |
| British Virgin Islands | 0 | 0 | 1 | 0 | 0 | 1 |
| Burma | 0 | 1 | 1 | 2 | 0 | 4 |
| Cambodia | 2 | 9 | 4 | 1 | 3 | 19 |
| China | 1 | 3 | 4 | 2 | 1 | 11 |
| Colombia | 1 | 2 | 1 | 0 | 1 | 5 |
| Congo | 3 | 1 | 0 | 1 | 0 | 5 |
| Costa Rica | 0 | 0 | 0 | 1 | 0 | 1 |
| Cuba | 0 | 1 | 0 | 0 | 0 | 1 |
| Dominican Republic | 0 | 1 | 0 | 0 | 0 | 1 |
| Ecuador | 0 | 1 | 2 | 0 | 0 | 3 |
| El Salvador | 2 | 3 | 6 | 4 | 2 | 17 |
| Ethiopia | 3 | 5 | 3 | 3 | 1 | 15 |
| Gambia | 1 | 0 | 0 | 0 | 0 | 1 |
| Ghana | 0 | 0 | 1 | 2 | 1 | 4 |
| Guatemala | 2 | 3 | 3 | 3 | 7 | 18 |
| Haiti | 0 | 0 | 1 | 2 | 1 | 4 |
| Honduras | 6 | 6 | 8 | 11 | 2 | 33 |
| India | 7 | 14 | 16 | 11 | 6 | 54 |
| Indonesia | 1 | 1 | 3 | 1 | 0 | 6 |
| Iran | 0 | 0 | 0 | 0 | 1 | 1 |
| Ivory Coast | 0 | 1 | 0 | 0 | 0 | 1 |
| Jordan | 0 | 0 | 0 | 0 | 1 | 1 |
| Kazakhstan | 0 | 1 | 0 | 0 | 0 | 1 |
| Kenya | 0 | 2 | 3 | 3 | 2 | 10 |
| Korea Democratic Peoples Rep. | 0 | 1 | 1 | 0 | 0 | 2 |
| Korea Republic of | 1 | 0 | 2 | 3 | 1 | 7 |

| Year | 2005 | 2006 | 2007 | 2008 | 2009 | Total Cases 2005 – 2009 |
|--------------|------------|------------|------------|------------|-----------|----------------------------|
| Kuwait | 0 | 0 | 0 | 0 | 1 | 1 |
| Laos | 1 | 1 | 4 | 0 | 2 | 8 |
| Liberia | 4 | 2 | 2 | 0 | 0 | 8 |
| Malaysia | 0 | 0 | 1 | 0 | 1 | 2 |
| Mexico | 44 | 44 | 54 | 41 | 33 | 216 |
| Morocco | 0 | 0 | 2 | 0 | 1 | 3 |
| Nepal | 1 | 2 | 1 | 0 | 0 | 4 |
| Netherlands | 0 | 0 | 0 | 0 | 1 | 1 |
| Nicaragua | 1 | 0 | 0 | 0 | 0 | 1 |
| Niger | 1 | 1 | 0 | 0 | 0 | 2 |
| Nigeria | 1 | 0 | 0 | 0 | 3 | 4 |
| Pakistan | 0 | 2 | 0 | 2 | 1 | 5 |
| Peru | 2 | 1 | 1 | 1 | 1 | 6 |
| Philippines | 4 | 3 | 6 | 7 | 4 | 24 |
| Puerto Rico | 0 | 0 | 0 | 0 | 1 | 1 |
| Romania | 0 | 1 | 0 | 0 | 0 | 1 |
| Senegal | 1 | 0 | 0 | 1 | 1 | 3 |
| Somalia | 1 | 1 | 0 | 1 | 0 | 3 |
| South Africa | 1 | 0 | 0 | 0 | 0 | 1 |
| Soviet Union | 1 | 0 | 0 | 0 | 0 | 1 |
| Sudan | 0 | 0 | 0 | 1 | 1 | 2 |
| Taiwan | 1 | 0 | 0 | 1 | 0 | 2 |
| Thailand | 0 | 1 | 0 | 1 | 0 | 2 |
| Turkey | 0 | 1 | 0 | 0 | 0 | 1 |
| Turkmenistan | 0 | 0 | 0 | 1 | 0 | 1 |
| Ukraine | 1 | 0 | 0 | 2 | 0 | 3 |
| Uruguay | 0 | 1 | 0 | 0 | 0 | 1 |
| Vietnam | 8 | 16 | 9 | 11 | 10 | 54 |
| Zimbabwe | 0 | 0 | 0 | 0 | 1 | 1 |
| Total | 108 | 136 | 141 | 122 | 92 | 599 |

