

Children's Health



Low-birth-weight infants remain a major problem.

Many believe that the status of, and commitment to, child health in a community reflects the values, overall health and well-being of the community.

How child health is measured varies. For some it's a measure of a few commonly accepted markers that typically include infant mortality rates, immunization rates, hospital admission rates, child death rates etc. Others take a broader view and see child health status as a reflection of those items plus many of the environmental factors that influence a child's overall well-being. Among these are the proportion of children living in poverty, school drop-out rates, proportion of children engaged in risky behaviors, educational achievement, gang involvement and exposure to environmental toxins.

One source that includes quality-of-life issues in child health is the Annie E. Casey Foundation's *Kids Count* report. In the *Kids Count 2006* report, Tennessee ranked 46 out of 50 states, and in most measurements Shelby County lagged behind the rest of the state.

While the data for child health in Shelby County looks grim, there is reason for some optimism. Infant mortality rates, birth rates for 15-17-year-old girls, and new cases of Type II diabetes are leveling off or declining in Shelby County. There appears to be the promise of increasing interest in identifying proven interventions to improve child health.

Infant mortality rate reflects a community's overall health.

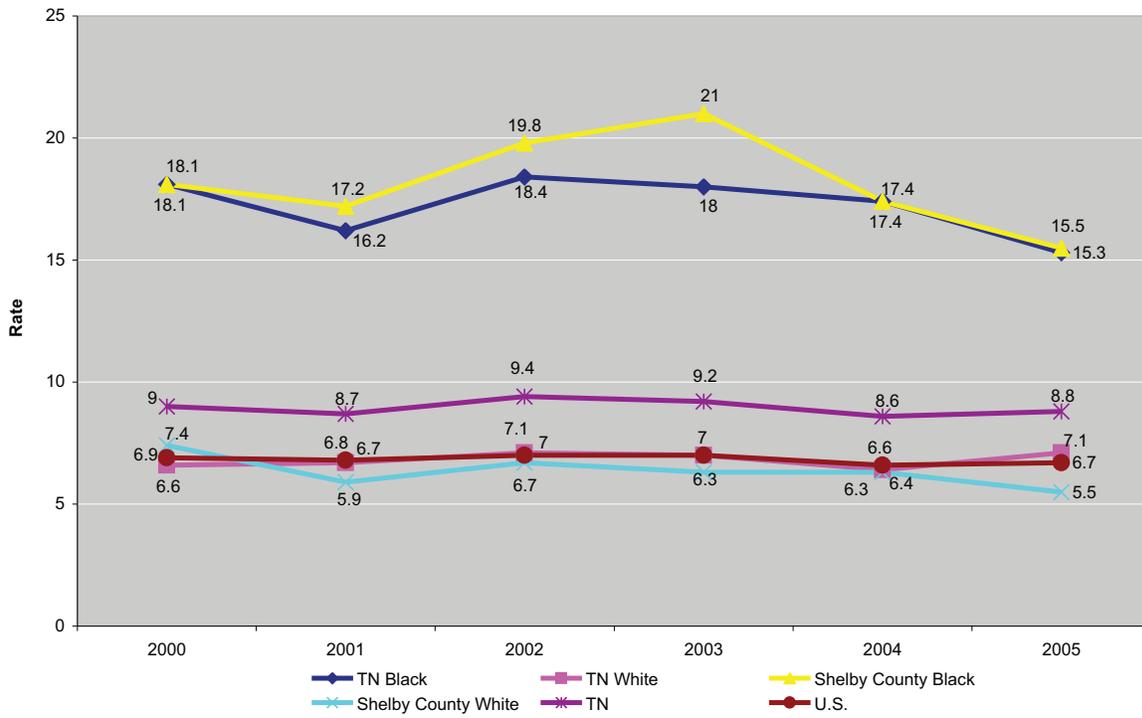
The infant mortality rate (IMR) is the number of deaths occurring in the first 12 months of life per 1,000 live births. It is one measure of the overall health of a community and reflects, to some degree, the commitment of a community to infants and to young mothers. It is one indicator also of access to care, quality of care, socioeconomic conditions and public health intervention. Despite the fact that, as a nation, one out of every six dollars is spent on healthcare, the U.S. has a higher IMR than many other nations.

Infants who die within the first month of life usually are those who are born very prematurely or with serious congenital anomalies, particularly of the cardiovascular system and/or respiratory tract. Infant deaths after one month and before 12 months of age are most frequently a result of Sudden Infant Death Syndrome (SIDS), congenital malformations or accidents.

Black IMR in Shelby County more than double U.S. rate.

The IMR in Shelby County varies greatly between the black and white populations. The 2005 black rate was 15.5 deaths per 1,000 births, almost three times the white rate in Shelby County (5.5) and more than double the overall U.S. rate. The good news in Shelby County is that, after a two-year spike in the IMR among black children, it decreased from 2003 to 2005 by 26 percent and came within two-tenths-of-one percent of the state average among black infants. The black IMR in Shelby County remains substantially more than double the overall U.S. rate, while the IMR among white Shelby Countians has continued to drop to more than 40 percent below the overall U.S. average.

Infant Death Rates per Thousand Births, 2000-2005



Source: Tennessee Department of Health Vital Statistics

- The basis for the difference in mortality between black and white infants is complex. Black infants are more likely than whites to be born prematurely and at a low birth-weight.
- While blacks as a group have less income than whites, the correlation between poverty and infant mortality is inconsistent.
- Among black and white mothers, the higher the educational level, the lower the infant mortality rate. Nevertheless, college-educated, non-smoking black women have a slightly higher IMR than do smoking white women who have not graduated from high school.
- A black infant born after 37 weeks of gestation (considered full term) has a higher infant mortality rate (1.74 times) than a white infant.

Reasons for the decrease in infant mortality in Shelby County from 2003 to 2005 are unclear. Undoubtedly more effective care of premature infants has contributed to a higher survival rate for at-risk infants. The State of Tennessee has made a major commitment to reduce infant mortality. Since Memphis has one of the highest IMRs in the state, the state has devoted resources to address specifically the issue in Shelby County.

