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Comptroller of the Treasury
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*OREA*

# MOTHERS AND BABIES: THE HEALTH OF TENNESSEE'S FUTURE

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# MOTHERS AND BABIES: THE HEALTH OF TENNESSEE'S FUTURE

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# EXECUTIVE SUMMARY

In 2004, nine of every 1,000 babies born alive in Tennessee died before their first birthday, a rate higher than every other state in the nation except Louisiana and Mississippi. The rates are even higher for black infants: 17 of every 1,000 die before age one. Improvements in the medical care of pregnant women and newborn infants drastically reduced the absolute infant mortality rate in the United States from 26.0 to 6.63 per 1,000 live births between 1960 and 2005. However, Tennessee has the third highest infant mortality rate in the nation and the fifth highest preterm birth and low birth weight rates. The long-term tangible effects of poor birth outcomes have high economic and social costs, borne by the state and its citizens.

In Tennessee there are
*Geographic differences in birth outcomes and access to prenatal care:*

- Infant mortality is more prevalent in the west health region, but the rate is increasing statewide.
- Low weight births are increasing statewide and correlate to infant deaths.
- Between 1998 and 2003, the percent of women receiving adequate prenatal care ranged from an average of 53 percent in Stewart County to 93 percent in Williamson County.

*…And racial differences in birth outcomes and access to prenatal care:*

- The absolute infant mortality rate is over two times higher for infants born to black women than those born to white women.
- A higher percent of black infants are born preterm.
- A higher percent of black infants are born with low birth weight.
- A lower percent of black women receive adequate prenatal care.

This report examines the structural and social issues influencing newborn health in Tennessee and reaches the following conclusions:

- **Poor maternal health affects infant health, leading to long-term health issues with high costs for Tennessee.** The state ranks 48th in the country in infant mortality, and 46th in low weight births and preterm births. In 2004, Tennessee ranked 48$^{th}$ in overall health and 42$^{nd}$ in women's overall health. Poor maternal health is a leading contributor to the birth of unhealthy babies in Tennessee. Because of recent medical advancements, low birth weight and preterm infants who would have died are now surviving, yet sustaining lifelong health problems and developmental delays. These conditions increase medical expenses: in 2002, the total charges associated with low weight births alone were estimated to be $160 million dollars. These conditions also increase education spending: children born prematurely or low birth weight are more likely than their peers to have mild learning disabilities, attention disorders, and developmental impairments, and therefore are more likely to require special education services. (pages 17-20)

- **Tennessee's maternal and infant health care system appears to lack human, financial and structural resources**. In 2003, fifteen of Tennessee's 95 counties reported having no obstetric provider. In addition, the state receives less money through the federal Maternal and Child Health Title V Block Grant than any other state in our health region except Mississippi. Although females of child-bearing age (10-44 years of age) comprise 25 percent of Tennessee's total population, and poor maternal health is a leading contributor to poor birth outcomes in Tennessee, neither the Maternal and Child Health Section nor the Office of Women's Health allocates sufficient resources to services for this group: the MCH Section chooses to allocate only 6.4 percent of its Title V funding to services for pregnant women, and the Office of Women's Health has not been funded or sufficiently staffed since its inception in 2000.

In addition, Tennessee allocates less than both the national and regional averages to building program infrastructure (i.e., needs assessment, monitoring and evaluation, planning, policy development, training, research and information/data systems). Perhaps for this reason, the MCH Section's priorities have not focused on improving poor birth outcomes, nor has the MCH Section recently evaluated or produced any annual reports on home-visiting programs in Tennessee.

**Tennessee has applied for but not received federal grants that would allow the state to monitor maternal experiences and birth outcomes because the state has not invested in adequate MCH data collection systems.** According to a 2001 federal review of a Tennessee grant application for the Pregnancy Risk Assessment Monitoring System the MCH Section has little experience in linking complicated datasets and MCH programs lack coordination. (pages 21-35)

Legislative Recommendations (pages 36-37)
The General Assembly may wish to create an Obstetrical Care Task Force modeled after Virginia's Governor's Work Group on Rural Obstetrical Care or Delaware's Infant Mortality Task Force to discuss potential strategies for protecting the availability of health care services in rural areas and for low-income residents.

The General Assembly may wish to consider additional funding for the Office of Women's Health.

Administrative Recommendations (pages 37-39)
The Tennessee MCH Section should make the reduction of infant mortality and low birth weight rates priorities and carry out relevant program activities with these priorities in mind.

The Department of Health should enhance data collection relevant to maternal and infant health.

The Maternal and Child Health Division should consider formally working with both the Office of Rural Health and the Office of Disparity Elimination, to assess the geographic availability and distribution of women's health and maternal and infant health services and use the information to better assess maternal and child health needs.

The Department of Health should reconsider its allocation of resources for programs and services for women of reproductive age.

The Department of Health should place greater emphasis on building the infrastructure of MCH programs. MCH infrastructure includes monitoring and evaluation, needs assessments, planning, policy development, and information/data systems

The Department of Health should consider increasing the grant-writing expertise of its divisions, as they have been unsuccessful in securing some key federal funds.

The Department of Health should consider monitoring its Maternal and Child Health programs using more innovative State Performance Measures to address the reduction of infant mortality, low weight and preterm births in Tennessee. These might include tracking the extent to which perinatal health disparities are addressed at the state and local levels and the percentage of women of childbearing age who receive preconception care in local health departments.

The Bureau of TennCare may wish to include coverage of smoking cessation services as part of the core set of benefits offered to all pregnant women because smoking during pregnancy leads to adverse pregnancy and birth outcomes.

The Commissioner of Health responded to this report. See Appendix VIII beginning on page 53.

# CONTENTS

**EXECUTIVE SUMMARY** ..... I

**INTRODUCTION** ..... 1

**DEFINITIONS OF POOR BIRTH OUTCOMES** ..... 3

**BACKGROUND** ..... 4

THE SOCIAL AND BIOLOGICAL CAUSES OF POOR BIRTH OUTCOMES ..... 4
THE GEOGRAPHIC AND RACIAL DISPARITIES IN BIRTH OUTCOMES ..... 5
STATE SERVICES TO PREGNANT WOMEN AND INFANTS IN TENNESSEE ..... 9

**CONCLUSION 1: POOR MATERNAL HEALTH AFFECTS INFANT HEALTH, LEADING TO LONG-TERM HEALTH ISSUES WITH HIGH COSTS FOR TENNESSEE** ..... 17

TENNESSEE RANKS 48TH IN THE COUNTRY IN INFANT MORTALITY, 46TH IN LOW BIRTH WEIGHT BIRTHS, AND 46TH IN PRETERM BIRTHS ..... 17
POOR BIRTH OUTCOMES INCREASE HEALTH SPENDING ..... 19
POOR BIRTH OUTCOMES INCREASE EDUCATION SPENDING ..... 20

**CONCLUSION 2: TENNESSEE'S MATERNAL AND INFANT HEALTH CARE SYSTEM APPEARS TO LACK HUMAN, FINANCIAL AND STRUCTURAL RESOURCES** ..... 21

IN 2003, 15 OF TENNESSEE'S 95 COUNTIES REPORTED HAVING NO OBSTETRIC PROVIDER. ..... 21
TENNESSEE DOES NOT ADDRESS ALL MCH POPULATIONS EQUALLY WITH AVAILABLE LIMITED RESOURCES. ..... 24
TENNESSEE LACKS A BROAD-BASED, LONG-TERM FOCUS ON REDUCING POOR BIRTH OUTCOMES ..... 26
TENNESSEE DOES NOT HAVE ADEQUATE MCH DATA COLLECTION SYSTEMS ..... 33

**RECOMMENDATIONS** ..... 36

**APPENDICES** ..... 40

APPENDIX I: TENNESSEE HEALTH REGIONS ..... 41
APPENDIX II: BIRTH OUTCOMES RANK AMONG 50 LARGEST U.S. CITIES AND 50 STATES, 2002 ..... 42
APPENDIX III: HOSPITALS PARTICIPATING IN PERINATAL REGIONALIZATION SYSTEM ..... 43
APPENDIX IV: COMMUNITY INITIATIVE GRANT RECIPIENTS ..... 44
APPENDIX V: PERINATAL PERIODS OF RISK (PPOR): A TOOL FOR PRIORITIZING PREVENTION ACTIVITIES ..... 45
APPENDIX VI: TITLE V NATIONAL PERFORMANCE MEASURES ..... 48
APPENDIX VII: PEOPLE INTERVIEWED FOR THIS REPORT ..... 50
APPENDIX VIII: RESPONSE LETTER FROM COMMISSIONER OF HEALTH ..... 53
APPENDIX IX: ADDENDUM TO LETTER FROM COMMISSIONER OF HEALTH ..... 58

**ENDNOTES** ..... 66

**EXHIBITS**

Exhibit 1: Tennessee Rural and Metropolitan Health Regions ..... 5
Exhibit 2: Metro Health Regions' Average Infant Mortality Rates (infant deaths per 1,000 live births) and Trends, 1995-2004 ..... 6
Exhibit 3: Rural Health Regions' Average Infant Mortality Rates (infant deaths per 1,000 live births) and Trends, 1995-2004 ..... 6
Exhibit 4: Metro Health Regions' Percents and Trends of Low Birthweight Births, 1995-2004 ..... 6
Exhibit 5: Rural Health Regions' Percents and Trends of Low Birthweight Births, 1995-2004 ..... 7
Exhibit 6: Tennessee's Birth Outcomes Rankings, by Race ..... 8
Exhibit 7: Potential Benefits of Nurse Home-Visiting Programs ..... 11
Exhibit 8: Tennessee Home Visiting Programs ..... 12

Exhibit 9: Shortage Area Definitions ..... 14
Exhibit 10: Top 30 Health Resource Shortage Areas for Obstetrics, 2003 ..... 15
Exhibit 11: Tennessee Programs for Teen Parents ..... 15
Exhibit 12: Tennessee's Birth Outcomes Rankings ..... 17
Exhibit 13: Tennessee's Maternal Health Indicator Rankings, 2002 ..... 17
Exhibit 14: State Volunteer Mutual Insurance Company, Tennessee Physician Premiums, 1995-2005 ..... 23
Exhibit 15: Average Charges and Reimbursements for Obstetricians in Tennessee ..... 23
Exhibit 16: Region IV Federal-State Partnership Budgets, in Total Dollars, FY 2005 ..... 24
Exhibit 17: Percent of Total Federal-State Partnership Funds Allocated to Services for Pregnant Women, FY 2005 ..... 25
Exhibit 18: Examples of Service Category Components in Tennessee Title V Programs ..... 26
Exhibit 19: Core Public Health Services Delivered by MCH Agencies ..... 27
Exhibit 20: Federal-State Title V Block Grant Expenditures for Infrastructure, FY 2004 ..... 28
Exhibit 21: List of State Priorities and Performance Measures for 2000-2005 ..... 29
Exhibit 22: List of State Priorities/Performance Measures for 2005-2010 ..... 31
Exhibit 23: Tennessee Counties with Home Visiting Services ..... 32

# INTRODUCTION

## Poor birth outcomes signal the social morbidity of a society, and medical advancements alone are not the remedy.

In 2004, nine of every 1,000 babies born alive in Tennessee died before their first birthday, a rate higher than every other state in the nation except Louisiana and Mississippi. The rates are even higher for black infants: 17 of every 1,000 die before age one. Improvements in the medical care of pregnant women and newborn infants drastically reduced the absolute infant mortality rate in the United States from 26.0 to 6.63 per 1,000 live births between 1960 and 2005. However, Tennessee has the third highest infant mortality rate in the nation and the fifth highest preterm birth and low birth weight rates. The long-term tangible effects of poor birth outcomes have high economic and social costs, borne by the state and its citizens.

**Why are so many of Tennessee's infants dying?**

Broad racial and economic disparities greatly affect health outcomes for babies. Poor birth outcomes serve as a mirror, reflecting the influence of social and economic inequalities independent of medical technology.[1]
Nationally,

- Rates of infant mortality, preterm delivery, and low birth weight among black infants remain persistently higher than those of white infants.
- Neonatal mortality rates correlate to state-level economic inequality.
- Initiatives to improve women's pre-pregnancy health remain sparse.

As Marsden Wagner of the World Health Organization explains, such disparities in birth outcomes are perpetuated when social factors, such as formal and informal education, socioeconomic resources, and social support, are not addressed. Wagner compares infant mortality to traffic accident mortality in children:

> The first priority for improving traffic accident mortality in children is not to build more and better medical facilities, but rather to change traffic laws and better educate drivers and children. In other words, the solution is not primarily medical, but environmental, social and educational.
>
> The same is true for infant mortality: the first priority is not more obstetricians or pediatricians or hospitals, nor even more prenatal clinics or well-baby clinics, but rather to provide more social, financial and educational support to families with pregnant women and infants.[2]

***"Infant mortality is not a health problem. Infant mortality is a social problem with health consequences."***
*- Marsden Wagner, Statement to the National Commission to Prevent Infant Mortality*

Although access to prenatal care is important, many social factors influence a woman's health well before she is pregnant. Therefore, Tennessee will not likely improve its current level of infant health – in the bottom 10 percent nationally – unless the state reframes poor birth outcomes as a social problem with health consequences. Nor will Tennessee reduce the extra demands on resources to care for the surviving infants with lifelong health problems and developmental disabilities.

Efforts to further improve infant health should emphasize reduction in the racial, socioeconomic, and regional health disparities experienced by women in Tennessee. Greater numbers of healthy-born infants would signal the capacity and ability of Tennessee's public health care system and social infrastructure to support its citizens.

## *Report Objectives*

The Comptroller's Office of Research and Education Accountability staff examined the structural and social issues influencing infant health in Tennessee by asking the following questions:

- How do maternal and infant health indicators in Tennessee compare to the nation?
- Is the proportion of poor birth outcomes high in Tennessee, and if so, why?
- What state agencies provide maternal and infant health service delivery in Tennessee?
- How is maternal and infant health service delivery tracked in Tennessee?
- What can state and local agencies do to reduce preventable poor birth outcomes?

## *Methodology*

This report's conclusions and recommendations are based on:

- A review of relevant state and federal laws, policies, and regulations
- Interviews with key staff of state and local agencies and organizations
- A review of research and data from the following sources:

**Tennessee State Government**
- Department of Health
- Department of Commerce and Insurance
- Bureau of TennCare
- Commission on Children and Youth
- Department of Human Services
- Department of Education
- Tennessee Early Intervention System
- Upper Cumberland Primary Care Project
- Regional Health Departments

**Local Government**
- Metropolitan Public Health Department of Nashville and Davidson County
- Memphis-Shelby County Health Department
- Shelby County Mayor's Office

**Federal Government**
- Department of Health and Human Services
- Census Bureau
- Centers for Disease Control and Prevention
- National Institutes of Health
- Government Accountability Office

**Local Organizations**
- Tennessee Hospital Association
- Tennessee Primary Care Association
- Hospital Alliance of Tennessee
- Tennessee Medical Association
- State Volunteer Mutual Insurance Company
- Maternal Infant Health Outreach Worker Program

**Clinicians and Academicians**
- Vanderbilt University Medical Center
- University of Tennessee Health Science Center
- The University of Memphis
- The Cecil G. Sheps Center for Health Services Research at the University of North Carolina

**National Organizations**
- American College of Obstetrics and Gynecology
- American Academy of Pediatrics
- American Medical Association

- Association of State and Territorial Health Officials
- March of Dimes
- National Conference of State Legislatures
- National Commission to Prevent Infant Mortality
- Southern Regional Task Force on Infant Mortality
- The Henry J. Kaiser Family Foundation
- Institute of Medicine
- The Annie E. Casey Foundation
- The Robert Wood Johnson Foundation

# DEFINITIONS OF POOR BIRTH OUTCOMES

For the purposes of this report, poor birth outcomes include infant mortality, preterm delivery, and low birth weight. They are defined as follows:

**Infant Mortality Rate =**

$$\frac{\text{Number of infant deaths} < 1 \text{ year}}{\text{Number of live births}} \times 1{,}000 \text{ births}$$

**Neonatal Mortality Rate =**

$$\frac{\text{Number of infant deaths} < 28 \text{ days}}{\text{Number of live births}} \times 1{,}000 \text{ births}$$

**Preterm Delivery =** birth of an infant before 37 completed weeks of gestation
(the birth of an infant between 37 and 42 weeks of gestation is considered full-term)

**Low Birth Weight (LBW) =** < 2,500 grams = < 5 ½ pounds

**Very Low Birth Weight (VLBW) =** <1,500 grams = < 3 1/3 pounds

# BACKGROUND

## The social and biological causes of poor birth outcomes

Infant mortality, preterm birth, and low birth weight can be caused by a myriad of social and medical problems, some of which overlap. About 66 percent of LBW babies are preterm, about 50 percent of preterm babies are LBW,[3] and 65.5 percent of infant deaths in Tennessee in 2002 were associated with LBW. [4]

The following sections describe risk factors and leading causes of poor birth outcomes.