***Does not include persons born in US territories.**

DATA SOURCE: North Carolina Electronic Disease Surveillance System (NC EDSS)

Table 13: Hispanic TB Cases by County 2005-2009

| Hispanic TB Cases by County 2005-2009 | | | | | | |
|--|-------------|-------------|-------------|-------------|-------------|--|
| County | 2005 | 2006 | 2007 | 2008 | 2009 | Total Cases 2005 - 2009 |
| Alamance | 0 | 1 | 2 | 3 | 2 | 8 |
| 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 | 0 | 0 | 1 | 0 | 0 | 1 |
| Bertie | 0 | 0 | 0 | 0 | 0 | 0 |
| Bladen | 0 | 1 | 0 | 0 | 1 | 2 |
| Brunswick | 0 | 0 | 0 | 0 | 2 | 2 |
| Buncombe | 3 | 1 | 13 | 2 | 2 | 21 |
| Burke | 2 | 1 | 0 | 0 | 0 | 3 |
| Cabarrus | 2 | 1 | 0 | 3 | 0 | 6 |
| Caldwell | 0 | 0 | 0 | 0 | 2 | 2 |
| Camden | 0 | 0 | 0 | 0 | 0 | 0 |
| Carteret | 0 | 0 | 0 | 0 | 0 | 0 |
| Caswell | 0 | 0 | 0 | 0 | 0 | 0 |
| Catawba | 2 | 1 | 2 | 1 | 0 | 6 |
| Chatham | 1 | 1 | 0 | 1 | 1 | 4 |
| Cherokee | 0 | 1 | 0 | 0 | 0 | 1 |
| Chowan | 0 | 2 | 0 | 0 | 0 | 2 |
| Clay | 0 | 0 | 0 | 0 | 0 | 0 |
| Cleveland | 0 | 0 | 0 | 0 | 0 | 0 |
| Columbus | 1 | 0 | 2 | 0 | 0 | 3 |
| Craven | 0 | 0 | 2 | 0 | 1 | 3 |
| Cumberland | 1 | 1 | 0 | 1 | 1 | 4 |
| Currituck | 0 | 0 | 0 | 0 | 0 | 0 |
| Dare | 2 | 0 | 0 | 0 | 0 | 2 |
| Davidson | 0 | 3 | 3 | 1 | 2 | 9 |
| Davie | 0 | 0 | 0 | 0 | 0 | 0 |
| Duplin | 3 | 1 | 6 | 2 | 3 | 15 |
| Durham | 7 | 2 | 2 | 4 | 2 | 17 |
| Edgecombe | 0 | 0 | 0 | 1 | 0 | 1 |
| Forsyth | 3 | 8 | 5 | 9 | 4 | 29 |
| Franklin | 1 | 0 | 2 | 0 | 0 | 3 |