In addition there are many local projects that focus on this issue. They include the Memphis Shelby County Health Department initiatives known as Healthy Start and Help Us Grow (HUG) programs. These and other efforts undoubtedly have contributed to the IMR decline in Shelby County, but much remains to be accomplished. (*Tennessee Department of Health Office of Policy, Planning and Assessment. Tennessee's Racial Disparity in Infant Mortality. March 2006; Tennessee Department of Health Vital Statistics 2005*)

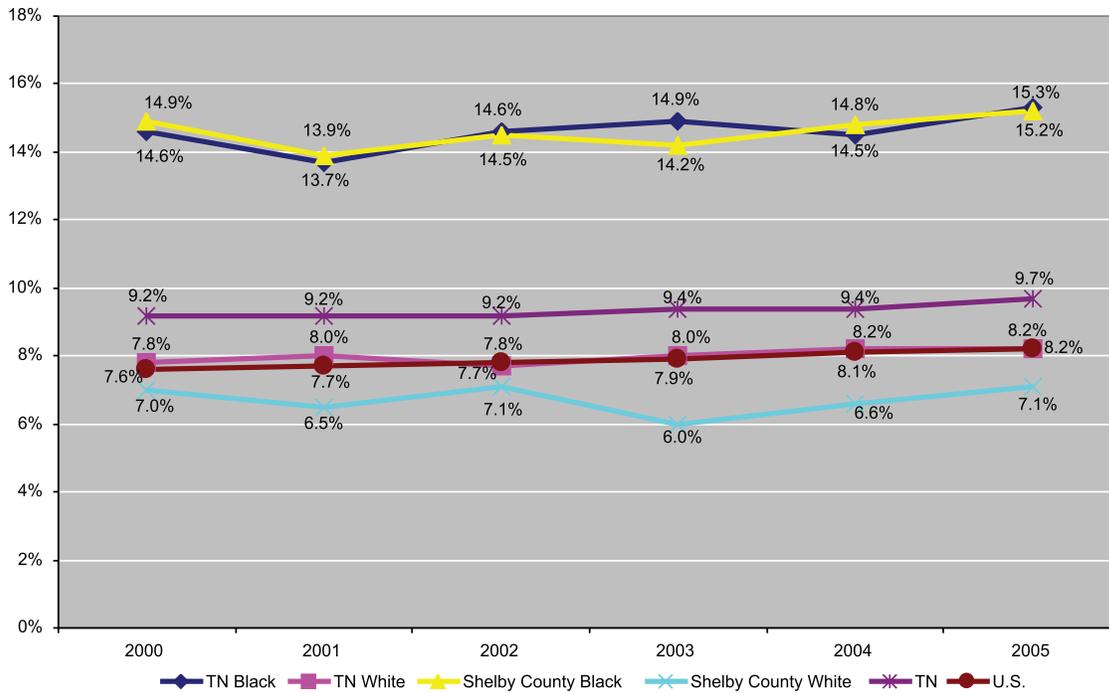
Low birth-weight is hard to overcome.

The earlier an infant is born, the greater the risk of death. Two-thirds of infants who die in the first year of life are born at less than 37 weeks gestation and are considered “*premature.*” While low birth-weight does not correlate exactly with gestational age, it frequently is used as a measurement of premature birth because determining exact gestational age often is difficult.

- Babies born weighing 2,500 grams (5 pounds, 8 ounces) and above, have a mortality rate of 3.3-per 1,000 live births.
- Low birth-weight infants (1,500-2,499 grams) die at a rate 18 times higher.
- Very low birth-weight infants (less than 1,500 grams at birth or less than 3 pounds, 5 ounces) have an IMR of 256 per 1,000 or 77 times higher than that of normal birth-weight infants.
- Reduction in premature births should reduce the number of infant deaths.

Nationwide the rate of low birth-weight/premature births has increased. In both Tennessee and Shelby County, the rate of low birth-weight newborns has remained flat over the past six years. An increasing percentage of premature infants are born after 32-37 weeks of gestation. At the same time there has been a slight decrease in those born at highest risk, before 32 weeks gestation. This trend, along with the improved care provided for premature babies, probably accounts for the continued decline in IMR despite the continuing high rate of premature births.

Percentage of Low-Weight Births, 2000-2005

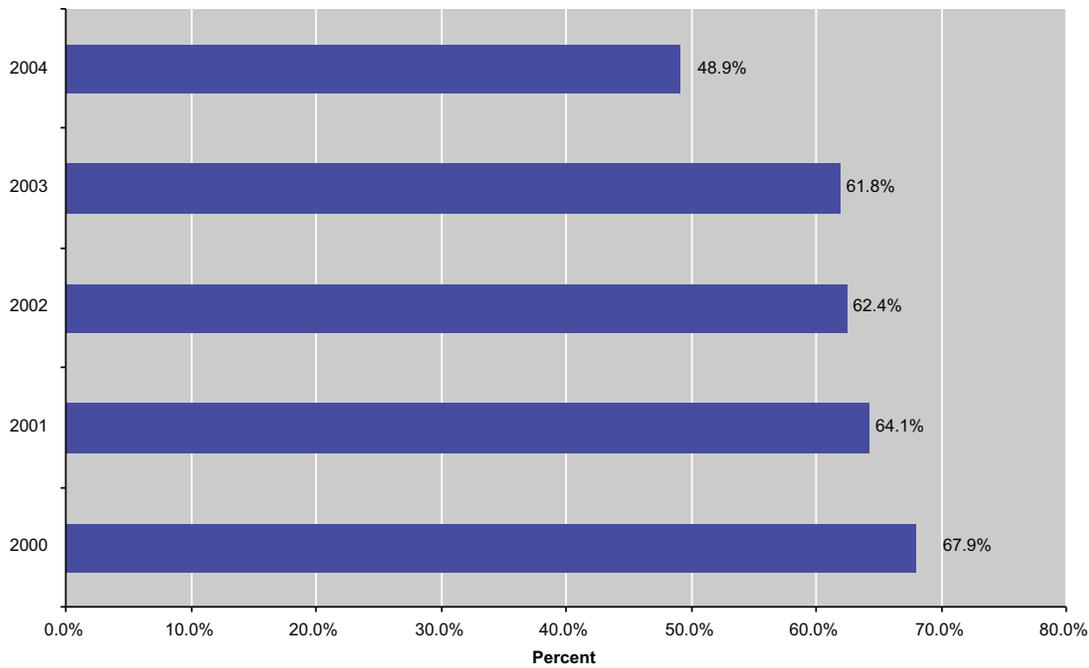


Source: Tennessee Department of Health Vital Statistics

As with mortality rates, there is a difference in the percentage of low birth-weight infants of black mothers and white mothers. Black mothers are more than twice as likely to have a premature baby as are white mothers.