### *Infant Mortality*

The three leading causes of infant mortality are:

- Disorders related to preterm birth and low birth weight
- Birth defects
- Sudden Infant Death Syndrome (SIDS).[a]

Of all children under the age of 17 who died in Tennessee in 2002, 31 percent were infants born prematurely.[5] Low birth weight infants comprised 65.5 percent of all infant deaths in 2002,[6] and low birth weight was the primary identifiable cause of 22.6 percent of all infant deaths.[7] Low birth weight is the leading cause of death among black infants. Birth defects are the leading cause of death among white infants.[8] Infants also die because of maternal pregnancy complications, fetal infection, and accidents.

### *Preterm Delivery*

One in four preterm births results from medical intervention, such as inducing labor in response to a maternal or fetal complication. The remaining three of four preterm births are spontaneous, many resulting from unknown causes.

Previous preterm birth and current multifetal pregnancy (twins, triplets, etc.) are the two most commonly recognized risk factors for preterm delivery. Demographic risk factors include African American race, maternal age younger than 17 or older than 35, and low socio-economic status. [9]

Other triggers of spontaneous preterm delivery, many of which are more prevalent among socially disadvantaged and minority women are medical, behavioral and environmental.

**Medical Risk Factors**

- Maternal high blood pressure
- Diabetes
- Short inter-pregnancy interval
- Inadequate fetal nutrition or oxygenation[10]
- Inadequate nutrition or obesity
- Gum disease

**Behavioral & Environmental Risk Factors**

- Lack of preconception care
- Late or no prenatal care
- Smoking or alcohol use
- Maternal stress
- Work that requires long periods of standing
- Folic acid deficiency

[a] Infant risk factors for SIDS include sleeping face down, prematurity, low birth weight, overheating, and co-sleeping. Maternal risk factors include smoking during pregnancy and the infant's first year of life, alcohol use during pregnancy, late or no prenatal care, maternal age <20.

### *Low Birth Weight*

Low birth weight (LBW) can result from preterm delivery or inhibited growth during a full-term pregnancy. Cigarette smoking during pregnancy, low maternal weight gain, and low pre-pregnancy weight all inhibit fetal growth.

Birth weight is also "affected to a great extent by the mother's own fetal growth;" [11] a mother who was a LBW infant is more likely to have a LBW infant. Other risk factors include maternal hypertension, heart disease, sickle cell disease, sexually transmitted diseases, inadequate prenatal care, and the indirect factors related to physical, sexual or emotional abuse[12] during pregnancy (i.e., abused pregnant women are more likely to use nicotine, alcohol, and drugs).

## The geographic and racial disparities in birth outcomes

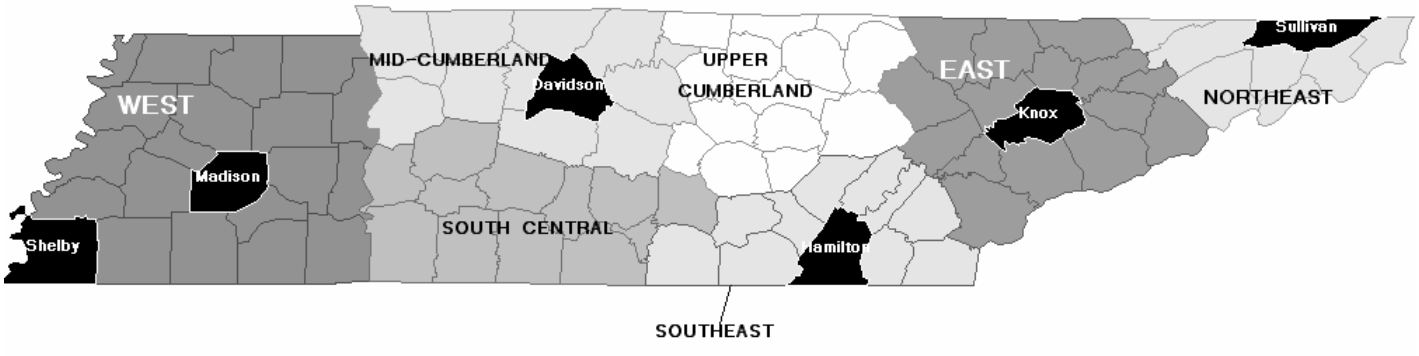
The Office of Disparity Elimination in the Tennessee Department of Health has identified infant mortality and prenatal care as two of six disparity elimination priority areas. While this is an accurate acknowledgement, infant mortality and prenatal care are only two of the many disparity areas for which health-specific policy and programming are necessary but insufficient to impact the rate of poor birth outcomes in Tennessee.

The following data indicates that Tennessee will not likely reduce its high infant mortality rate unless the state makes a concerted effort to reduce the number of LBW and preterm births. To reduce the number of LBW and preterm births Tennessee will need "a broad and intensive strategy" to address the socioeconomic inequality, concentrated poverty, inequitable and segregated housing and education, individual risk behaviors and disparate access to medical care that are linked to maternal and infant health.[13]

### *Birth Outcomes Vary by City, County, and Region*

The Tennessee Department of Health (TDOH) is the main state entity responsible for maternal and infant service and program delivery. TDOH groups the 95 counties into seven rural and six metropolitan health regions (see Appendix I for counties in each region).

**Exhibit 1: Tennessee Rural and Metropolitan Health Regions**




When analyzed by health region, the following birth outcome trends emerge.

**Infant mortality is more prevalent in the west region, but the rate is increasing statewide.** [b] Of the state's metro health regions, Shelby County has the highest average infant mortality rate; Knox County has the lowest. However, the rate is increasing most rapidly in Madison County. The infant mortality rate in Madison County increased 5.2 percent annually from 1995-2004, while the rate decreased 3.4 percent annually in Knox County.

**Exhibit 2: Metro Health Regions' Average Infant Mortality Rates (infant deaths per 1000 live births) and Trends, 1995-2004**

| | Average Infant Mortality Rate |
|---|---|
| **Shelby** | 13.2 |
| **Madison** | 10.2 |
| **Hamilton** | 9.4 |
| **Sullivan** | 8.8 |
| **Davidson** | 8.7 |
| **Knox** | 6.1 |

| | Average Change in Infant Mortality Rate |
|---|---|
| **Madison** | 5.2% |
| **Hamilton** | 1.0% |
| **Shelby** | 1.0% |
| **Davidson** | 0.7% |
| **Sullivan** | -0.1% |
| **Knox** | -3.4% |

Of the rural health regions, the West has the highest average infant mortality rate, and the Mid-Cumberland has the lowest. However, the rate is increasing most rapidly in the Northeast and West Regions. The infant mortality rate in the Northeast increased 5.5 percent annually from 1995-2004.

**Exhibit 3: Rural Health Regions' Average Infant Mortality Rates (infant deaths per 1000 live births) and Trends, 1995-2004**

| | Average Infant Mortality Rate |
|---|---|
| **West** | 10.5 |
| **Northeast** | 7.8 |
| **South Central** | 7.5 |
| **Upper Cumberland** | 7.0 |
| **Southeast** | 6.6 |
| **East** | 6.3 |
| **Mid-Cumberland** | 6.2 |

| | Average Change in Infant Mortality Rate |
|---|---|
| **Northeast** | 5.5% |
| **West** | 2.8% |
| **South Central** | 1.8% |
| **Upper Cumberland** | 1.6% |
| **East** | 0.8% |
| **Southeast** | 0.5% |
| **Mid-Cumberland** | -0.4% |

**Low weight births are increasing statewide and correlate to infant deaths.** Of the state's metro health regions, Shelby County has the highest percent of low weight births; Knox County has the lowest. However, the percent is increasing most rapidly in Hamilton County. Low weight births in Hamilton County increased 3.1 percent annually from 1995-2004.

**Exhibit 4: Metro Health Regions' Percents and Trends of Low Birthweight Births, 1995-2004**

| | Average Percent of LBW Births |
|---|---|
| **Shelby** | 11.2% |
| **Hamilton** | 10.8% |
| **Madison** | 9.6% |
| **Davidson** | 9.4% |
| **Sullivan** | 8.7% |
| **Knox** | 8.6% |

| | Average Change in LBW Births |
|---|---|
| **Hamilton** | 3.1% |
| **Madison** | 1.5% |
| **Sullivan** | 1.2% |
| **Shelby** | 0.4% |
| **Knox** | 0.1% |
| **Davidson** | -0.1% |

[b] Rates based on a small number of events can fluctuate widely from year to year for reasons other than a true change in frequency. Therefore, OREA calculations for infant mortality and low birthweight presented in Exhibits 2-5 are by health region, rather than for individual counties, and are based on Three Year Moving Averages, which provide a more stable measure of rates over time. Instead of calculating a rate or percent based on the number of births in a county in one year, the rate is calculated based on the number of births in a health region over three years.

OREA used the following three year periods to analyze birth outcome trends over 10 years: 1995-97, 1996-98, 1997-99, 1998-2000, 1999-2001, 2000-02, 2001-03, and 2002-04. Raw data supplied by the Department of Health's Office of Policy, Planning and Assessment data supplied by the Department of Health's Office of Policy, Planning and Assessment.

Of the rural health regions, the West has the highest percent of low weight births, and the Mid-Cumberland has the lowest. However, the percent is increasing most rapidly in the Upper Cumberland Region. Low weight births in the Upper Cumberland Region increased three percent annually from 1995-2004.

**Exhibit 5: Rural Health Regions' Percents and Trends of Low Birthweight Births, 1995-2004**

| | Average Percent of LBW Births |
|---|---|
| **West** | 9.3% |
| **Southeast** | 8.8% |
| **South Central** | 8.3% |
| **Northeast** | 8.3% |
| **East** | 8.3% |
| **Upper Cumberland** | 7.9% |
| **Mid-Cumberland** | 7.8% |

| | Average Change in LBW Births |
|---|---|
| **Upper Cumberland** | 3.0% |
| **Northeast** | 2.4% |
| **West** | 1.9% |
| **Southeast** | 1.5% |
| **East** | 1.2% |
| **Mid-Cumberland** | 1.1% |
| **South Central** | -0.3% |

Although the percent increase in low weight births may appear small, it is a concern because of the link to infant mortality, the developmental consequences for those who survive, and the associated high social and financial costs.

Of the nation's 50 largest cities, Memphis has the highest infant mortality rate and the fifth highest percent of LBW births. The Memphis experience illustrates the importance of reframing poor birth outcomes as a social problem with health consequences and reframing maternal and child health as an issue of women's health regardless of pregnancy status.

### *Spotlight on Memphis: Birth Outcomes and Socio-Economic Status*

**Birth Outcomes Facts and Figures[14]**

- An infant dies in Shelby County every 43 hours.
- An African American mother in Memphis is almost three times more likely to lose a baby before age one than a white mother.

**Memphis Ranks at Bottom among the 50 Largest U.S. Cities, 2002 (Appendix II)[15]**

- 50th in percent of births to teens who were already mothers.
- 49th in percent of women receiving late or no prenatal care.
- 47th in percent preterm births.
- 45th in percent low birth weight.
- 45th in percent of births to unmarried women.
- 45th in total births to teens
- 30th in percent of births to mothers with less than 12 years of education.
- 22nd in percent of births to mothers who smoked during pregnancy.

**Indicators of Child Well-Being for Memphis, 2000[16]**

- 30% of children live in poverty
- 53% of children live in single-parent families
- 47% of children live in families where no parent has full-time, year-round employment
- 25% of children live with a household head who is a high school dropout
- 14% of teens are high school dropouts
- 13% of teens are not attending school and not working

**Adequacy[c] of prenatal care is not simply a rural-urban disparity.** For example, the percentage of women receiving adequate prenatal care from 1998-2003 ranged from an average of 53 percent in Stewart County to 93 percent in Williamson County. In 2003, only 49 percent of women in Franklin County received adequate prenatal care.

However, there is disparity within metropolitan areas as well. For example, an average of 82 percent of women in Davidson County and 81percent of women in Knox County receive adequate prenatal care, versus 65 percent in Shelby County and 69 percent in Sullivan County.

## *Birth Outcomes Vary by Race*

The following data focus on African American/white birth outcome disparities. However, it will be important to address Hispanic birth trends as this population grows in Tennessee. Interestingly, infant mortality rates among Hispanics are affected negatively by length of residence in the United States. Although the first generation exhibits rates close to those of whites, subsequent generations have higher rates, closer to those of African Americans.[17]

In Tennessee, poor birth outcomes are more common among African American women and infants than among white women and infants. This translates into higher infant mortality rates for specific causes, such as LBW, preterm birth, and extremely preterm birth for African American women. For example, infant mortality rate caused by low birth weight is four times higher for African Americans than for whites.[18]

In Tennessee, between 1998 and 2004,

- The infant mortality rate for black babies was **2.59** times higher than for white babies[19,20]
- The low birth weight rate for black babies was **1.82** times higher than for white babies
- The very low birth weight rate for black babies was **2.53** times higher than for white babies
- The preterm birth rate[d] for black babies was **1.5** times higher than for white babies.[21]

This over-representation of poor birth outcomes among African American residents regularly ranks Tennessee among the bottom 10 states in infant health indicators by race.

**Exhibit 6: Tennessee's Birth Outcomes Rankings, by Race**

**African American**

| Indicator | 2000-2002 Average Rate | Ranking |
|---|---|---|
| Infant Mortality Rate | 17.0 | 49 |
| Neonatal Mortality Rate | 11.4 | 50 |
| Percent Low Birth Weight | 14.2 | 45 |
| Percent Very Low Birth Weight | 3.25 | 42 |

**White**

| Indicator | 2000-2002 Average Rate | Ranking |
|---|---|---|
| Infant Mortality Rate | 7 | 46 |
| Neonatal Mortality Rate | 4.3 | 43 |
| Percent Low Birth Weight | 7.95 | 47 |
| Percent Very Low Birth Weight | 1.3 | 43 |

*Source: Health, United States, 2004 with Chartbook on Trends in the Health of Americans, National Center for Health Statistics.*

[c] "Adequacy" of prenatal care is determined by the Department of Health using the Kessner Index, which measures timing of the first prenatal visit; total number of prenatal visits; and length of gestation. The Kessner Index categorizes prenatal care as adequate, intermediate or inadequate.
[d] Preterm birth rate data is for 1998 through 2003.

Healthy People 2010 is a national health promotion and disease prevention initiative. The health indicators and targets are intended to help states and communities develop programs to improve health.[e] Comparisons of Healthy People 2010 Maternal and Child Health objectives to current Tennessee rates by racial group identify opportunity gaps between the state's African American and white populations. It is both possible and advantageous for Tennessee to improve newborn vitality/infant health for African Americans.