| Hispanic TB Cases by County 2005-2009 | | | | | | |
|--|-------------|-------------|-------------|-------------|-------------|--------------------------------|
| County | 2005 | 2006 | 2007 | 2008 | 2009 | Total Cases 2005 - 2009 |
| Gaston | 0 | 0 | 1 | 1 | 0 | 2 |
| Gates | 0 | 0 | 0 | 0 | 0 | 0 |
| Graham | 0 | 0 | 0 | 0 | 0 | 0 |
| Granville | 0 | 0 | 0 | 0 | 0 | 0 |
| Greene | 0 | 0 | 0 | 0 | 0 | 0 |
| Guilford | 3 | 5 | 5 | 1 | 3 | 17 |
| Halifax | 0 | 0 | 0 | 0 | 0 | 0 |
| Harnett | 1 | 0 | 1 | 2 | 1 | 5 |
| Haywood | 0 | 0 | 0 | 0 | 0 | 0 |
| Henderson | 1 | 0 | 0 | 0 | 0 | 1 |
| Hertford | 0 | 0 | 0 | 0 | 0 | 0 |
| Hoke | 1 | 1 | 0 | 0 | 0 | 2 |
| Hyde | 0 | 1 | 0 | 0 | 1 | 2 |
| Iredell | 2 | 0 | 1 | 1 | 0 | 4 |
| Jackson | 0 | 0 | 0 | 0 | 1 | 1 |
| Johnston | 1 | 1 | 3 | 4 | 1 | 10 |
| Jones | 0 | 0 | 0 | 0 | 0 | 0 |
| Lee | 0 | 1 | 2 | 0 | 1 | 4 |
| Lenoir | 0 | 1 | 0 | 1 | 0 | 2 |
| Lincoln | 0 | 1 | 0 | 0 | 0 | 1 |
| Macon | 0 | 0 | 0 | 1 | 0 | 1 |
| Madison | 1 | 0 | 0 | 0 | 0 | 1 |
| Martin | 0 | 0 | 0 | 0 | 0 | 0 |
| McDowell | 0 | 0 | 0 | 1 | 0 | 1 |
| Mecklenburg | 13 | 10 | 12 | 12 | 5 | 52 |
| Mitchell | 0 | 0 | 0 | 0 | 0 | 0 |
| Montgomery | 1 | 1 | 1 | 0 | 0 | 3 |
| Moore | 1 | 0 | 0 | 0 | 1 | 2 |
| Nash | 2 | 2 | 0 | 0 | 0 | 4 |
| New Hanover | 2 | 5 | 1 | 2 | 1 | 11 |
| Northampton | 0 | 0 | 0 | 0 | 0 | 0 |
| Onslow | 0 | 1 | 0 | 1 | 0 | 2 |
| Orange | 1 | 1 | 5 | 4 | 0 | 11 |
| Pamlico | 0 | 0 | 0 | 0 | 0 | 0 |
| Pasquotank | 0 | 0 | 0 | 0 | 0 | 0 |
| Pender | 1 | 1 | 2 | 0 | 1 | 5 |

| Hispanic TB Cases by County 2005-2009 | | | | | | |
|--|-------------|-------------|-------------|-------------|-------------|--------------------------------|
| County | 2005 | 2006 | 2007 | 2008 | 2009 | Total Cases 2005 - 2009 |
| Perquimans | 0 | 0 | 0 | 0 | 0 | 0 |
| Person | 0 | 3 | 0 | 2 | 0 | 5 |
| Pitt | 0 | 0 | 1 | 0 | 1 | 2 |
| Polk | 0 | 0 | 0 | 0 | 1 | 1 |
| Randolph | 0 | 0 | 0 | 0 | 0 | 0 |
| Richmond | 0 | 1 | 0 | 0 | 0 | 1 |
| Robeson | 1 | 0 | 1 | 0 | 1 | 3 |
| Rockingham | 0 | 0 | 1 | 0 | 0 | 1 |
| Rowan | 0 | 1 | 0 | 2 | 1 | 4 |
| Rutherford | 0 | 0 | 0 | 0 | 0 | 0 |
| Sampson | 1 | 2 | 0 | 4 | 1 | 8 |
| Scotland | 0 | 0 | 0 | 0 | 0 | 0 |
| Stanly | 0 | 1 | 0 | 0 | 0 | 1 |
| Stokes | 0 | 0 | 0 | 0 | 0 | 0 |
| Surry | 0 | 0 | 0 | 0 | 0 | 0 |
| Swain | 0 | 0 | 0 | 0 | 0 | 0 |
| Transylvania | 0 | 0 | 1 | 0 | 0 | 1 |
| Tyrrell | 0 | 0 | 0 | 0 | 0 | 0 |
| Union | 2 | 0 | 2 | 1 | 0 | 5 |
| Vance | 0 | 0 | 0 | 0 | 0 | 0 |
| Wake | 5 | 8 | 18 | 14 | 8 | 53 |
| Warren | 0 | 0 | 0 | 0 | 0 | 0 |
| Washington | 0 | 1 | 0 | 0 | 1 | 2 |
| Watauga | 1 | 0 | 0 | 0 | 0 | 1 |
| Wayne | 3 | 0 | 3 | 0 | 0 | 6 |
| Wilkes | 0 | 1 | 0 | 0 | 0 | 1 |
| Wilson | 0 | 1 | 0 | 3 | 1 | 5 |
| Yadkin | 0 | 0 | 0 | 0 | 0 | 0 |
| Yancey | 0 | 0 | 0 | 0 | 0 | 0 |
| North Carolina | 72 | 75 | 101 | 85 | 54 | 387 |

DATA SOURCE: North Carolina Electronic Disease Surveillance System (NC EDSS)