Prematurity and low birth-weight are influenced by social, economic, biologic and genetic factors. There have been many efforts to reduce prematurity. One example has been the effort to extend early prenatal care to more women. Earlier prenatal care improves the health of both the mother and the fetus and contributes to a reduction in infant mortality. Yet, there is little evidence to suggest that early prenatal care decreases the likelihood of prematurity. Nevertheless, a disturbing trend in Shelby County is the 28 percent decline in babies whose mothers received adequate prenatal care.

Percent of Mothers in Shelby County with 'Adequate' Pre-Natal Care, 2000-2004



Source: Annie E. Casey Foundation; CLIKS Online.

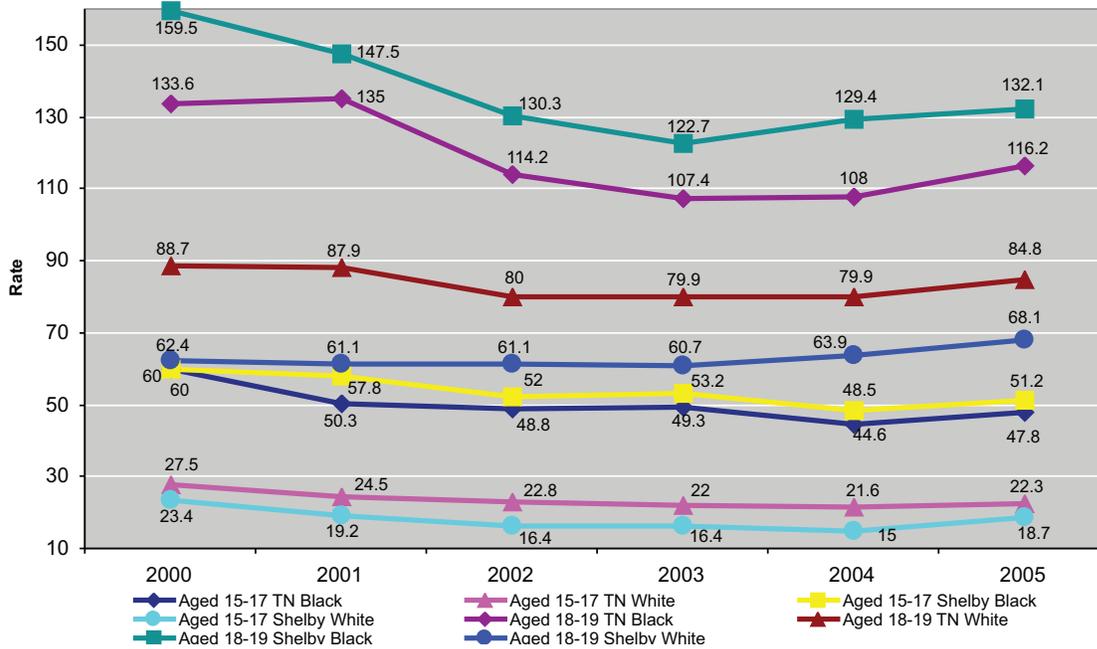
Although we know more about factors that influence a mother going into labor, there still is no unifying hypothesis to explain premature labor. (*Institute of Medicine. Preterm Births. Causes, Consequences and Prevention. Behrman RE and Butler AS eds. 2006; March of Dimes Peristats. Marchofdimes.com/peristats/*)

The risks for children of teenage mothers continue throughout life.

Pregnant women at greatest risk of delivering prematurely are those who are less than 20 years old at the time of delivery and those in their late 30s and older. Of the more than 14,000 births in Shelby County approximately 12 percent are to teenage mothers. In addition to having a higher infant mortality rate, children of teenage mothers are likely to grow up in poverty and suffer the consequences of poor health attendant with poverty.

Nationally there has been a steady decline in birth rates among teenagers since the 1960s. Tennessee and Shelby County have experienced similar trends, although there appears to be a leveling off and, perhaps, a slight increase in teenage birth rates in recent years.

Birth Rate per Thousand Females Age 15-19 by Race, 2000-2005



Source: Tennessee Department of Health Vital Statistics

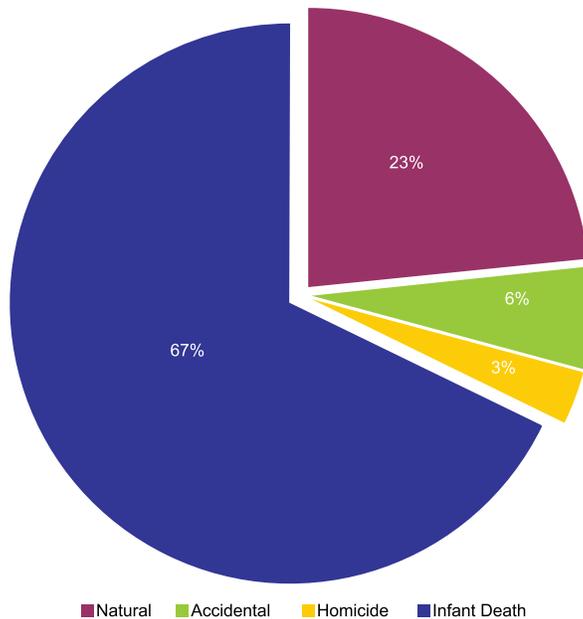
- The birth rate among black teens 15-17 years old is more than three times that of white girls 15-17. The good news is that among both black and white girls of these ages the birth rates dropped from 2000 to 2005 by 17 percent and 26 percent, respectively.
- The rate among black teens 18-19 years old is about double the white rate of 18-19-year-olds. The birth rate among 18-19-year-old black girls, though, dropped 17 percent from 2000 to 2005, while the rate among white girls the same ages increased by almost nine percent.

Programs focused on reducing teen pregnancy are wide-ranging in their approaches. Some promote abstinence and others the use of contraception. One factor that has contributed to the decline has been a greater willingness among adults to discuss teenage pregnancy and sexuality and to recognize the problems faced by teenage mothers. It is unclear, though, what has contributed the most to cause the decline. (*Institute of Medicine. Preterm Births. Causes, Consequences, and Prevention. Behrman RE and Butler AS eds. 2006; March of Dimes Peristats. Marchofdimes.com/peristats/; Annie E. Casey, Kids Count. CLICKS; Child Trends Data Bank*)

Sixty eight percent of deaths in the first 14 years in Shelby County occur in infancy.

In Shelby County two out of three children who die before age 15 die in the first year. Of deaths between age 1 and age 14 in Shelby County more than two-thirds are due to so-called natural causes. These include deaths from congenital anomalies and genetic conditions, infectious diseases and malignancy. Of the remaining deaths between age 1 and age 14 the majority is due to “unintentional injuries” (accidents).