**The absolute infant mortality rate is over two times higher for infants born to African American women than those born to white women.** Tennessee's overall infant mortality rate of 9.2 is more than twice the Healthy People 2010 target of 4.5. However, the rate among the African American population (18 deaths per 1,000 live births) is more than twice that of the white population (seven deaths per 1,000 live births) and four times higher than the Healthy People target.[22]

**A higher percent of African American infants are born preterm.** Tennessee's percent of preterm births (14.1 percent) is nearly twice the Healthy People 2010 target of 7.6 percent. Statewide in 2003, 18 percent of African American infants were born preterm and 13.2 percent of white infants were born preterm. The rate for African American infants is 36 percent higher than the rate for white infants and 2 ½ times higher than the federal target.[23]

**A higher percent of African American infants are born with LBW.** Tennessee's overall low birth weight rate of 9.4 is almost twice the Healthy People 2010 target of 5.0 percent. Just as with infant mortality and preterm births, LBW births are more common among the African American population. The low birth weight rate for infants born to African American women (14.9 percent) is nearly double the rate for infants born to white women (8.0 percent) and nearly triple the national target.[24]

**A lower percent of African American women receive adequate prenatal care.** Tennessee's total percent of women receiving adequate prenatal care (79.4 percent) is lower than the Healthy People 2010 target of 90 percent. Adequate Prenatal care is less common among African American women (68.6 percent) than among white women (82.4 percent).[25]

## State services to pregnant women and infants in Tennessee

The Tennessee Department of Health (TDOH) Maternal and Child Health Section (MCH) administers programs using a combination of state dollars and federal Title V Maternal and Child Health Services Block Grant funding (often referred to as "Title V"). The grant is intended to, among other things, provide all mothers and children access to quality MCH services; to reduce infant mortality and preventable diseases among children; to provide prenatal, delivery and postpartum care for low income, at-risk pregnant women; and to promote the health of low-income children by providing preventive and primary care services. [26]

The state provides the following services to pregnant women and infants, often through local health departments.

### *Presumptive Eligibility for TennCare*

Since 1989, all states have been required to offer Medicaid coverage to pregnant women with family incomes below 133 percent of the federal poverty level. States have the

[e] Among others, the Maternal and Child Health objectives include: reduce all infant deaths, reduce low birth weight births, reduce preterm births, increase maternal prenatal care during the first trimester, decrease smoking during pregnancy, and increase the number of infants sleeping on their backs.

option of setting higher limits.[27] In Tennessee, TennCare presumptive eligibility allows pregnant women with family incomes below 185 percent of the federal poverty level earlier access to prenatal care by granting them temporary Medicaid eligibility. Pregnant women are enrolled in a managed care organization (MCO) while their formal Medicaid application is processed by the Department of Human Services. Pregnant women continue to be eligible for TennCare up to 2 months after they give birth.

## *Prenatal Care*

Prenatal care combines medical attention, advice, education, and counseling. Pregnant women receive from obstetric care providers information on issues such as nutrition, physical activity, maternal behaviors, and basic parenting skills. [28, 29] Care usually begins in the first trimester of pregnancy, with the number of visits increasing as the pregnancy progresses, and may consist of 10-14 visits if the pregnancy goes to term.[30]

All local health departments in Tennessee provide "basic prenatal care," which includes:

- pregnancy testing;
- HIV and sexually transmitted disease testing and counseling;
- blood pressure monitoring;
- determination of TennCare presumptive eligibility;
- referral for the Special Supplemental Food Program for Women, Infants and Children (WIC);
- referral to other providers of prenatal care;
- nutrition and smoking cessation education through WIC;
- and, in some cases, maternal weight measurement and urinalysis.[f]

Local health departments that provide only basic prenatal care services do not perform maternal risk assessments and counseling for pregnant women, while ten county health departments[g] that provide *comprehensive prenatal care* do provide these additional services. These health departments provide comprehensive prenatal care and obstetrical services primarily to uninsured women who are not U.S. citizens and therefore do not qualify for TennCare.[31] Local health departments in these counties make prenatal services available because there is a lack of providers who will take uninsured clients.

Following the TennCare presumptive eligibility screening at a local health department, an eligible client is referred to an obstetric provider—an obstetrician, a nurse-midwife or nurse-practitioner, or a family physician that performs deliveries—if one is available in her local area. If not, the client can return to the health department for repeated basic prenatal health screenings at intervals that comply with standards outlined by the American College of Obstetricians and Gynecologists (ACOG). The local health departments attempt to find the pregnant woman an appropriate obstetric provider as quickly as possible. While the majority of Tennessee women who are citizens and do not have a private insurance carrier will qualify for TennCare to cover their prenatal care, delivery and postpartum visit, some do not. These women may either go to a community health center and be charged on a sliding fee scale, or work out payment plans with a local doctor and hospital.

Uninsured pregnant women who are not citizens and therefore do not qualify for TennCare must arrange their deliveries with local hospitals or physician groups; TennCare will pay the delivery fees under emergency Medicaid. After delivery, they must return to the health department for their postpartum visit and family planning services.

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[f] Urinalysis can help determine whether the pregnant woman has gestational diabetes, preeclampsia or bladder or kidney infections.

[g] Bedford, Perry, Lewis, Dickson, Montgomery, Rutherford, Sumner, Wilson, Madison, and Hamilton counties all currently provide comprehensive prenatal care.

## *Home Visiting*

Prenatal home visiting programs aim to take prenatal care into the homes of pregnant women who are at a higher risk of complications, allowing the home visitors to address social, environmental and health issues all at one time.[32, 33] While providing the opportunity for education and outreach, home visits can also assure that women receive timely and appropriate prenatal care, keep doctors' appointments and identify potential problems for which they may need to see a doctor or specialist.

Although the effects of home visiting programs on outcomes such as birth weight and preterm birth are uncertain,[34] they appear to have psychosocial effects. High-risk families tend to experience benefits from participating in home visiting programs that extend to long-term life choices, changes in maternal behaviors, and modification of antisocial behavior.[h] Exhibit 7 lists observed benefits from several different nurse home visiting programs.

**Exhibit 7: Potential Benefits of Nurse Home-Visiting Programs[35]**

| Potential Benefits of Home Visitation Programs | | |
|---|---|---|
| **Prenatal Effects** | **Postnatal Effects** | **Long-Term Effects** |
| • Increased use of prenatal care<br>• Increased birth weight<br>• Decreased preterm labor and increased length of gestation<br>• Increased use of health and other community resources[i]<br>• Improved nutrition during pregnancy<br>• Fewer urinary tract infections during pregnancy<br>• Increased attendance at childbirth classes<br>• Decrease in maternal smoking<br>• Greater interest by fathers in the pregnancy<br>• Increase in the number of mothers having a labor room companion | • Fewer subsequent pregnancies<br>• Increased spacing between pregnancies<br>• Increased length of maternal employment<br>• Increased rate of return to, or retention in, school by mothers<br>• Fewer emergency department visits<br>• Fewer accidental injuries and poisonings resulting in a visit to the physician<br>• Decrease in physical punishment and restriction of infant, with an increase in appropriate discipline for older children<br>• Improved maternal-child interaction and maternal satisfaction with parenting<br>• Increased use of appropriate play materials at home<br>• Improved growth in low birth weight infants<br>• Higher developmental quotients in infants visited | • Reduced maternal criminal behavior<br>• Decrease in use of welfare<br>• Decrease in verified incidents of child abuse and neglect<br>• Less maternal behavior impairment attributable to alcohol and drug abuse |

*Source: American Academy of Pediatrics, Council on Child and Adolescent Health, "The Role of Home Visitation Programs in Improving Health Outcomes for Children and Families," Pediatrics 101(3):486-489, March 1998.*

Programs can vary on a number of elements, such as:

- Program goals (i.e., preventing child abuse, encouraging prenatal or well-baby care, promoting healthy behaviors, linking women with other health and human services)
- Who delivers the care (i.e., layperson or nurse)
- Who receives the care (i.e., pregnant teen, first-time parent, low-income family, families with special needs, children with developmental delays)

[h] Children who display antisocial behavior early in life often have problems that can be traced to poor prenatal health conditions that interfered with fetal nervous system development. David Olds, developer of the Prenatal and Early Childhood Nurse Home Visiting Program, observed that risk factors associated with the early development of antisocial behavior could be modified. These include: troubled maternal life course, child abuse/ neglect and maternal health-related behaviors associated with children's neuropsychological deficits.

[i] "Other community resources" include prenatal visits, well-child visits, family planning, programs for women, infants and children (WIC), and immunizations

Home visiting programs that produce consistently positive results tend to be flexible, family-specific programs that begin in pregnancy and continue for the first two to five years of the child's life. Often, the home visitor is a nurse or well-trained professional who promotes positive, healthy behaviors and focuses on the improvement of both social and physical environments.

***Home visiting programs available in Tennessee***

There are three state-administered home visiting programs available in Tennessee:[36] HUGS, CHAD, and Tennessee Healthy Start (see Exhibit 8). At least one home visiting program is available in 79 of the 95 counties in the state.

**Exhibit 8: Tennessee Home Visiting Programs**

| Program Name and Goal | Program Details |
|---|---|
| ***Help Us Grow Successfully (HUGS)***<br><br>***Goal:*** To prevent or reduce:<br>• complications of pregnancy<br>• subsequent unplanned pregnancies<br>• developmental delays in children<br>• maternal and infant morbidity and mortality<br><br>Components include:<br>• assistance in accessing medical, social and educational services<br>• grief counseling to women who have lost a child under the age of 2 due to miscarriage, stillbirth, prematurity, or SIDS. | ***Target Population:***<br>• Pregnant women<br>• Postpartum women up to 2 years, including those who have lost a child<br>• Infants and children up to age 6<br><br>***Families Served:*** In FY 2003-2004 HUGS made 36,541 visits to children in 74 counties. Local health departments are using HUGS for special outreach and follow-up for high-risk pregnancies.<br><br>***Source of Funding:*** Combination of TennCare funds and federal grants with state funding match through TDOH |
| ***Child Health and Development (CHAD)***<br><br>***Goal:*** To reduce abuse, neglect and developmental delays by providing parent support and education services.<br><br>CHAD provides:<br>• assessments and screenings<br>• child development education<br>• parenting education/support<br>• health support. | ***Target Population:***<br>• Only girls under age 18 can receive prenatal services<br>• Families that either meet a financial requirement or are in the Child Protective Services system can receive services until their child is 6 years old.<br><br>***Families Served:*** CHAD is available in all but 23 counties in the East and Northeast Regions. The program served 1,427 children in FY2004.<br><br>***Source of Funding:*** The Department of Children's Services uses a portion of its federal Social Services Block Grant to contract with the Department of Health to provide CHAD services. It is also partially funded by TennCare Outreach |
| ***Tennessee Healthy Start***<br><br>***Goal:*** To reduce infant and child mortality, prevent child abuse and neglect and promote family health.<br><br>Families receive child development education as well as general support and parenting education | ***Target Population:*** Families at an elevated risk of child abuse or neglect.<br><br>***Families Served:*** In FY2004 Healthy Start served 1752 children from 1,416 families in 67 counties.<br><br>***Source of Funding:*** Federal grants with state funding match, through DCS and the TDOH |

*Sources: Tennessee Department of Health, correspondence with Theodora Pinnock.*

***Memphis/Shelby County Healthy Start***: The federal Healthy Start grants money directly to local health departments with a focus on eliminating factors that lead to infant mortality

and other poor birth outcomes in high-risk populations. The goal of the Memphis/Shelby County Healthy Start is outreach to clients to assure the continuity of health care and social care up to two years post-partum. The home visitors provide information and monitor behavior through regular contact with the mother. One of the following conditions must be met for the expectant mother to participate in the program:[37]

- under 21 years of age
- African American
- Hispanic
- homeless
- experienced a previous miscarriage
- previously had a low birth weight baby
- currently experiences domestic abuse
- substance abuser

### *Special Supplemental Food Program for Women, Infants, and Children (WIC)*

Started in 1974, WIC is a federally funded program that provides food and nutrition education for low-income pregnant women, infants, and children. The Tennessee WIC Approved Foods for 2004-2006 are milk, cheese, eggs, juice, peanut-butter, iron-fortified cereals, dried beans, and infant formula. Tuna and carrots are also approved for women who only breastfeed.
*Target population:* Services are available for pregnant, postpartum, and breastfeeding women, infants, and children up to age five who meet income and nutrition guidelines. Individuals who receive food stamps, AFDC, or who are on TennCare are income eligible for WIC. Individuals who have documented medical or nutritional needs are eligible.
*Families served:* WIC serves 155,000 people in Tennessee through a $101 million grant from the Department of Health and an additional $34 million from an infant formula rebate contract with the Nestle Company.

### *Child Health Screenings*

While this report does not intend to address child health screenings, and instead focuses on maternal and infant care, the child health screenings available in Tennessee are briefly outlined below[38]

**Newborn Hearing Screening.** In 2003, 86 of the 89 birthing facilities in Tennessee provided Newborn Hearing Screenings to 97 percent of the birth population. The screening allows an infant with hearing loss to be diagnosed early and allows parents the opportunity to plan for appropriate interventions.

**Newborn Genetics Screening.** All babies born in Tennessee are screened for 61 genetic disorders. The comprehensive system in Tennessee provides screening, diagnostic testing, and counseling services.

**Early and Periodic Screening, Diagnostic and Treatment (EPSDT**). Local health departments provide 55,000 EPSDT well-child screenings per year to identify behavioral or developmental problems. All TennCare recipients under age 21 are eligible for these screenings. The Department of Health provides all EPSDT for children in state custody.

### *Perinatal Regionalization*

The Perinatal Regionalization system is intended to provide all pregnant women and newborns in the state with access to an appropriate level of care—and the accompanying personnel, knowledge and equipment to serve those at high risk—that is usually available only in densely populated communities. Based on the idea that access to specialists, technologies and neonatal intensive care units (NICUs) can reduce neonatal mortality,[39] the regionalization system organizes participating hospitals into a coordinated system of information-sharing, referral and transport of patients, ideally permitting every infant and mother access to the right level of care.

This system gained recognition in the U.S. in 1971 when the American Medical Association released a statement on the benefits of regionalized perinatal care, and acquired support in 1978 when the U.S. Department of Health and Human Services issued guidelines that mandated a regional planning model for neonatal and maternal obstetrics. By the end of the 1980s, 26 states, including Tennessee, had established referral systems or had guidelines in place. *Tennessee Code Annotated* Sections 68-1-802 through 68-1-804 outline the establishment of the perinatal regionalization system in Tennessee. [40]

Hospitals designate themselves[j] as providing one of four levels of care, as defined by Tennessee Perinatal Care System Guidelines (for the number of participating hospitals by self-designated level and a list of counties without a hospital, see Appendix III).

- *Level I* hospitals provide basic care for uncomplicated maternity and neonatal patients.
- *Level II-A* hospitals may care for patients with mild obstetric or neonatal illnesses.
- *Level II-B* hospitals can deal with complex maternal and neonatal abnormalities.
- *Level III* hospitals can manage the most severe and complex maternal and neonatal illnesses.

Tennessee has five Regional Perinatal Centers which are designated as Level III hospitals and are connected to a medical school and a wide variety of specialists.[41] These centers are responsible for: (1) educating health care workers in their region to recognize high-risk mothers and infants and providing early management of those patients; (2) consulting with other hospitals about high-risk pregnant women and infants; and (3) providing a referral and transfer system for high risk patients within their region when necessary. The centers, listed below, are located strategically across the state.

- Johnson City Medical Center Hospital
- UT Medical Center at Knoxville
- Erlanger Medical Center/TC Thompson Children's Hospital in Chattanooga
- Vanderbilt University Hospital in Nashville
- Regional Medical Center at Memphis

## *Access to (Obstetric) Health Care*

***State Programs.*** The Health Access Act of 1989[42] (T.C.A 66-29-151) established the Health Access Incentive grant program, also called the Practice Incentive Grant, to alleviate shortages in primary care by providing financial incentives for primary care providers[k] to establish new practices in Health Resource Shortage Areas (HRSA) (see Exhibit 9 for shortage area definitions used by the Department of Health).

**Exhibit 9: Shortage Area Definitions**

| Geographic Area Definitions Used by the Tennessee Department of Health | |
|---|---|
| **Rational Service Area (RSA)** | RSAs for obstetrical care are individual counties, groups of counties, or communities that have common obstetrical care service patterns for residents. There are 37 RSAs for obstetric care in Tennessee. |
| **Health Resource Shortage Area (HRSA)** | HRSAs for obstetrics are RSAs with inadequate or no obstetrical services. Within the 37 RSAs, 30 of Tennessee's 95 counties are designated as obstetric shortage areas (see Map X below). |
| **Health Professional Shortage Area (HPSA)** | HPSAs are federally-designated counties, parts of counties, or public facilities that meet standards of need for primary, dental, and mental health care services. |
| **Medically Underserved Area/Population** | MUAs and MUPs are federal designations; 94 of the state's 95 counties are either partial or whole MUAs. |

*Source: Tennessee Department of Health, Health Access Plan Update 2004 and interview with Alisa Malone.*

[j] There is no uniform definition in the United States for the designated hospital levels although the American Academy of Pediatrics Committee on Fetus and Newborn recommends it

[k] Primary care practitioners eligible for this Grant include physicians, nurse practitioners, physician assistants and dentists.

The TDOH's Community Services Section designated HRSAs in order to direct health resources to the most critically underserved communities in the state (Exhibit 10).

**Exhibit 10: Top 30 Health Resource Shortage Areas for Obstetrics, 2003**

*Source: Tennessee Department of Health, Health Access Plan 2004.*

In 1997, the scope of the Health Access Program was expanded to include a Community Initiative Program to assist communities in developing innovative health care service delivery models in areas that lack basic health services. The projects that come out of the Program usually focus on the direct provision of health services or on enhancing access to existing resources. Types of Community Initiative Projects (see Appendix IV) may include recruitment incentives, service-linked training opportunities, support for technology or telecommunications efforts, projects that focus on special population groups in underserved areas, new delivery systems and projects that are designed to improve existing systems.[43]

***Federal Programs.*** While Health Resource Shortage Areas designations determine where Practice Incentive Grant recipients will be placed, federal Health Professional Shortage Area (HPSA) designations govern which counties will be eligible for the placement of National Health Service Corps (NHSC) providers. NHSC is a US Department of Health and Human Services program facilitated by the Community Services Section of the Tennessee Department of Health that recruits health care providers[I] for underserved areas. The components of the NHSC include a Loan Repayment Program, a Scholarship Program, Student/Resident Experiences in Community Health (SEARCH) opportunities and a State Loan Repayment Program.

## *Programs for Pregnant Teens*

There are several programs legislated for teens who become pregnant. Most focus on keeping the teens in school and teaching them parenting skills.

**Exhibit 11: Tennessee Programs for Teen Parents**

| | |
|---|---|
| *T.C.A.* 71-3-701 | *Project RAP (Responsible Adolescent Parenting)* |
| *T.C.A.* 49-1-501, *et seq.* | *Model dropout prevention program; Model teen learning centers; Dropout Prevention Act of 1990* |
| *T.C.A.* 49-10-1101, *et seq.* | *Homebound Instruction for Pregnant Students* |
| *T.C.A.* 49-1-206 | *Preschool/parenting learning centers for teen parents* |
| *T.C.A.* 63-6-223 | *Prenatal care for minors* |
| *T.C.A.* 68-34-107 | *Contraceptives for minors* |
| *T.C.A.* 37-3-521 | *Informational services for teen parents regarding second or subsequent pregnancies; Targeting at-risk first time teen parents.* |
| *T.C.A.* 49-6-1301 | *Family life instruction with emphasis on abstinence* |

[I] Healthcare practitioners eligible for NHSC include family practice physicians, internists, pediatricians, OB/GYNs, psychiatrists, dentists, dental hygienists, nurse practitioners, physician assistants, certified nurse midwives and certified mental health professionals.

While these are important programs, they lack emphasis on pregnancy health and infant health: pregnant teens often have disproportionately higher incidences of poor birth outcomes.

Tennessee's teen[m] pregnancy rate declined 45 percent between 1990 and 2003. The rate declined 45 percent for white teens and 49 percent for black teens. Additionally, Tennessee's repeat teen pregnancy rate declined 27 percent.[44] However, during this time, the infant mortality rate, the percent of low weight births, and the percent of preterm births all increased statewide.

Another at-risk age group is women over 35, however there are no maternal/pregnancy programs legislated that do not deal solely with teens, apart from the perinatal regionalization system.

### *Sudden Infant Death Syndrome (SIDS) Legislation*

**Legislated emergency responses.** *T.C.A.* 68-1-1102 – 68-1-1103 requires emergency responses to SIDS, such as a death investigation; programs for training child death pathologists, emergency medical technicians, professional firefighters, and law enforcement officers on the handling of cases of sudden, unexplained child death; data collection at the Department of Health; and counseling services for families affected by the occurrence of sudden infant death syndrome.

**New preventive regulations.** Until this year, the Department of Human Services' "Licensure Rules for Child Care Centers Serving Pre-school Children" (Chapter 1240-4-3) did not require centers to rest children on their backs to sleep, one of the most commonly recognized preventive measures for SIDS. The rules acknowledged "the possibility of Sudden Infant Death Syndrome," but only required that sleeping infants "be checked every thirty (30) minutes by touching them." If a child appeared not to be breathing, CPR was to be administered immediately. A caregiver who failed to do so would be prohibited from caring for infants.

At the time this report was written, new child care licensure rules and regulations requiring infants to be placed on their backs to sleep had been filed with the Secretary of State.[45] If passed, Tennessee's rules will align with the National Health and Safety Performance Standards for child care centers in January 2006.

[m] Ages 10-17.

# CONCLUSION 1: POOR MATERNAL HEALTH AFFECTS INFANT HEALTH, LEADING TO LONG-TERM HEALTH ISSUES WITH HIGH COSTS FOR TENNESSEE

## Tennessee ranks 48th in the country in infant mortality, 46th in low birth weight births, and 46th in preterm births

Poor birth outcomes are more common in Tennessee than in much of the rest of the United States. Of the approximately 78,000 infants born in Tennessee each year, over 700 die before their first birthday, 10,000 are born preterm, 7,000 are born with low birth weight, and 1,000 are born with very low birth weight[n]. These birth outcomes regularly rank Tennessee among the bottom 10 states in infant health indicators.

**Exhibit 12: Tennessee's Birth Outcomes Rankings**

| Indicator | Year | Rate or Percent | State Ranking |
|---|---|---|---|
| Infant Mortality Rate | 2003 | 9.2 | 48 |
| Percent Preterm Births | 2003 | 14.1 | 46 |
| Percent Low Birth Weight | 2003 | 9.4 | 46 |

*Source: U.S. Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau, "National Outcome Measure #01;" National Vital Statistics Report, Centers for Disease Control, 2005.*

Each year, approximately 60,000 infants are born to white women, 16,000 to African American women, and 3,000 to Hispanic women. Approximately 10,000 infants are born to teens 10-19, 24,000 to women age 20-24, 36,000 to women age 25-34, and 7,000 to women age 35-44.[46] Tennessee regularly ranks among the bottom 15 states in maternal health indicators. (See Appendix II – for Memphis and Nashville rankings.)

**Exhibit 13: Tennessee's Maternal Health Indicator Rankings, 2002**

| Indicator | Percent | State Ranking |
|---|---|---|
| Percent Births to Teens | 13.5 | 42 |
| Percent Repeat Births to Teens | 22.1 | 44 |
| Births to Unmarried Women | 36.2 | 38 |
| Births to Mothers with <12 Years of Education | 21.3 | 36 |
| Percent of Mothers who Smoked During Pregnancy | 17.1 | 35 |

*Annie E. Casey Foundation, 2005. The Right Start for America's Newborns: City and State Trends.*

### *Tennessee does not have a healthy baseline from which to produce healthy children.*

In 2004, Tennessee ranked 48th in overall health – above Mississippi and Louisiana. The state's total population ranked 40th in prevalence of smoking, 42nd in prevalence of

[n] Babies than are born preterm are often also born with low or very low birth weight, so these numbers may overlap

obesity, 45th in premature death (years of life lost per 100,000 population), and 46th in both cardiovascular deaths and violent crimes.[47]

According to the U.S. Department of Health and Human Services, in 2004 women in Tennessee ranked 50th—the worst—in stroke death rate, 49th in coronary heart disease death rate, 49th in leisure-time physical activity, 48th in high blood pressure, 44th in heart disease death rate, 44th in smoking, 40th in obesity, and 36th in smoking during pregnancy.[48] The National Women's Law Center ranked Tennessee 42nd in women's overall health, 47th in diabetes, and 39th in life expectancy.[49]

**Smoking: A Modifiable Risk Factor.** In 2002, 17 percent of live births in Tennessee were to women who smoked during pregnancy – 19.7 percent of white births and 8.3 percent of black births. Smoking during pregnancy is most common among white teens – 24.5 percent versus 3.6 percent of live births to African American teens.

Smoking during pregnancy restricts the growing fetus' access to oxygen, leading to adverse pregnancy and birth outcomes such as preterm delivery, intrauterine growth retardation, low birth weight, stillbirth and neonatal death, [50] intellectual impairment in young children,[51] and Sudden Infant Death Syndrome. The longer the mother smokes during pregnancy, the greater the effect on the infant's birth weight. Women who stop smoking during the first trimester have infants with birth weight comparable to that of nonsmokers' infants.[52]

Twenty-five states cover smoking cessation counseling services or programs either specifically for pregnant women covered by Medicaid or for the entire Medicaid population.[o] Tennessee does not.

### *Prevention efforts focused on preconception health, health behaviors, and prenatal care would likely have the largest impact on Tennessee's infant mortality rate.*

Poor maternal health is a leading contributor to poor birth outcomes. Women's health care prior to pregnancy can reduce high-risk births and poor birth outcomes. Doctor visits prior to pregnancy afford women the opportunity to discover and treat pre-existing conditions, such as diabetes, hypertension, and sexually transmitted diseases.[54] However, often a woman's first doctor's visit is after she is pregnant.[55]

> ***"A medical model directed at a six-to-eight month interval in a woman's life can not erase the influence of years of social, economic, and emotional distress and hardship."*** [53]

> ***"Ultimately, the ability to achieve and sustain improved birth outcomes will coincide with improved health status and increased access to care for women before they become pregnant or between pregnancies."*** [56]

Pregnancy provides a very narrow window in which to concentrate prevention efforts. Interventions and policies directed at improving access to care during pregnancy may fall short of the goal of reducing poor birth outcomes because they cannot address the "legacy of poor health status and health behaviors."[57] In order to have a healthy birth, a woman's health must be addressed before conception.

[o] Florida, Indiana, Kansas, Maine, Minnesota, New Jersey, North Dakota, Oregon, Pennsylvania, Rhode Island, West Virginia, and Wisconsin covered any Medicaid patient. Arizona, Colorado, Delaware, Kentucky, Louisiana, Mississippi, Nevada, New Hampshire, North Carolina, Utah, Virginia, and Washington cover pregnant women. Nebraska covers pregnant teens

The Health Departments in Chattanooga, Memphis, and Nashville have each conducted a Perinatal Periods of Risk (PPOR) analysis to identify the leading contributors to the overall infant mortality rate (see Appendix V). These studies reveal that the majority of infant deaths in each city are associated with general health conditions and health factors present (and in many cases preventable) among women of childbearing ages prior to and between pregnancies. When the categorical rates are broken down by race and education, the effects of maternal health increase among African American women and women with less than 13 years of education (see Appendix V).

These findings could allow a community to develop specific infant mortality interventions. Given that maternal health is the greatest contributor to infant mortality, the most effective steps to infant mortality prevention might be efforts to address maternal and infant health as women's health issues, regardless of pregnancy status.

## Poor birth outcomes increase health spending

Based on 2002 Tennessee data, low birth weight occurs in 9.2 percent of live births, but such births are estimated to account for 52 percent of all billed hospital charges for births.[58] The Tennessee Department of Health estimated that in 2002 the total charges associated with LBW were $160 million dollars. All health care payers – individuals, businesses, and the State – share the costs associated with the survival, lifelong health problems, and developmental delays of these infants. Maternity-related expenses are often the largest cost to employers' health care plans.[59]

### *Low birthweight and preterm infants require longer initial hospital stays and develop more health problems than their higher weight peers*

The average length of an infant's initial hospital stay is 10.9 days for low birthweight infants, compared to 2.3 for normal birthweight infants.[61] The Tennessee Department of Health estimated that the average charge for a low birthweight delivery in 2002 in Tennessee was $24,567 compared to $1,896 for a normal birthweight delivery without complications. However, according to the U.S. Department of Health and Human Services, an increase of ½ pound in birth weight would save an estimated $12,000 to $16,000 in first-year medical expenses.[62]

**Initial hospitalizations for low birth weight infants in Hamilton County cost $11 million in 2001.** [60]

LBW and preterm infants commonly have the following health problems which contribute to their longer hospital stays and higher service charges:

- inability to maintain body temperature
- difficulty feeding and gaining weight
- breathing problems such as low oxygen levels, respiratory distress syndrome, and asthma
- neurological problems such as bleeding inside the brain
- gastrointestinal problems
- mental retardation and cerebral palsy
- vision and hearing loss

### *Low birthweight and preterm infants perpetuate a larger cycle of poor birth outcomes*

LBW is associated with the development of diabetes and hypertension in adulthood. Both of these are risk factors for adverse birth outcomes. Therefore, "women who themselves were of low birth weight are at an increased risk of having a low birth weight infant,"[63] who, in turn, will accumulate related medical expenses.

## Poor birth outcomes increase education spending

The American Academy of Pediatrics published estimates of the excess educational costs for low birthweight babies in Florida. The report concludes that if nine percent of infants who weighed between 1,500 and 2,499 g could be delivered at 2,500 g, then the state of Florida potentially could save $1 million in kindergarten costs. This is because children who were born at <1,000 grams generated 71 percent higher costs[p] in kindergarten than children who were born at >2,500 g. Children who were born at 1,000 to 1,499 grams generated 49 percent higher costs.[64]

### *Learning disabilities increase the demand for special education and decrease the likelihood of graduation*

Students who are born prematurely or with low birthweight are more likely than their peers to have mild learning disabilities, attention disorders, and developmental impairments.[65] They are more likely to require special education services, repeat a grade of school, and require extra help with reading, spelling, math, and handwriting. These children are also more likely to require speech, occupational, or physical therapy.[66] These learning disabilities and developmental impairments result in a 34-percent decrease in the probability of graduating from high school by age 19.[67]

[p] The higher costs were often associated with greater personnel and special education costs.

# CONCLUSION 2: TENNESSEE'S MATERNAL AND INFANT HEALTH CARE SYSTEM APPEARS TO LACK HUMAN, FINANCIAL AND STRUCTURAL RESOURCES

**In 2003, 15 of Tennessee's 95 counties reported having no obstetric provider.**[68]

While the absence of a provider may relate to a lack of patient demand (i.e., few annual births in a county or close proximity to services in a neighboring county), availability of facilities or physicians that offer prenatal and obstetric delivery services is a very real concern in this state.