Percent of Deaths of Shelby County Children Age 0-14 by Cause of Death, 2005



Source: Shelby County Health Department

The 2004 data nationally for 15-19- year-olds show that 50 percent of deaths are due to accidents, 14 percent homicides, 12 percent suicides and five percent to malignancy. While these data are not available for Shelby County, it is likely that they would reflect a similar pattern. (Hamilton BE et al, *Annual summary of vital statistics: 2005, Pediatrics*. 2007; 119:345-360.)

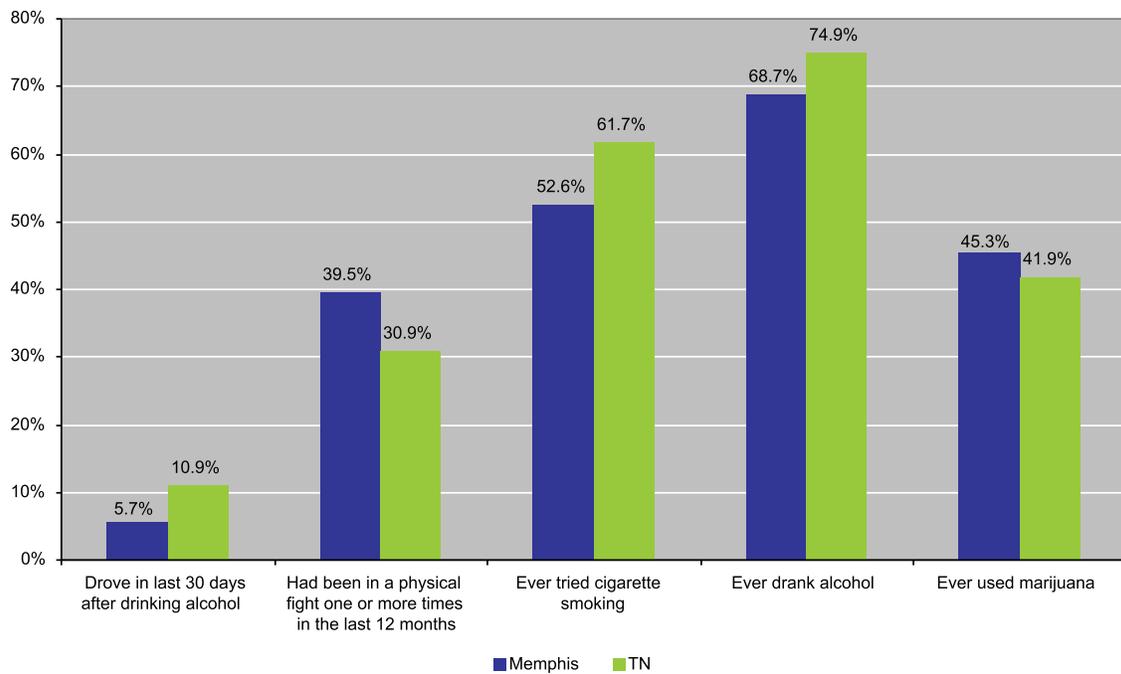
High-risk health behavior begins in adolescence.

Most high-risk health behavior is established during childhood or adolescence and continues into adulthood. For example, alcohol and/or drug use that contributes to motor vehicle accidents, unintentional injuries, homicide and suicide, begins as early as middle school. Likewise, unhealthy diet, lack of physical activity and tobacco use, all of which are linked closely to cardiovascular disease and cancer, begin before adulthood.

The City of Memphis is fortunate to have a validated mechanism, the *Youth Risk Behavioral Survey (YRBS)* to monitor the prevalence of risky health behavior among middle and high school students. The survey monitors six categories of health behavior thought to have the greatest impact on health and well-being. These categories include:

- Behavior that contributes to injuries
- Tobacco, alcohol and drug use
- Sexual activities
- Poor diet
- Lack of adequate physical activity

Percent of 'Risky Behavior' by Adolescents in Memphis and Tennessee, 2005



Source: Youth Behavioral Risk Surveillance Survey, 2005

One-fourth of high school students and one-third of middle school students reported riding in a car “in the last 30 days with a driver who had been drinking.” This is significant since motor vehicle crashes are the leading cause of death nationally among children age 1 to 18 and, of those crashes that result in injuries, approximately one-third involve alcohol.

There’s a direct correlation between violent behavior and school success. Students who engage in violence demonstrate a lack of interest in school. They have more behavior problems, higher absenteeism and drop-out rates. (Birnbaum AS, Lytle LA, Hannan PJ, Murray DM, Perry CL, Forster JL. *School functioning and violent behavior among young adolescents: a contextual analysis. Health Edu Res* 2003 Jun;18(3):389-403) Forty percent of MCS high school students reported being in a fight one or more times in the last 12 months.

Smoking remains a serious problem.

Tobacco use is the most common cause of preventable disease and death in the U.S., and it begins most commonly in adolescence or early adulthood. Eighty percent of adult smokers began smoking before the age of 20. Of people who start smoking as teens, approximately one-third will die prematurely of a smoking-related disease. Furthermore, tobacco is considered a gateway drug that can lead to alcohol, marijuana and other illegal drug use.

Over half of MCS high school and 40 percent of MCS middle school students reported having tried cigarettes. While these numbers are lower than reported by students statewide, and less than five percent of students report smoking cigarettes daily, we should not become complacent about adolescent tobacco use.

Smoking also has a negative impact on younger children. Environmental tobacco smoke (ETS), also known as second-hand smoke, contains almost 4,000 chemicals to which infants and children are exposed when someone smokes around them. Children, especially young children, who breathe ETS are at risk for many serious health problems such as ear infections, hearing problems, respiratory infections and asthma. (Committee on Environmental Health, *Environmental Tobacco Smoke: A Hazard to Children. Pediatrics* 1997 99: 639-642)

Additionally, smoking during pregnancy can lead to serious health problems in newborns. Babies born to mothers who smoke are twice as likely to be born with low birth-weight and are three times as likely to die from Sudden Infant Death Syndrome. The U.S. Public Health Service estimates that if all pregnant women in the United States stopped smoking there would be an 11 percent reduction in stillbirths and a five percent reduction in newborn deaths. (March of Dimes. http://www.marchofdimes.com/professionals/14332_1171.asp)

Adolescent use of alcohol is linked to delinquent behavior.