**Between 1996 and 1999, a majority of Tennessee counties identified issues of access to prenatal care and obstetric services.** In 1996, Tennessee counties began a Community Needs Assessment process to evaluate challenges facing each community's health care delivery system. The process involved several components, including a Community Stakeholder Survey, a Behavioral Risk Factor Survey, and the analysis of secondary data made available to each county through the Department of Health. In 2000, each county developed its own health priorities from these surveys and data.[q]

The Community Stakeholder survey looked at the perceived health care needs of community members—specifically the accessibility, adequacy of, and level of satisfaction with health care services in the community. Twenty-nine counties perceived that women's health services were not adequately available and 11 counties perceived that pregnancy care was not adequately available.

The Behavioral Risk Factor Survey collected information on adult health behaviors and preventive practices. Through this survey, 30 counties determined that access to prenatal care was one of the top four "community issues" and 27 counties found that over 20 percent of their survey respondents thought it was either a "definite problem" or "somewhat a problem."

Secondary data[r] revealed that 55 counties had high numbers of LBW infants, problems with prenatal care access and timing, high numbers of high-risk pregnancies, high infant mortality rates or limited access to obstetric care. In sum, when considering the current top 30 state-identified obstetric shortage areas and the surveys and secondary data that informed the process of prioritization of health needs on the community level, only 13[s] of the state's 95 counties did not determine these issues as important topics of consideration and discussion.

### *Obstetric care providers have few incentives to locate in rural areas, so personnel distribution is concentrated in the state's metropolitan areas.*

The lack of women's healthcare in rural areas of the state exacerbates the already unique health needs of that population. Over their lifetimes rural women receive less preventive care (including prenatal care) and have higher rates of chronic disease than their urban counterparts.[69] Because women who live in rural areas tend to have less education and fewer job opportunities, they are also less likely to have private insurance.

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[q] Each county's Year 2000 profile is available online at http://hit.state.tn.us/Profiles.aspx.

[r] Secondary data sources were made available from state Departments of Health, and Economic and Community Development and the Tennessee Commission on Children and Youth.

[s] The thirteen counties that did not indicate maternal and infant health issues as concerns or priorities were: Carroll, Chester, Coffee, Crockett, Decatur, Hardeman, Hawkins, Haywood, Madison, Tipton, Washington, Weakley and Williamson.

In 2003, there were 535 FTE[t] obstetric physicians and 23 FTE[u] mid-level obstetric providers practicing in Tennessee.[70] Of these, 81 percent of obstetric physicians and 41 percent of mid-level providers were practicing in the four metropolitan areas of Davidson, Hamilton, Knox and Shelby counties—where 39[v] percent of Tennessee's population resides.

The answer to the OB/GYN shortage is not simply to make a position available in a rural community. A physician's decision about whether to locate in a rural or urban area is dependent upon many factors. If a physician is from a rural background, plans to open a family practice, or has taken a rural clinical rotation during medical school, he or she is more likely to decide to practice in a rural setting.[71] Yet, most medical schools are located in urban areas, allowing very few medical students rural clinical experiences.

**Support-for-Service Programs**. Many states have created financial "support-for-service" programs like scholarships, service-option loans, loan repayment, direct financial incentives and resident support programs to attract medical practitioners into rural and medically underserved areas.[72] These programs provide debt-burdened young doctors with financial relief while exposing them to medical practice in rural settings. According to a recent study supported by the U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality, doctors who serve in these state programs are more satisfied with their work, remain in their service sites longer than nonobligated generalists, and care for more Medicaid and uninsured patients.

*Health Access Incentive Grant* Tennessee's Health Access Incentive Grant Program is an example of a state support-for-service program. Between 1989 and 2003, 205 providers were placed in health resource shortage areas in Tennessee through this program. [73] Twenty-six were obstetricians, 21 were OB-capable family physicians, and five were certified nurse midwives. Data was unavailable to determine where obstetric care providers had been placed, or how long they had stayed after their service obligation ended. However, Department officials believe that the Practice Incentive Grants provide enough incentive to make the program attractive and well-attended. While support-for-service programs help address rural health shortages — including obstetrics — the Practice Incentive Grant is the only state-sponsored incentive program that encourages healthcare providers to practice in rural areas.

*NHSC* The federal National Health Service Corps (NHSC) support-for-service program has benefited Tennessee through scholarships and loan repayments it has awarded to individual providers. In FY 2004, the NHSC placed nine scholars in Tennessee[74] and made a total of 33 Loan Repayment awards. The NHSC also maintains a State Loan Repayment Program[75] that provides matching funds directly to States to operate their own loan repayment programs. According to the Department of Health's Community Services Section, Tennessee has not participated in the SLR program since 2000 because of few physician applicants, unreliable community financial matches, and time-consuming administrative requirements. If Tennessee could overcome these obstacles with technical assistance from the federal government, the state could access additional funds to support the placement of physicians in areas where they are most needed.

Although the state's Health Access Incentive Grant and the Federal NHSC program do, in fact, benefit Tennessee health shortage areas, these programs are not the sole answer to the obstetric provider shortage question.

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[t] The full time equivalency (FTE) of obstetric providers is the percentage of the provider's practice devoted to obstetrics multiplied by the number of hours the provider reported as spent in direct patient care.
[u] Mid-level providers' full time equivalency is the percentage of their practice devoted to prenatal and delivery services.
[v] U.S. Census Bureau data from 2000 reports the following population data for the metropolitan counties in Tennessee: Davidson (569,891); Hamilton (307,896); Knox (382,032) and Shelby (897,472). The total Tennessee population is reported as 5,689,283.

***Many physicians find it increasingly difficult to maintain their practices when faced with rising medical liability insurance rates and below market reimbursement rates.***

OB/GYNs have the highest medical liability premiums of any medical professional, and the premiums do not vary according to location. Medical liability premiums for fifth-year obstetrics and gynecology physicians covered by State Volunteer Mutual Insurance Company – the largest provider in the state –increased 132 percent between 1995 and 2005 to the current premium of $62,609. Although physicians in Tennessee can reduce their medical liability premiums by almost 50 percent by eliminating delivery services, premiums for fifth-year gynecologists who do not provide obstetric services nonetheless increased 130 percent during the same time to the current premium of $31,741.[76]

**Exhibit 14: State Volunteer Mutual Insurance Company, Tennessee Physician Premiums, 1995-2005[w]**

| | Obstetrics and Gynecology | Gynecology Without Obstetrics | Neurosurgery | Emergency Medicine | Internal Medicine |
|---|---|---|---|---|---|
| **2005** | $62,609 | $31,741 | $58,835 | $30,032 | $9,154 |
| **2000** | $34,301 | $17,474 | $32,254 | $13,876 | $5,093 |
| **1995** | $27,031 | $13,778 | $25,420 | $9,619 | $4,028 |

As insurance becomes unaffordable, physicians are forced to close their practices or drop vital services — actions which seriously impede patient access to care. The American Hospital Association reports that more than 26 percent of health care institutions have reacted to the liability crisis by cutting back on services or eliminating units. Many obstetrician-gynecologists have stopped delivering babies. While the causes of increasing liability premium rates are debatable, "there is little dispute that rapidly increasing malpractice rates have mobilized physicians."[77]

Pregnant women in rural areas are generally the first to be affected. While rural and urban physicians have the same liability costs, rural physicians often receive lower reimbursement rates for services because they work with a population that tends to lack private health insurance, be self-employed, and have a higher proportion of low income families.[78]

**Exhibit 15: Average Charges and Reimbursements for Obstetricians in Tennessee**

| Service Provided | Charge | Private Insurance Reimbursement (% of charge) | TennCare Reimbursement (% of charge) |
|---|---|---|---|
| Vaginal Delivery & Care | $2,465 | $1,988 (80.6%) | $1,250 (50.7%) |
| C-Section & Care | $2,850 | $2,139 (75%) | $1,292 (45.3%) |

*Source: State Volunteer Mutual Insurance Company, "Effect of Malpractice Premiums on Obstetrical Care," 2003.*

Low reimbursement rates are particularly problematic in rural areas with high percentages of TennCare patients. When providers are not reimbursed at a sufficient rate to cover their costs they opt out of accepting TennCare enrollees. In 2002, TennCare covered 48.9 percent of the total births in Tennessee.[79] Each year approximately 42 percent of births to white women and 73 percent of births to African American women are covered by Medicaid.

As TennCare reimbursement rates remain static and liability costs increase, a doctor must serve more obstetric patients for the service to be financially feasible. However, the number of births statewide is relatively stable.[x] Thus, an OB provider is unable to make

[w] $1 million coverage, Mature claims-made premiums
[x] The average rate of change in total births was less than 1 percent from 1996 to 2003.

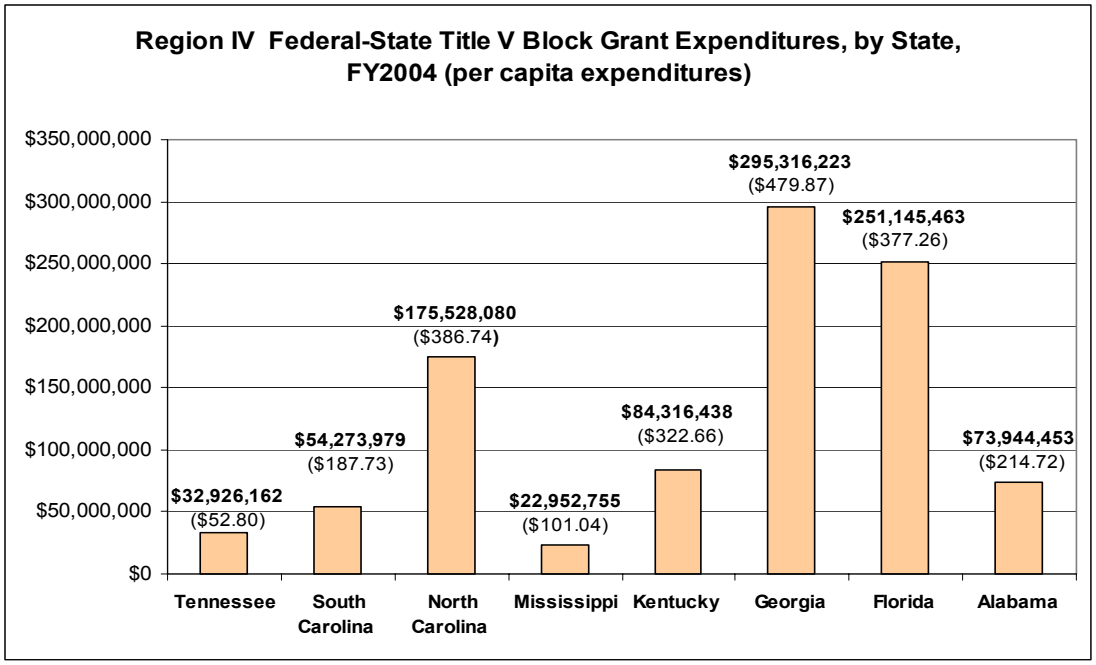
up the increasing practice costs (including malpractice premiums) by serving more OB patients. Maintaining OB services is becoming increasingly difficult for financial reasons, especially in rural areas where the volume of OB patients is low.

## Tennessee does not address all MCH populations equally with available limited resources.

**The federal government distributes less money to Tennessee through the Federal Title V Block Grant than any other state in federal health Region IV except Mississippi.** The Title V Block Grant is a federal-state partnership that was converted to a block grant in 1981 with the Omnibus Budget Reconciliation Act. The amount awarded to each state health agency through Title V is based on the amount awarded to the states in 1981 with an additional amount distributed according to the proportion of low income children in a state compared to the total number of low income children for all the states.[80] States are obligated to provide three dollars for every four federal dollars allocated, maintaining a minimum level at least equal to the level the state provided in FY1989.

However, a 1992 Government Accountability Office (formerly the General Accounting Office) study[y] revealed that, in some cases MCH funding actually denies "beneficiary equity" (the level of need among states) and "taxpayer equity" (taxpayers' ability to shoulder the burden of providing healthcare). More aid actually tends to go to states with lower concentrations of low birth weight babies and lower service costs.[81] Poorer states with higher concentrations of low birth weight births, for example, may get less money than richer states with fewer cases of poor birth outcomes. A regression analysis performed in the study revealed a "near-random relationship between MCH funding and concentrations of children at-risk" (page 20).

**Exhibit 16: Region IV Federal-State Partnership Budgets, in Total Dollars, FY 2005**




*Source: U.S. Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau, Title V Information System website.*

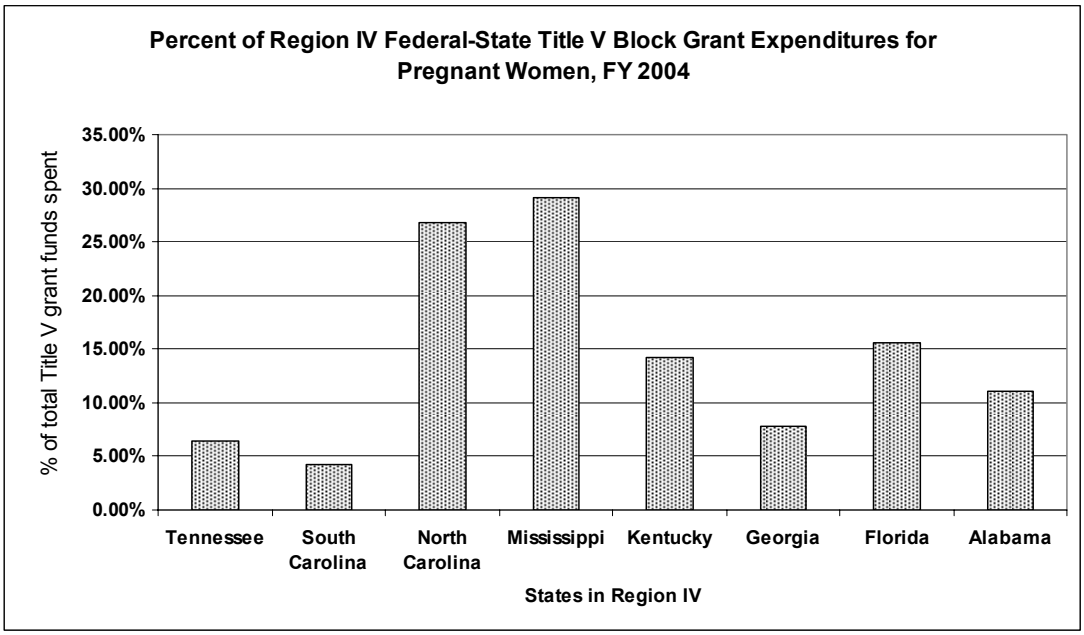
[y] While GAO has not produced an update to this report, an U.S. Department of Health and Human Services document, *Understanding Title V of the Social Security Act*, states that the federal-state allocation formula was last amended in 1989. This information was verified through the HRSA Call Center. Considering that this formula is the basis for the 1992 GAO report, we can assume that the conditions on which the report's conclusions were based have not changed.

### *Tennessee's distribution method for Title V funds among MCH populations put pregnant women at an additional funding disadvantage*

The Title V Block Grant specifically urges states to tackle comprehensive care for women before, during and after pregnancy and childbirth. Although Tennessee is at a financial disadvantage because it receives less Title V Block Grant funds than all but one other state in its federal health region, the way Tennessee chooses to distribute those funds among the MCH population puts pregnant women at an additional funding disadvantage. Exhibit 17 shows the percentage of total Title V funds various southern states allocate to services for pregnant women.

In Health Region IV, only South Carolina allocates a smaller portion of funds (4.3 percent compared to 6.4 percent) but more total dollars ($ 2.3 million compared to $2.1 million) to services for pregnant women than Tennessee.