According to the National Institute on Alcohol Abuse and Alcoholism, adolescents who begin drinking before age 15 are four times more likely to develop alcohol dependence than those who begin at age 21.

- There is mounting evidence that repeated exposure to alcohol during adolescence leads to long-lasting deficits in cognitive abilities, including learning capability and memory.
- Alcohol use has a negative impact on school performance and is related to high-risk sexual behavior, depression, suicide and other drug use.
- Adolescent alcohol use also has been associated with an increased risk of physical or sexual abuse, often by persons of the same age. Researchers estimate that alcohol use is implicated in at least one-third of cases of sexual assault and acquaintance-or-date-rape cases among adolescents and college students.
- Adolescents who use alcohol while pregnant increase their risk of having complications during pregnancy as well as giving birth to an infant with fetal alcohol syndrome. (*Alcohol and Development in Youth-A Multidisciplinary Overview. Alcohol Research and Health. Volume 28, Number 3, 2004/2005*)
- Alcohol use was reported by two-thirds of MCS high school students and 44 percent of middle school students. One-third of the high school students reported use “within the last 30 days.”

Marijuana use remains high among MCS teens.

Almost half of MCS high school students surveyed reported using marijuana at least once (45.3%) and almost a one-fourth (23.5%) reported using it in the past 30 days. These percentages are slightly higher than those reported by high school students statewide. Less than half as many MCS students, however, reported use of methamphetamine (2.4%) than students statewide (5.6%). This may be a result of the high proportion of black students in the MCS system and the lower incidence of use of methamphetamines among black youth.

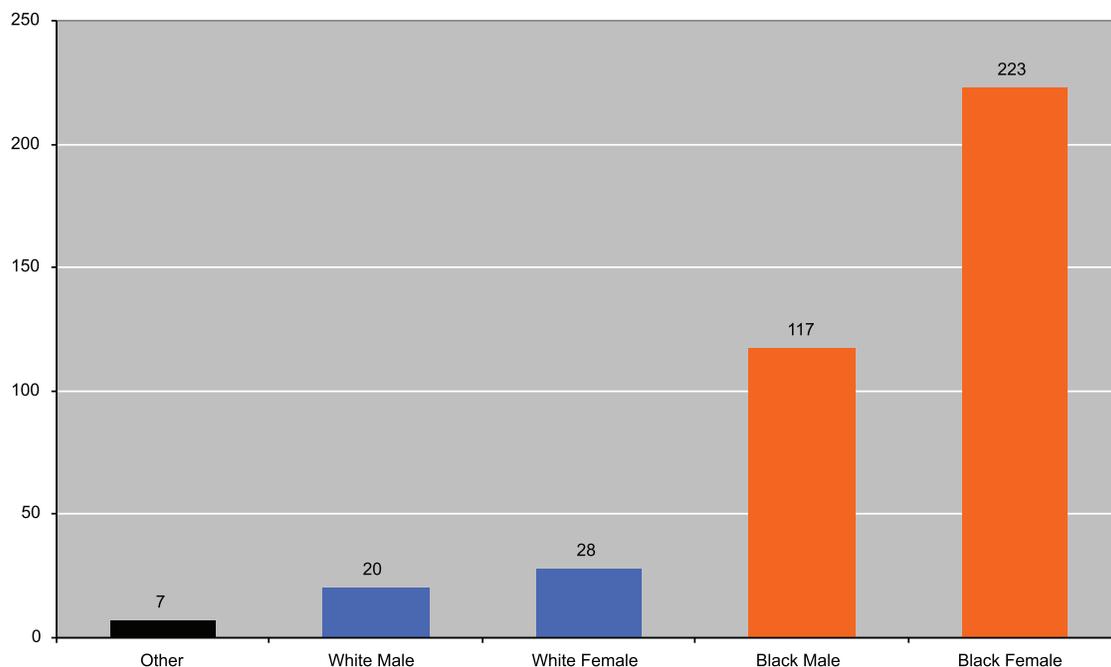
Obesity is an epidemic locally and statewide.

The Tennessee Comptroller's Report (March, 2006), "Weighing the Costs of Obesity in Tennessee," includes, "State law has recognized Tennessee as a state with epidemic proportions of childhood obesity, one of the highest rates of pediatric obesity and childhood type II diabetes, and one of the highest rates of heart disease in the United States."

Also from the report is data that direct medical costs associated with obesity in Tennessee were \$1.84 billion in 2003. Numerous epidemiological studies have shown that overweight children are more likely to be overweight adults and suffer from the complications of obesity (e.g. diabetes, cardiovascular disease, hypertension, stroke, osteoarthritis, gall bladder disease, breast cancer, colon cancer and depression).

Local data from the University of Tennessee Health Science Center (UTHSC) demonstrate the dramatic increase in type II diabetes associated with the rise in obesity. Once thought of as an adult disease, and even referred to as "adult-onset diabetes," type II diabetes used to be rare in children. In 1990 there were four cases diagnosed at UTHSC. Since that time there have been almost 400 cases diagnosed. The number of cases peaked in 2002 with 45 new cases diagnosed and now appears to have decreased slightly. Black females are at greatest risk.

Number of Cases of Type 2 Diabetes in Children by Race & Gender, 1990-2006



Source: University of Tennessee Health Science Center & Le Bonheur Children's Medical Center, Stender, Christensen, Burghen, et al.

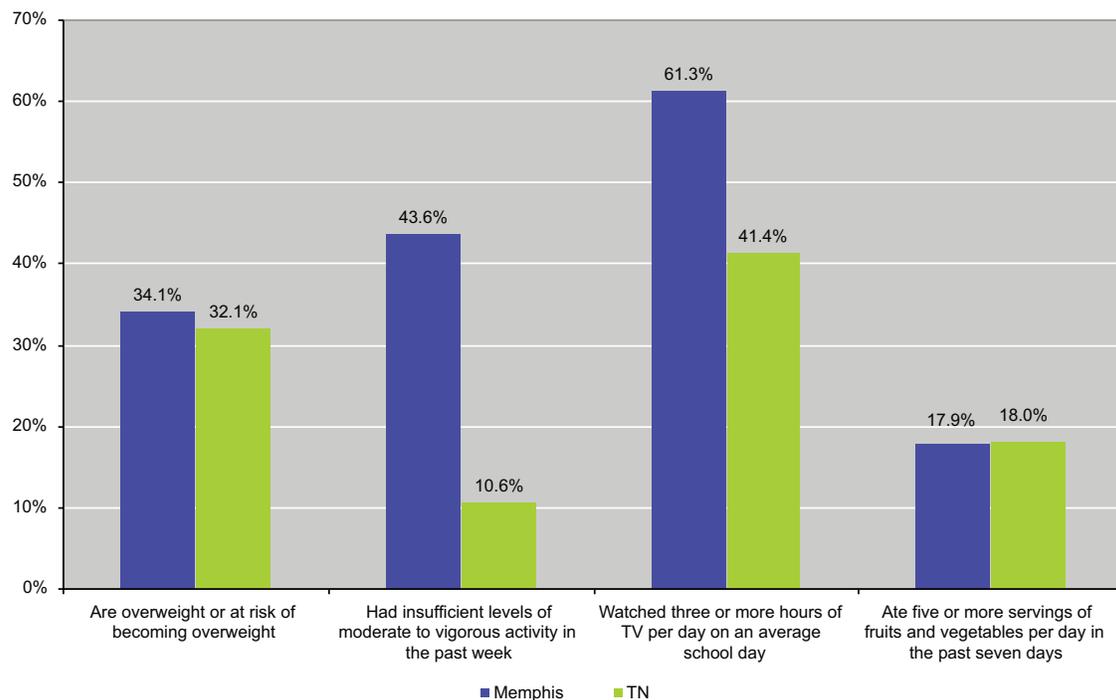
Using data from the 2005 YRBS, in which students reported their weight and height, 18 percent of MCS high school students would have a body mass index (BMI) in the “at-risk for overweight” category and 16 percent in the “overweight” category. These percentages are consistent with the State of Tennessee, 18 percent and 15 percent respectively, but higher than national percentages (13.1% and 15.7%).

More than 40 percent of MCS high school students reported inadequate levels of physical activity. That is four times the rate of students statewide.

This is important because many experts consider physical activity to be a cornerstone of prevention and/or management of childhood obesity and the associated health consequences. Physical activity has been shown to promote fat-loss, increasing energy expenditure, improving the metabolic profile, while at the same time improving psychological well-being. Physical activity also is associated with other health benefits, including a reduced risk of early death, coronary heart disease, hypertension, colon cancer, diabetes mellitus, depression and anxiety. Physical activity is also associated with an enhanced ability to perform daily tasks.

Sedentary behaviors, particularly television viewing, also have been implicated strongly in our childhood obesity epidemic. More than 60 percent of MCS students reported viewing three or more hours of TV on an average school day. Research has shown black and Hispanic children and adolescents tend to participate in even fewer vigorous activities and/or more sedentary activities than whites, with differences noted as early as elementary school. (*Institute of Medicine. Preventing Childhood Obesity: Health in the Balance. 2005*) This may explain the higher numbers reported by Memphis students than students statewide.

Weight, Nutrition and Physical Activity in Memphis and Tennessee, 2005



Source: Youth Behavioral Risk Surveillance Survey, 2005

MCS students demonstrate poor eating habits.

Less than 20 percent of MCS students or students statewide reported eating more than five servings of fruits and vegetables per day. Although this may seem to be a minor issue, it likely has significant public health implications.

Fruits and vegetables contain essential vitamins, minerals and fiber that may provide up to 20 percent protection against heart disease, stroke and cancer. It has been estimated that diet might contribute to the development of one-third of all cancers, and that increasing fruit and vegetable consumption is the second most important cancer prevention strategy, after reducing smoking. In addition, eating fruit and vegetables can help achieve other dietary goals including increasing fiber intake, reducing fat intake and helping to maintain a healthy weight. (*Dietary Guidelines for Americans, 2005*)

Some fruits and vegetables are also good sources of folate (e.g. green leafy vegetables and oranges). All women of child-bearing age are recommended to increase their consumption of foods naturally rich in folate and foods fortified with folic acid to prevent the development of spinal tube defects. (*March of Dimes. http://www.marchofdimes.com/pnhec/173_769.asp*)

Shelby County students' sexual activity leads to a variety of problems.

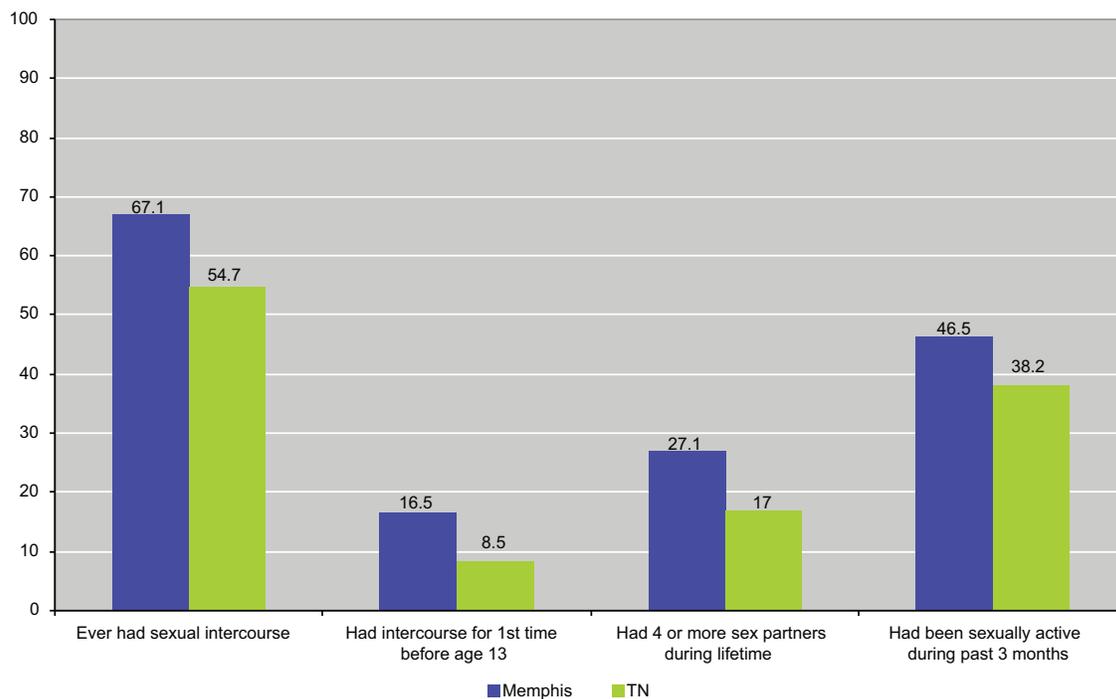
High school students in Memphis and Shelby County report being more active sexually than their counterparts across Tennessee. Also a higher percentage report first intercourse before age 13 and having sex with multiple partners. The negative consequences of teen sexual activity can be seen in the high rate of sexually transmitted diseases, pregnancy and early parenting among adolescents in the City of Memphis.