**Exhibit 17: Percent of Total Federal-State Partnership Funds Allocated to Services for Pregnant Women, FY 2005**




*Source: U.S. Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau, Title V Information System website.*

Under Title V provisions, states must allocate no more than 70 percent of their block grant funds in the following way: 30 percent to preventive and primary care services for children; 30 percent to children with special health care needs; and no more than 10 percent to administrative costs. The remaining 30 percent is to be spent at the state's discretion, but presumably a portion of that funding will go to the other MCH populations: pregnant women and infants. While Tennessee spends 6.4 percent of its Block Grant funds on pregnant women, the Region IV average is 14.2 percent and the U.S. average is 7.8 percent. Tennessee, however, allocates a greater percentage of funds toward services for infants than both the Region IV and the U.S. averages.

### *The Office of Women's Health lacks the resources to achieve legislated purposes*

The "Office of Women's Health Act" (Public Chapter 954) was passed in 2000 without any additional funding, and the Office remains unfunded. According to *TCA* §68-1-1803(5) the Office of Women's Health will "develop and recommend funding and program activities for educating the public on women's health initiatives," including "health needs throughout a woman's life," "access to health care for women," "poverty and women's

health," and "special health concerns for minority women." According to *TCA* §68-1-1803(6) the Office will also "make recommendations to the commissioner regarding programs that address women's health issues for inclusion in the department's annual budget and strategic planning." However, without funds and a staff, the Office can take no formal steps toward achieving these legislated purposes.

The Act allows the Commissioner of Health to appoint an advisory committee on women's health. Such a committee was formed in January 2004, but, like its parent office, the committee has no funding. They meet by conference call to "explore topics," but have no formal link to the Office of Women's Health or opportunities to advise the Department of Health.

While 25 percent of Tennessee's total population is made up of females of child-bearing age (10-44 years of age),[82] neither the MCH Division nor the Office of Women's Health allocates resources to services for this group.

## Tennessee lacks a broad-based, long-term focus on reducing poor birth outcomes[z]

The four categories of services required by the Title V Block Grants to the States are illustrated as a pyramid (Exhibit 19, page 28).[83]

Direct health care services are offered in local health departments in response to identified needs and gaps in service for women, infants and children and are at the top of the pyramid.[84] Enabling services focus on care access and coordination. Population-based services target groups of people or segments of the population. Infrastructure Building Services make up the pyramid's base and involve research, evaluation, planning and policy development. Exhibit 18 provides specific examples of services in each category that are available in Tennessee.

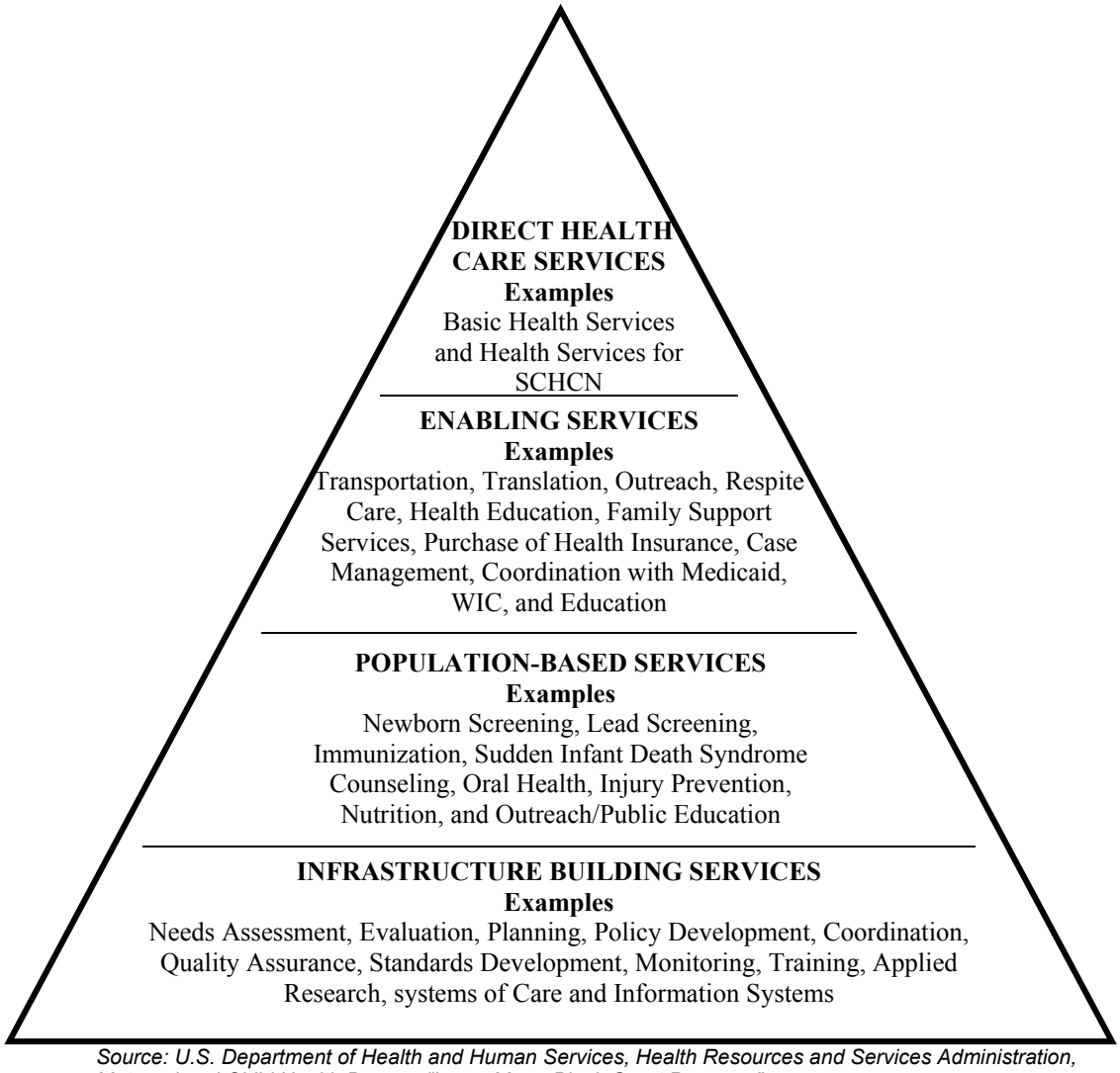
**Exhibit 18: Examples of Service Category Components in Tennessee Title V Programs**

| Category of Service (TN FY2004 Expenditures) | Services provided in Tennessee |
|---|---|
| **Direct Health Care Services ($23,838,541)** | Pregnancy testing, STD screening, HIV counseling/testing, family planning services, WIC, health education, immunizations, well-child screenings |
| **Enabling Services ($3,819,435)** | Home visiting services, TennCare outreach, advocacy, determination of presumptive eligibility, assistance with appeals |
| **Population-based Services ($2,765,798)** | Newborn metabolic screening, newborn hearing screening, STD surveillance, Child Fatality Review, adolescent health, childhood lead poisoning prevention program, SIDS counseling and autopsies, adolescent pregnancy prevention program |
| **Infrastructure-Building Services ($2,502,388)** | Needs assessments, priority setting, quality management, data and systems planning functions; Regional and Local Health Councils; Perinatal Regionalization System; MCH Advisory Committees |

*Source: U.S. Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau, "State Title V Block Grant Narrative. State: TN. Application Year: 2005" and "Federal-State Title V Block Grant Partnership Expenditures by Category of Service FY 2004."*

[z] The "Better Health: It's About Time" initiative launched by the TDOH in April 2004 has six components, two of which address *raising awareness* about infant mortality and access to prenatal care. However, we were unable locate a strategic plan for this initiative with action steps to reduce infant mortality and increase access to prenatal care.

**Exhibit 19: Core Public Health Services Delivered by MCH Agencies**




*Source: U.S. Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau, "Learn More: Block Grant Program."*

### *Tennessee places a greater emphasis on direct health services than on program infrastructure activities that could improve long-term outcomes*

Infrastructure Building Services comprise the base of the pyramid (refer to Exhibit 19), illustrating how activities that support the foundation of MCH health services are essential to the delivery of all of the other categories of services that rest on it. These services include *needs assessments, monitoring and evaluation, planning, policy development, training, research and information/data systems*.

Tennessee allocates less than both the national and regional averages to the infrastructure component — 7.6 percent[85]. On average, states spend 9.1 percent of their total federal-state partnership funds on infrastructure, while in Region IV, states allocate more — 12.1 percent (see Exhibit 20). Instead, spending by category of service in Tennessee heavily favors direct health care services.

Direct Health Care Services are intended to *fill gaps* in health care services provided to pregnant women, infants and children. Since 72.4 percent of the Tennessee Title V Partnership funds go to that service category, it could be assumed that Tennessee's

service gaps are inordinately large. Yet direct services available for pregnant women are extremely limited relative to services available for other MCH populations, especially children. While almost three-quarters of all Title V state-federal partnership funds in Tennessee go to direct health care services — a larger percentage than both the regional and national averages — comprehensive prenatal care, a direct health care service, is only provided at ten local health department clinics.

Exhibit 20 shows that per capita infrastructure expenditures are far below regional and national averages and higher than only South Carolina's in Region IV. The lack of a strong focus on Tennessee's MCH infrastructure may be necessitating the top-heavy focus on direct care.

**Exhibit 20: Federal-State Title V Block Grant Expenditures for Infrastructure, FY 2004**

| State | % of Total Title V Expenditures for Infrastructure | Infrastructure Expenditures in Total Dollars | Per capita Expenditures for Infrastructure |
|---|---|---|---|
| Alabama | 10.3% | $7,606,474 | $35.43 |
| Florida | 26.0% | $65,297,820 | $98.09 |
| Georgia | 8.8% | $25,935,809 | $42.12 |
| Kentucky | 5.2% | $4,360,640 | $16.69 |
| Mississippi | 33.0% | $7,574,409 | $33.33 |
| North Carolina | 3.8% | $6,607,194 | $14.56 |
| South Carolina | 0.4% | $219,522 | $0.76 |
| ***Tennessee*** | ***7.6%*** | ***$2,502,388*** | ***$4.01*** |
| Region IV Average | 12.1% | $120,104,256 | $35.84 |
| National Average | 9.1% | $456,731,739 | $14.22 |

*Source: U.S. Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau, "Number of Individuals Served by Title V" and "Federal-State Title V Block Grant Partnership Expenditures by Category of Service FY 2004."*

### *Although the MCH Division's Needs Assessments identified problems with newborn health outcomes, the resulting priorities did not focus on improving them .*

Title V Block Grant funding guidelines require state health agencies, such as the Tennessee Department of Health's Maternal and Child Health Division, to conduct a statewide needs assessment every five years to identify needs and gaps in MCH services.[86] From the assessment, the State determines 7-10 priorities, which are translated into "state performance measures" that can be used to track a state's progress toward addressing their identified priorities. The state must also develop a five-year plan for meeting these performance measures.[87] Once a state determines its MCH priorities, it is expected to allocate resources to activities that specifically address them. MCH officials recently completed the 2005 process.

**The Year 2000 Needs Assessment Process**

The Year 2000 needs assessment process consisted of four independent activities that together culminated in the identification of seven priorities[aa] and nine associated state performance measures (Exhibit 21).[88,89] The Tennessee MCH Division:

1. Reviewed health status data provided by the Office of Policy, Planning, and Assessment[bb] and identified indicators for which Tennessee rates were higher than the US as a whole.

[aa] Some states prioritize needs according to feasibility of achieving certain goals, financial affordability of goals, or the severity of a particular problem within the state. Research staff were unable to determine, through interviews and literature reviews, how the Tennessee MCH Section prioritizes its needs and hence its performance measures.

[bb] The Department of Health's Office of Policy, Planning and Assessment provides data analysis and research to other divisions within the Department.

2. Reviewed county and regional health reports and identified the top health concerns related to women, infants and children.
3. Reviewed and summarized fourteen needs assessments conducted by other state organizations and advocacy groups.
4. Held statewide stakeholders meetings and county health council meetings in nine counties in which they developed a list of 5-7 health needs for each MCH population.

The review of health status data (Activity 1) revealed a higher rate of poor birth outcomes than the national average. The Community Needs Assessment (Activity 2) identified maternal health needs and poor birth outcomes as issues. The Stakeholder Meeting (Activity 4) identified five women's health needs. However, only one resulting Priority (7) actually focused on the "maternal" population of "maternal and child health" and two focused on infants (Priorities 1 and 2). The resulting official priorities are listed below.

**Exhibit 21: List of State Priorities and Performance Measures for 2000-2005**

| State Priorities and Associated State Performance Measures (SPM) for 2000-2005 | MCH Population Served |
|---|---|
| Priority 1: Birth defects from preventable genetic causes should be prevented | |
| **SPM: After implementation of folic acid education at the state, regional, and local levels, reduce the number of neural tube defects births** | Infants, Newborns |
| Priority 2: Reduce STD infection rates, including HIV infection of infants | |
| **SPM: Reduce the proportion of teens and young adults (ages 15-24) with Chlamydia Trachmomatis infections attending family planning clinics** | Adolescents (age 10-19), Infants, Women |
| **SPM: Reduce the number of HIV infected infants to no more than one per year** | |
| Priority 3: Reduce child abuse and neglect in Tennessee | |
| **SPM: Reduce incidences of maltreatment of children younger than 18 (physical, sexual and emotional abuse and neglect) to rate no more than 8 per 1000.** | Children (age 1-21) |
| Priority 4: Reduce tobacco use in all its forms by adolescents. | |
| **SPM: Reduce the percentage of high school students using tobacco (cigarettes and smokeless)** | Adolescents (age 10-19), Children (age 1-21) |
| Priority 5: Reduce the percentage of high school students using alcohol | |
| **SPM: Reduce the percentage of high school students using alcohol** | Adolescents (age 10-19), Children (age 1-21) |
| Priority 6: Improve the state's EPSDT rates in a managed care system | |
| **SPM: Increase percentage of children with complete Early Periodic Screening, Diagnosis, and Treatment annual examination by 3% each year** | Other |
| Priority 7: Women of all ages and racial groups must seek and use preventive health care services to improve their health status | |
| **SPM: Reduce to no more than 30% the proportion of all pregnancies that are unintended pregnancies** | Pregnant women, Women |
| (No Priority Indicated) | |
| **SPM: Reduce to no more than 4% elevated blood lead levels in children 6-72 months of age who are screened** | Children (age 1-21), Infants |

*Source: U.S. Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau, "State Priority Needs" and "2000 Tennessee State Title V Block Grant Narrative."*

While Priority 7 emphasized the importance of preventive health care, the state performance measure chosen for this priority simply measured the rate of unplanned pregnancies, not the status of women's health in Tennessee.

***It is not likely that Tennessee will reduce its high infant mortality rate unless the state makes a concerted effort to reduce the number of LBW and preterm births.***

The federal MCH Bureau requires states to report their status on 18 National Performance Measures (Appendix VI), two of which are the infant mortality rate and low birth weight rate. The Tennessee MCH Division recognized that infant mortality and LBW rates were higher than the national average, but did not list them as priorities, because, "[a]ny expressed need that was a required national performance measure, such as infant mortality and low birth weight infants, was automatically assumed to be included as a need."[90] However, the resulting priorities did not necessarily reflect an effort to address these 'assumed' needs. Title V rules do not require a state-identified need to be excluded as an official priority simply because it is considered a "National Performance Measure." Other states, such as Alabama, Florida, Georgia, Mississippi, and North Carolina listed reducing infant mortality and low birth weight rates as official priorities.