Studies suggest that parental, developmental and peer influences contribute to the early initiation of sexual activity. These include living in a single-parent home, the influence of an older sibling, the perception that peers are sexually active, early pubertal development, deviant peer groups, sexual abuse and alcohol and drug use. (*Alan Guttmacher Institute. Family Planning Perspectives. 2001; 33*)

Many adolescents in Memphis and Shelby County are exposed to one or more of these risks.

Chlamydia is the most frequently reported bacterial, sexually transmitted disease in the United States. In 2005 more than 975,000 chlamydial infections (332.5 cases per 100,000) across all age groups were reported to CDC from the 50 states and District of Columbia. Under-reporting is substantial because most people with chlamydia are not aware of their infections and do not

Sexual Activity by Adolescents in Memphis and Tennessee, 2005



Source: Youth Behavioral Risk Surveillance Survey, 2005

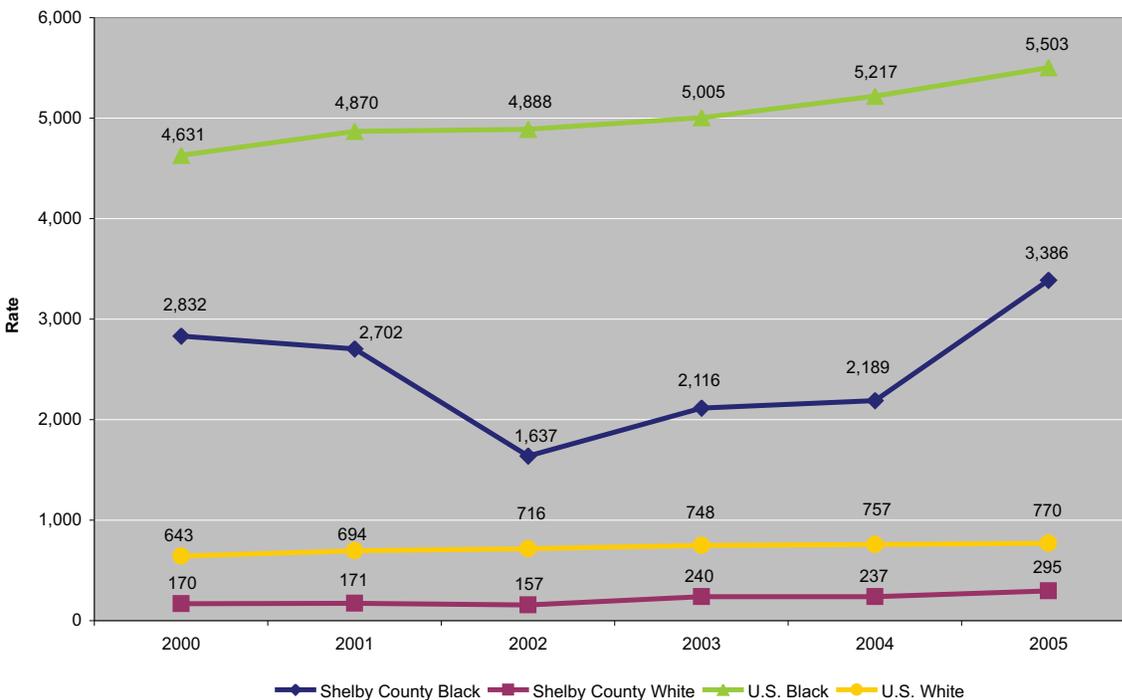
seek testing. Also testing is not often performed if patients are treated for their symptoms. An estimated 2.8 million Americans are infected with chlamydia each year.

Women frequently are re-infected if their sex partners are not treated. Chlamydia can be transmitted during vaginal, anal or oral sex. Chlamydia can also be passed from an infected mother to her baby during vaginal childbirth. In pregnant women there is some evidence that untreated chlamydial infections can lead to premature delivery. Babies who are born to infected mothers can get chlamydial infections in their eyes and respiratory tracts. Chlamydia is a leading cause of early infant pneumonia and conjunctivitis (pink eye) in newborns.

Any sexually active person can be infected with chlamydia. The greater the number of sex partners, the greater the risk of infection. Because the cervix (opening to the uterus) of teenage girls and young women is not fully matured, they are at particularly high risk for infection if sexually active. (<http://www.cdc.gov/std/stats/chlamydia.htm>).

- Tennessee ranks eighth among the 50 states for the reported rate of Chlamydia.
- Shelby County has one of the highest rates in the state.
- The number of cases of Chlamydia reported in 15-to-19-year-olds in Shelby County doubled between 1994 and 2004 and continues to rise, especially among black teens.
- The number of cases reported among white 15-to-19-year-olds, has remained relatively low.

Rates of Chlamydia in 15-19 Year Olds by Race in Shelby County and U.S., 2000-2005



Source: Tennessee Department of Health

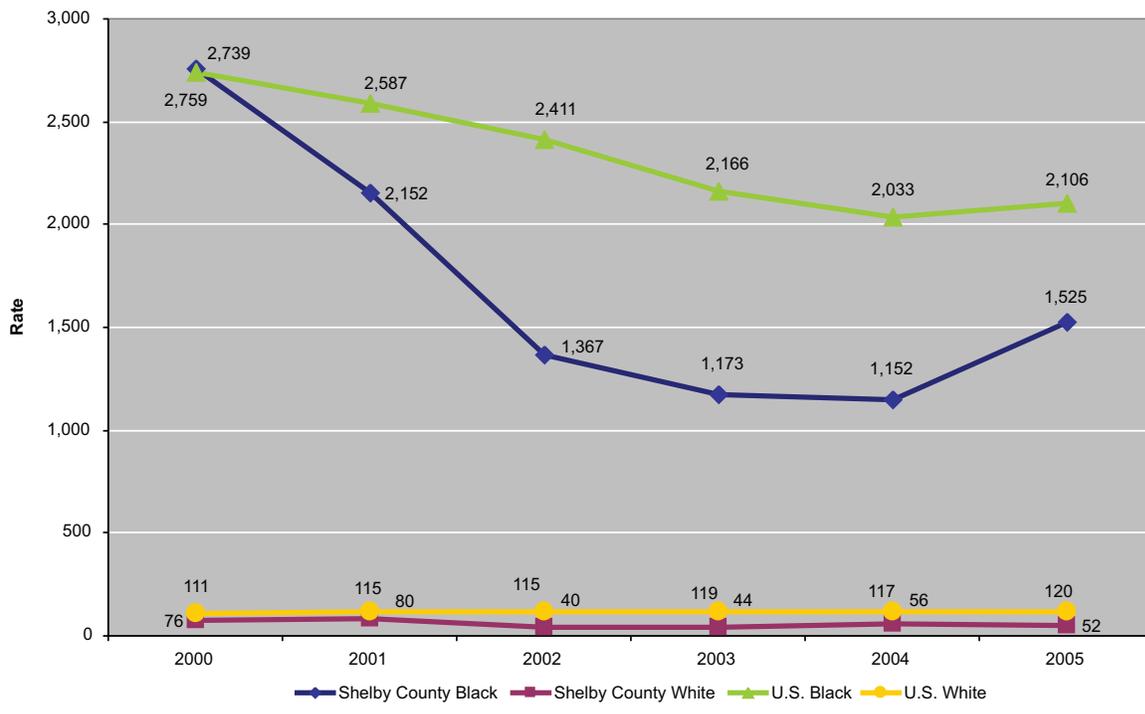
It must be stressed that these are “reported” cases, and actual numbers may be masked by changes in screening practices, use of diagnostic tests with differing test performance and changes in reporting practices.