**The Year 2005 Needs Assessment Process**

The Tennessee Department of Health's Maternal and Child Health Section contracted with Middle Tennessee State University's Center for Health and Human Services to carry out the 2005 needs assessment process from November 2004 through May 2005.[91] The MTSU research team:

1. Searched MCH issue specific websites relevant to the 18 National and eight State Performance Measures and to Healthy People 2010.
2. Surveyed 169 professionals from MCH-related agencies in Tennessee to review the importance of certain MCH-related issues and how well their agencies were addressing those issues.
3. Held 13 focus group meetings with 117 Tennessee MCH clients in 12 cities to evaluate positive and negative experiences with and accessibility of MCH services, and gather opinions on improvement of services and service priorities.
4. Gathered data from all focus group participants to assess the availability and quality of MCH services provided by the state.

Activity 1 revealed that Tennessee performed poorer than the national average on the percentage of very low birth weight infants among all live births and the percentage of infants born to women who received prenatal care beginning in the first trimester.

Activity 2 found little agreement between MCH professionals as to which MCH issues they thought were the "most important" to their communities. However, the survey did determine which issues they considered to be "highly important" and how well they thought their agencies addressed those issues. While many of these were reflected in the new Performance Measures/Priorities, others were not. For example, infant mortality rates, low and very low birth weight babies, early/adequate prenatal care, and preterm birth rates were considered "highly important" issues to a majority of MCH professionals surveyed, yet only one of those issues became an official priority (preterm birth rates).

Activities 3 and 4 were not considered statically representative — and did not appear to influence the resulting State Performance Measures/Priorities — but they revealed response patterns. In Focus Group meetings, maternal and infant health related services important to participants and participant communities reveal a focus on basic prenatal care and home visiting programs. The focus group further revealed that the three primary obstacles in accessing services were language barriers, the ability to pay for services, and knowledge about services and how to get them. In addition, while 52 percent of non-Hispanic White respondents stated that the availability of needed services was "very

good", only 24 percent of African Americans surveyed agreed, illustrating a disparity in the availability, or perceived availability, of services to a particular racial group. However, as previously noted, the results of the Focus Groups were not reflected in the resulting State Performance Measures/Priorities.

From these activities, the Tennessee Department of Health's MCH Section determined the State Performance Measures/Priorities with the assistance of an MCH Advisory Group for 2005-2010 (Exhibit 22). Four new Performance Measures were added, two of which are influenced by pre-pregnancy and prenatal care, yet overall the focus of the state performance measures (and hence priorities) is primarily on child and adolescent health, not on maternal health. However, the new priority focused on reducing the preterm birth rate could have positive effects on reducing infant mortality in Tennessee.

**Exhibit 22: List of State Priorities/Performance Measures for 2005-2010**

| State Priorities/Performance Measures for 2005-2010[92,93] | MCH Population Served |
|---|---|
| **Increase percentage of children with complete Early Periodic Screening, Diagnosis, and Treatment annual examination by 3% each year** | Children (age 1-21), Infants |
| **Increase percentage of adolescents with complete Early Periodic Screening, Diagnosis, and Treatment annual examination by 3% each year*** | Adolescents (age 10-19) |
| **Reduce incidences of maltreatment of children younger than 18 (physical, sexual and emotional abuse and neglect) to rate no more than 8 per 1000.** | Adolescents (age 10-19), Children (age 1-21), Infants |
| **Reduce number of babies born prematurely*** | Infants, Pregnant Women |
| **Reduce the number of pregnant women who smoke and use illicit drugs*** | Pregnant Women |
| **Reduce the number of overweight and obese children and adolescents*** | Adolescents (age 10-19), Children (age 1-21) |
| **Reduce the proportion of teens and young adults (ages 15-24) with Chlamydia Trachmomatis infections attending family planning clinics** | Adolescents (age 10-19), Infants, Women |
| **Reduce the percentage of high school students using tobacco (cigarettes and smokeless)** | Adolescents (age 10-19), Children (age 1-21) |
| **Reduce the percentage of high school students using alcohol** | Adolescents (age 10-19), Children (age 1-21) |
| **Improve the number of youth with special health care needs who transition successfully to adulthood*** | Children with Special Health Care Needs (CSHCN) |
| **** indicates new State Performance Measure*** | |

*Source: Dr. Theodora Pinnock, Director of Maternal and Child Health Section, Tennessee Department of Health; and U.S. Department of Health and Human Services, Title V Information System, "State Priority Needs."*

In addition, neither the 2000 nor the 2005 assessment examined:

- the quality and comprehensiveness of available services
- weaknesses/gaps in collaborative relationships and delivery system coordination
- the internal capacity of the MCH Section or its programs
- geographic availability and distribution of services

### *The Department of Health has not recently evaluated or produced any annual reports on home-visiting programs in Tennessee.*

As previously mentioned, the effects of home visiting programs on low birth weight births and preterm births are uncertain, yet some very positive psychosocial effects have been observed in national studies (see Exhibit 7, page 11). In addition, a 1998 RAND report [94] estimated the cost savings associated with these outcomes over time to be four times the

original investment, due mainly to reductions in criminal justice costs, decreased welfare outlays, increased tax revenues from increased employment of participants, and reduced expenditures for special education, emergency room visits, and stays in homeless shelters.

While the Tennessee Department of Health is aware of the potential benefits of home visiting programs it has not recently evaluated CHAD, Healthy Start or HUGS[95] even though the programs require home visitors to fill out a self-evaluation form that is then sent to the Central Office, regarding whether goals were met with a client. The Department of Health only collects the number of clients served for billing purposes; it has not comprehensively evaluated the effects of home-visiting programs in the state.

Although the Department is expanding the HUGS program, it acknowledges that the available home-visiting programs are not operating at full capacity,[96] i.e., reaching all the people they want to reach with the appropriate services, given the resources available. Exhibit 23 lists the three Tennessee home-visiting programs and the counties that have a particular program. Regular program evaluation could assist the Department in outreach, efficient use of program resources, and further expansion of services.

**Exhibit 23: Tennessee Counties with Home Visiting Services**

| Home-Visiting Program | Counties with Program | | |
|---|---|---|---|
| **Child Health and Development (CHAD)** | **Anderson**<br>**Blount**<br>**Campbell**<br>**Carter**<br>**Claiborne**<br>**Cocke**<br>**Grainger** | **Greene**<br>**Hamblen**<br>**Hancock**<br>**Hawkins**<br>**Jefferson**<br>**Johnson**<br>**Loudon**<br>**Monroe** | **Morgan**<br>**Roane**<br>**Scott**<br>**Sevier**<br>**Washington**<br>**Unicoi**<br>**Union** |
| **Healthy Start (Tennessee)** | **Anderson**<br>**Bedford**<br>**Benton**<br>**Blount**<br>**Carroll**<br>**Chester**<br>**Coffee**<br>**Crockett** | **Davidson**<br>**Gibson**<br>**Henry**<br>**Jackson**<br>**Jefferson**<br>**Knox**<br>**Lake**<br>**Lincoln**<br>**Loudon**<br>**Madison** | **Marshall**<br>**Montgomery**<br>**Moore**<br>**Obion**<br>**Overton**<br>**Putnam**<br>**Shelby**<br>**Stewart**<br>**Weakley**<br>**White** |
| **Help Us Grow Successfully (HUGS)** | *All counties in Tennessee have HUGS, **except** the following:*<br>**Benton**<br>**Bledsoe***<br>**Cheatham***<br>**Chester**<br>**Franklin**<br>**Grundy**<br>**Haywood** | **Henry**<br>**Humphreys***<br>**Marion**<br>**Meigs***<br>**Obion**<br>**Polk***<br>**Robertson*** | **Rhea***<br>**Sequatchie***<br>**Stewart***<br>**Tipton**<br>**Trousdale***<br>**Weakley** |

**Recent expansion of HUGS has made home-visiting available on an "as-needed" basis in these counties*
*Source: Information provided by Dr. Theodora Pinnock, Director, Maternal and Child Health, and Margaret Major, Women's Health Division, Maternal and Child Health, Tennessee Department of Health.*

## Tennessee does not have adequate MCH data collection systems

The maintenance and development of information systems are considered infrastructure-building activities because they help support health care service delivery and program planning by providing accurate health data specific to the state, regions within the state, and certain populations. The integration of MCH data systems could potentially improve health outcomes for MCH populations by enhancing care coordination, program planning and accountability, communication with policymakers, and increased use of preventive health services.[97]

### *Tennessee's MCH Division collects a limited amount of data but does not have direct access to vital records data required for the Title V Block Grant application, other grants, reports, media requests and public inquiries.*

Vital records data[cc] must be obtained through the Department's Office of Policy, Planning and Assessment (OPPA) which provides support and maintenance functions such as data set development, data analysis, and research. [98,99] Perhaps for this reason, the MCH Division provides information on MCH status, needs, and gaps primarily when external requests are made or reports mandated.

Current datasets collected by the Maternal and Child Health Section include:

- Lead surveillance data on children with abnormal blood lead levels
- Patient Tracking Billing Management Information System (PTBMIS) client data on MCH's direct service programs, HUGS, CHAD, WIC and Families First
- Child Fatality Review Teams' data that is received and compiled by MCH, which then produces an formal annual report

### *The federal government has not funded Tennessee's Pregnancy Risk Assessment Monitoring System (PRAMS) grant applications that would have allowed the state to monitor maternal experiences and birth outcomes.*

PRAMS, an ongoing state-specific surveillance system developed in 1987, is a CDC funded program designed to allow states to identify and monitor infant health and maternal behaviors and experiences before, during, and after pregnancy. The 2006 PRAMS grants range between $75,000 and $200,000 per award.[100] The data collected and analyzed informs the development of maternal-infant policy and programs responsive to local and state-specific needs. PRAMS is used in 29 states, including Alabama, Arkansas, Georgia, Louisiana, Mississippi, and South Carolina, and monitors 62 percent of all U.S. births.[101]

However, Tennessee's most recent PRAMS grant application "did not receive a high enough priority to be funded." The CDC identified the following weaknesses:

- "The MCH programs appear to lack coordination."
- "Although there is potential to link to other datasets (TennCare, hospital discharge data set), there appears to be little experience with linking records with other complicated datasets." [102]

[cc] Vital records data sets include birth files, death files, linked birth-death files, hospital discharge data and the birth defects registry.

### *Local health departments and the Tennessee Department of Health lack the infrastructure needed to execute a Fetal and Infant Mortality Review (FIMR) program.*

FIMR programs seek to understand the social, economic, health, and structural factors contributing to fetal and infant deaths, to form recommendations, and to monitor the implementation of these recommendations. FIMR facilitates improvements in systems of health care for pregnant women and infants.

Tennessee's Child Fatality Review and Prevention Act (*T.C.A.* 68-142) mandates the review of "all deaths of children seventeen (17) years of age or younger." However, under this statute, deaths associated with prematurity are considered natural deaths, and as such are not reviewed. Given that most infant deaths in Tennessee are linked to premature births, the current statute limits the state's collection of the information needed to understand and address the causes of this trend.

In addition, the Child Fatality Review statute forbids contact with the parent, which prevents the collection of maternal health information. Regional Fetal and Infant Mortality Review teams would give Tennessee the structure to review infant deaths associated with prematurity and gather information on maternal health.

### *Although not required by law, if the Perinatal Regionalization System were to perform ongoing data collection, monitoring and evaluation, Tennessee could benefit by having access to information related to system-wide needs.*

Because Tennessee has a regional system of perinatal care, a mother or newborn infant who is experiencing severe complications will ideally have access to specialists that have the skills, knowledge and equipment that can give both of them the best possible chance of survival.[103] The availability and accessibility of maternal-fetal medicine specialists in the regional centers enhances the quality of care provided. (For background on the Perinatal Regionalization System, refer to pages 14-15.)

The Perinatal Advisory Committee and its subcommittees[dd] are primarily responsible for advising the Department of Health on high risk perinatal care and regionalization and developing high risk perinatal care guideline manuals.[ee,104] However, the system is not monitored, evaluated, tracked or enforced — no regulatory board or enforcement mechanism exists. While lack of regulation may give the perinatal centers more flexibility to serve the maternal and infant populations, a lack of system-wide monitoring, tracking and evaluation deprives stakeholders — such as health care providers, the Department of Health, and state lawmakers — of vital information about needs, service and provider shortages and areas in which improvement and assistance are needed. For example, there is no data on problems related to transporting mothers or neonates, one of the key components of regionalization and access to care.

***Shortage of data.*** In 1977, the Data Subcommittee of the Tennessee Perinatal Advisory Committee was charged with developing a standardized perinatal data collection and evaluation system and in 1980 contracted with Vanderbilt University to develop a blueprint for its implementation. Researchers began collecting data in January 1982 and

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[dd] The subcommittees of the Tennessee Perinatal Advisory Committee are the Data Subcommittee; the Liaison, Legislative and Funding Subcommittee; Regionalization, Care Levels and Professional Education Subcommittee; and Perinatal Transportation Subcommittee

[ee] Four of these manuals are currently being used in the system as guidelines: *Guidelines for Regionalization, Hospital Care Levels, Staffing and Facilities* (2004, 5th edition); *Educational Objectives in Medicine for Perinatal Social Workers* (August 2004, 4th edition);*Guidelines for Transportation, Educational Objectives for Nurses Level I, II, III, Neonatal Transport Nurses* (January 2004, 3rd edition); *Educational Objectives for Emergency Medical Technicians/Paramedics* (last edition was in 1981 and information was combined with the Guidelines for Transportation). Another manual, *Outline of Courses for Physicians*, was retired by the PAC in 1992.

produced annual reports between 1983 and 1988. However, TDOH personnel currently involved in the Perinatal Regionalization System speculate that a loss of funding contributed to the demise of that data collection project. In addition, the Data Subcommittee, also charged with making recommendations for further data needs, has been inactive for several years.

Currently, data that the five regional centers do collect for their own specific activities and needs is not compiled in a central location or database, nor analyzed in a system-wide framework on a regular basis, such as an annual report. In addition, information to evaluate the quality of perinatal care in Tennessee would be required from all providers and facilities, not just the five regional centers. Because there is no standardized system of monitoring and evaluation, availability of hospital-level data regarding the perinatal system would not be consistent across all hospitals in the system.

Tennessee does not have a clear picture of the services provided to (and those still needed for) high-risk mothers and neonates because data from the five Regional Perinatal Centers is not streamlined, collected, nor analyzed at the state level. In addition, the Liaison, Legislation and Funding Subcommittee of the Perinatal Advisory Committee was originally charged with monitoring legislation and advising on the funding mechanism for the regional centers, part of the planning and funds distribution process. That subcommittee is now inactive and the state has not increased funding to the perinatal regionalization system since 1991, possibly hindering data collection efforts.

**Effect of Managed Care Organization (MCO) networks on the regionalization system in Tennessee is unknown.** While regional perinatal networks have been credited as a major vehicle for the reduction in neonatal mortality rates over the last several decades,[105] managed care organizations may overlook the established perinatal regional networks in favor of MCO payer-provider negotiations. MCOs may direct obstetric care into lower level hospitals with lower operating costs, rather than more expensive Neonatal Intensive Care Units in higher level facilities.[106] While each TennCare contract with a managed care organization requires a formal arrangement with the appropriate Perinatal Center in the specific geographic area, the Perinatal Advisory Committee has not studied how the participation of specific providers within a network may influence the transfer of patients and how MCO transportation networks are matching up with perinatal regionalization networks in Tennessee. If MCO provider networks are transferring patients to lower-cost, lower level hospitals instead of within the perinatal regions to higher level hospitals, it could be potentially detrimental to the health of high-risk mothers and neonates.