Gonorrhea remains a very common infectious disease. CDC estimates that more than 700,000 persons in the U.S. are infected anew with gonorrhea each year. Only about half of these infections are reported to CDC. In 2005 339,593 cases (all age groups) were reported to the CDC. Untreated gonorrhea can cause serious and permanent health problems in both women and men.

In women gonorrhea is a common cause of pelvic inflammatory disease (PID). PID can damage the fallopian tubes enough to cause infertility or increase the risk of ectopic pregnancy. Ectopic pregnancy is a life-threatening condition in which a fertilized egg grows outside the uterus, usually in a fallopian tube. In men, gonorrhea can cause epididymitis, a painful condition of the testicles that can lead to infertility if left untreated. Gonorrhea can spread to the blood or joints. This condition can be life threatening.

In addition, people with gonorrhea are more likely to contract HIV, the virus that causes AIDS. HIV-infected people with gonorrhea are more likely to transmit HIV to someone else. If a pregnant woman has gonorrhea, she may give the infection to her baby as the baby passes through the birth canal during delivery. This can cause blindness, joint infection or a life-threatening blood infection in the baby. (<http://www.cdc.gov/std/Gonorrhea/STDFact-gonorrhea.htm#what>)

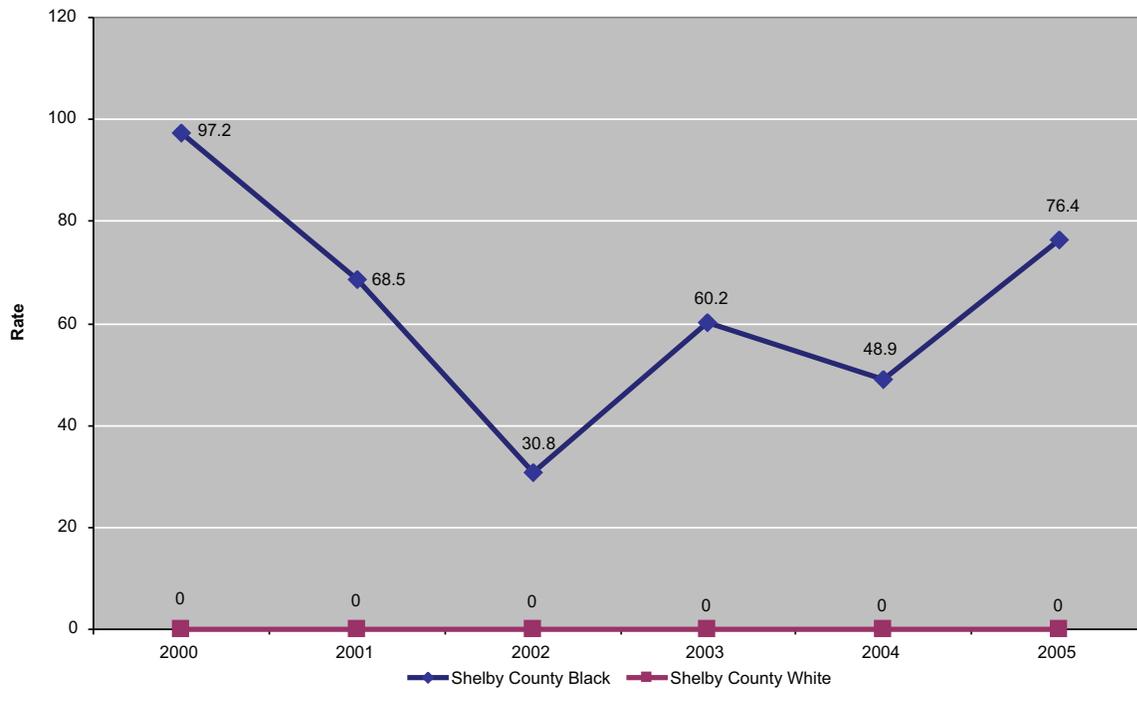
Rates of Gonorrhea in 15-19 Year Olds by Race in Shelby County and U.S., 2000-2005



Source: Tennessee Department of Health

The number of reported cases of gonorrhea in 15-to-19-year-olds in Shelby County has declined sharply over the past decade, with a slight increase between 2004 and 2005. It is too early to tell if this increase is just a normal variation or the beginning of a real increase in reported cases. As Chlamydia, only “reported” cases have been captured. The true incidence is higher and remains unknown.

Rates of HIV/AIDS in 15-19 Year Olds by Race in Shelby County, 2000-2005



Source: Shelby County Health Department

Young people in the United States are at persistent risk for HIV infection. This risk is especially notable for youth of minority races and ethnicities.

- Black persons accounted for 55 percent of all HIV infections reported among persons aged 13–24 in 2004. (<http://www.cdc.gov/hiv/resources/factsheets/youth.htm>)
- In Shelby County there were 32 cases of HIV/AIDS reported among 15-to-19-year-olds in 2005. This represents a rate of 76.4 cases per 100,000.
- National comparison data for this age group were not available, however the reported rates for black and white adults and adolescents 13 years and older were 97.2 and 10.7 per 100,000, respectively. (<http://www.cdc.gov/hiv/topics/surveillance/resources/reports/2005report/table5b.htm>)