# RECOMMENDATIONS

***Tennessee is unlikely to improve its current level of infant health – in the bottom 10 percent nationally – unless the state reframes poor birth outcomes as a social problem with health consequences.***

***Tennessee will likely not reduce the extra demands on resources to care for the surviving infants with lifelong health problems and developmental disabilities unless the state reframes maternal and child health as an issue of women's health regardless of pregnancy status.***

### *Conditions and Observations in Brief*

***Conclusion: Poor maternal health affects infant health, leading to long-term health issues with high costs for Tennessee***

**Condition 1:** Tennessee ranks 48th in the country in infant mortality, 46th in low birth weight births, and 46th in preterm births (p. 17)

**Condition 2:** Poor birth outcomes increase health spending (p. 19)

**Condition 3:** Poor birth outcomes increase education spending (p. 20)

***Conclusion: Tennessee's maternal and infant health care system lacks human, financial and structural resources***

**Condition 4:** In 2003, 15 of Tennessee's 95 counties reported having no obstetric provider. (p. 21)

**Condition 5:** Tennessee does not address all MCH populations equally with available limited resources (p. 24)

**Condition 6:** Tennessee lacks a broad-based, long-term focus on reducing poor birth outcomes (p. 26)

**Condition 7:** Tennessee does not have adequate MCH data collection systems (p. 33)

**LEGISLATIVE RECOMMENDATIONS:**

**The General Assembly may wish to create an Obstetrical Care Task Force modeled after Virginia's Governor's Work Group on Rural Obstetrical Care[ff] or Delaware's Infant Mortality Task Force[gg] to discuss potential strategies for protecting the availability of health care services in rural areas and for low-income residents.** The Task Force may wish to examine how the following issues are affecting the availability of this care (Conditions 4, 5, 6):

- **Barriers to accessing preconception, prenatal and interconception care for populations disproportionately affected by infant mortality and low weight births (i.e., certain age groups, racial groups, those living in regions of the state with higher rates, the uninsured or underinsured, etc.)**

- **Allocating financial and human resources to designated obstetric shortage areas:** For example, the task force may wish to research innovative programs/best practices in other states that address OB/GYN shortages.

[ff] The Report of the Governor's Work Group on Rural Obstetrical Care to the Governor and the General Assembly of Virginia may be accessed at http://leg2.state.va.us/dls/h&sdocs.nsf/By+Year/HD522004/$file/HD52.pdf

[gg] *"Reducing Infant Mortality in Delaware: The Task Force Report",* May 2005, may be accessed at http://www.dhss.delaware.gov/dhss/dph/files/infantmortalityreport.pdf

- **Allocating resources for women's health as a way to reduce poor birth outcomes:** The Task Force may wish to review best practices from other states that combine a focus on women's health with a focus on birth outcomes.

- **Best practices for reducing poor birth outcomes for low-income populations and rural populations**

- **Medical liability insurance premiums:** While it is not possible to accurately predict how much capping non-economic damages would decrease physician liability premiums, states that have implemented such laws have seen medical liability premiums stabilize or decrease and have experienced retention of OB-GYN providers.

  The Task Force may consider establishing a medical liability insurance premium subsidy program for sole community hospitals and obstetricians whose practice includes a specified percentage of TennCare and uninsured patients.

- **Third party reimbursement rates:** For example, Virginia increased Medicaid payments for obstetric care by 34 percent in September 2004. This increase raised Medicaid payments to approximately 80 percent of the average commercial rates paid for these services.[107] Wyoming also increased rates for the delivery of a child, including prenatal and postpartum care related to the delivery, in July 2004. The new rate is "at least 90 percent of the statewide average of the physician's specialty for the services provided."[108]

  Eligibility for such rates could consider provider location and percentage of TennCare and uninsured patients.

Every two years the study committee or relevant Departments (i.e., Health, Commerce and Insurance, etc.) should make a report on whatever measures are ultimately adopted to the Governor and General Assembly.

**The General Assembly may wish to consider additional funding for the Office of Women's Health.** This Office was created in 2000 with in existing resources, and it remains essentially unfunded. Funding could allow the OWH to add a specific focus on women of reproductive age. (Conditions 1 and 5)

**ADMINISTRATIVE RECOMMENDATIONS:**

**The Tennessee MCH Section should make the reduction of infant mortality and low birth weight rates priorities and carry out relevant program activities with these priorities in mind.** (Conditions 1 and 6)

**The Tennessee Department of Health should enhance data collection relevant to maternal and infant health**. Data analysis is vital to making informed decisions about resource allocation and targeting interventions to populations at highest risk for poor birth outcomes. (Conditions 1, 6, 7)

- **Establish regional Fetal Infant Mortality Review teams[hh], similar to the state's Child Fatality Review teams (*T.C.A.* 68-142), to understand the social, economic, health, and structural factors contributing to fetal and infant deaths, to form recommendations, and to monitor the implementation of these recommendations.**

[hh] An August 2005 report outlining Delaware's recent implementation of a statewide FIMR and its implications may be accessed at http://www.dhss.delaware.gov/dhss/dph/files/fimr.pdf.

- **The Department of Health should conduct a Perinatal Periods of Risk (PPOR) analysis of fetal and infant deaths statewide and in each health region.** The results should guide the implementation of targeted prevention strategies based on leading contributors to infant death.

- **The Department of Health should address the weaknesses of the 2001 Pregnancy Risk Assessment Monitoring System (PRAMS) grant application and re-apply.** Funding would allow the state to monitor maternal behaviors and experiences before, during, and after pregnancy and the resulting infant health. The data collected and analyzed would inform the development of maternal-infant policy and programs responsive to local and state-specific needs.

- **The Department of Health should evaluate the effects of current home visiting programs and review best practices in other states.** The Department may wish to evaluate number of clients served, associated birth outcomes, long-term cost savings, funding options, etc., utilizing the evaluation to consider and garner support for expansion of home visiting services.

- **The Department of Health may wish to revive a data collection/analysis project for the Perinatal Regionalization System much like the one undertaken in partnership with Vanderbilt University in the 1980s.** To these ends, the Perinatal Advisory Committee may wish to reinstate the Data Subcommittee and the Liaison, Legislation and Funding Subcommittee to advise the Department of Health on ways to support and fund such a data collection and analysis project.

**The Maternal and Child Health Division should consider formally working with both the Office of Rural Health and the Office of Disparity Elimination, to assess the geographic availability and distribution of women's health and maternal and infant health services and use the information to inform the MCH needs assessment process.** (Conditions 5, 6, 7)

**The Department of Health should reconsider its allocation of resources for programs and services for women of reproductive age.** Maternal and Child Health (MCH) and the Office of Women's Health (OWH) are the two TDOH divisions that would most logically serve women of reproductive age. However, MCH expenditures emphasize programs for children and OWH's purpose emphasizes post-menopausal women. TDOH should build a women's preconception health focus into one of these offices or combine programs around such a focus, and allocate resources accordingly. (Condition 5)

**The Department of Health should allocate more resources and place greater emphasis on building the infrastructure of MCH programs.** MCH infrastructure includes monitoring and evaluation, needs assessments, planning, policy development, and information/data systems. (Conditions 6 and 7) The MCH Section should also consider examining the quality and comprehensiveness of available services, weaknesses in delivery system coordination, and the internal capacity of the MCH Section and its programs.

**The Department of Health should consider increasing the grant-writing expertise of its divisions, as they have been unsuccessful in securing some key federal funding opportunities.** The Department may choose to provide grant-writing training to enhance the identification of federal and foundation grants for which Tennessee would qualify and to garner funding for needs identified by the MCH Division. (Conditions 5 and 7)

**The Department of Health should consider monitoring its Maternal and Child Health programs using more innovative State Performance Measures to address infant mortality, low weight and preterm births in Tennessee.** Noteworthy examples of Performance Measures in other states include (Condition 6):

- “The extent to which perinatal health disparities are addressed at the state and local levels, collaboratively with stakeholders and community partners” (Massachusetts).
- “Number of community/neighborhood partnerships begun in 5 targeted counties to identify perinatal disparities” (Indiana).
- “Increase the number of health departments who implemented a review process for fetal and infant deaths” (South Carolina).
- “Percent of state fetal and infant deaths reviewed by a Feto-Infant Mortality Review (FIMR)” (Louisiana).
- “Excess feto-infant mortality attributed to the maternal health/prematurity category in the PPOR statewide analysis” (Florida).
- “Percentage of women of childbearing age who receive preconceptual care in local health departments” (Kentucky).
- “The degree to which the Bureau of Family Health Services collects, analyzes, and disseminates findings from data pertinent to ongoing maternal and child health (MCH) needs assessment” (Alabama).
- “Increase the number of MCH programs that utilized research findings to better target programs to vulnerable populations” (South Carolina).

**The Bureau of TennCare may wish to include coverage of smoking cessation services as part of the core set of benefits offered to all pregnant women.** As of 2002, 25 states cover smoking cessation counseling services or programs either specifically for pregnant women covered by Medicaid or for the entire Medicaid population.

# APPENDICES

## APPENDIX I: TENNESSEE HEALTH REGIONS

| West Region | South Central | Southeast | East |
|---|---|---|---|
| Benton | Bedford | Bledsoe | Anderson |
| Carroll | Coffee | Bradley | Blount |
| Chester | Giles | Franklin | Campbell |
| Crockett | Hickman | Grundy | Claiborne |
| Decatur | Lawrence | Marion | Cocke |
| Dyer | Lewis | McMinn | Grainger |
| Fayette | Lincoln | Meigs | Hamblen |
| Gibson | Marshall | Polk | Jefferson |
| Hardeman | Maury | Rhea | Loudon |
| Hardin | Moore | Sequatchie | Monroe |
| Haywood | Perry | | Morgan |
| Henderson | Wayne | | Roane |
| Henry | | | Scott |
| Lake | | | Sevier |
| Lauderdale | | | Union |
| McNairy | | | |
| Obion | | | |
| Tipton | | | |
| Weakley | | | |

| Mid-Cumberland | Upper Cumberland | Northeast | Metro |
|---|---|---|---|
| Cheatham | Cannon | Carter | Davidson |
| Dickson | Clay | Greene | Hamilton |
| Houston | Cumberland | Hancock | Knox |
| Humphreys | DeKalb | Hawkins | Madison |
| Montgomery | Fentress | Johnson | Shelby |
| Robertson | Jackson | Unicoi | Sullivan |
| Rutherford | Macon | Washington | |
| Stewart | Overton | | |
| Sumner | Pickett | | |
| Trousdale | Putnam | | |
| Williamson | Smith | | |
| Wilson | Van Buren | | |
| | Warren | | |
| | White | | |

## APPENDIX II: BIRTH OUTCOMES RANK AMONG 50 LARGEST U.S. CITIES AND 50 STATES, 2002

| Indicator | 2000 | | | 2001 | | | 2002 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Rank | Location | Percent | Rank | Location | Percent | Rank | Location | Percent |
| Percent of total births to teens | 20 | Nashville | 12.8 | 21 | Nashville | 12.2 | 18 | Nashville | 11.6 |
| | 47 | Memphis | 19.4 | 46 | Memphis | 18.2 | 45 | Memphis | 17.6 |
| | 43 | Tennessee | 14.7 | 42 | Tennessee | 14.1 | 42 | Tennessee | 13.5 |
| Percent of teen births to women who were already mothers | 37 | Nashville | 24.5 | 40 | Nashville | 25.3 | 29 | Nashville | 23.2 |
| | 49 | Memphis | 29.4 | 50 | Memphis | 28.0 | 50 | Memphis | 28.4 |
| | 39 | Tennessee | 22.0 | 38 | Tennessee | 21.1 | 44 | Tennessee | 22.1 |
| Percent of total births to unmarried women | 22 | Nashville | 39.6 | 21 | Nashville | 39.9 | 22 | Nashville | 40.9 |
| | 45 | Memphis | 62.5 | 45 | Memphis | 62.9 | 45 | Memphis | 62.4 |
| | 33 | Tennessee | 34.5 | 38 | Tennessee | 35.7 | 38 | Tennessee | 36.2 |
| Percent of total births to mothers with less than 12 years of education | 22 | Nashville | 25.1 | 23 | Nashville | 25.4 | 20 | Nashville | 24.9 |
| | 29 | Memphis | 27.7 | 30 | Memphis | 28.3 | 30 | Memphis | 28.9 |
| | 37 | Tennessee | 21.5 | 36 | Tennessee | 21.5 | 36 | Tennessee | 21.3 |
| Percent of total births to mothers receiving late or no prenatal care | 18 | Nashville | 3.9 | 8 | Nashville | 2.9 | 10 | Nashville | 2.7 |
| | 49 | Memphis | 10.1 | 48 | Memphis | 10.5 | 49 | Memphis | 10.1 |
| | 38 | Tennessee | 4.2 | 37 | Tennessee | 4.1 | 37 | Tennessee | 3.9 |
| Percent of total births to mothers who smoked during pregnancy | 22 | Memphis | 8.8 | 22 | Memphis | 8.2 | 22 | Memphis | 7.3 |
| | 24 | Nashville | 10.2 | 27 | Nashville | 10.8 | 27 | Nashville | 10.5 |
| | 35 | Tennessee | 17.0 | 35 | Tennessee | 17.2 | 35 | Tennessee | 17.1 |
| Percent low-birthweight birhts | 35 | Nashville | 9.2 | 33 | Nashville | 9.1 | 31 | Nashville | 9.1 |
| | 48 | Memphis | 12.8 | 46 | Memphis | 12.0 | 45 | Memphis | 12.3 |
| | 46 | Tennessee | 9.2 | 45 | Tennessee | 9.2 | 45 | Tennessee | 9.2 |
| Percent preterm births | 34 | Nashville | 13.7 | 36 | Nashville | 13.7 | 17 | Nashville | 12.2 |
| | 46 | Memphis | 17.3 | 45 | Memphis | 16.5 | 47 | Memphis | 17.0 |
| | 46 | Tennessee | 13.5 | 47 | Tennessee | 14.0 | 46 | Tennessee | 13.8 |

Source: The Annie E. Casey Foundation, *The Right Start for America's Newborns: City and State Trends*, 2003, 2004, and 2005 Editions.

## APPENDIX III: HOSPITALS PARTICIPATING IN PERINATAL REGIONALIZATION SYSTEM

**The following table indicates the number of hospitals designated as providing a certain level of service between 2001 and 2004.**

| Self-designated level | 2004 | 2003 | 2002 | 2001 |
|---|---|---|---|---|
| **Level III**<br>*Provides care for the most complex and severe maternal and neonatal illnesses* | 10 | 12 | 13 | 10 |
| **Level IIB**<br>*Provides care for more complex maternal and neonatal abnormalities* | 17 | 15 | 24 | 9 |
| **Level IIA**<br>*Provides care for maternal and neonatal patients whose courses are uncomplicated and do not require specialized services* | 21 | 23 | 13 | 29 |
| **Level I**<br>*Provides basic care for uncomplicated maternity and neonatal patients* | 33 | 31 | 34 | 36 |
| **Designated Total** | **81** | **81** | **84** | **84** |

**The following counties do not have a hospital that participates in the Perinatal Regionalization System.**

Benton
Bledsoe
Cannon
Cheatham
Chester
Claiborne
Clay
Coffee
Crockett
Decatur
Fayette
Grainger
Grundy
Hancock
Hardeman
Hawkins
Haywood
Hickman
Houston
Humphreys
Jackson
Johnson
Lake
Lauderdale
Lewis
Loudon
Macon
Marion
Marshall
Meigs
Moore
Morgan
Perry
Pickett
Polk
Rhea
Roane
Sequatchie
Stewart
Trousdale
Unicoi
Union
Van Buren
Wayne

*2004 Joint Annual Report (JAR) of Hospitals with Similar Information from the 2001-2003 JAR of Hospitals, Information supplied by the Division of Health Statistics, Office of Policy, Planning and Assessment, Tennessee Department of Health on July 26, 2005*

# APPENDIX IV: COMMUNITY INITIATIVE GRANT RECIPIENTS

## *Community Initiative Projects: Focus on Maternal and Infant Care*[109]

**Grant Recipient**: Chattanooga/Hamilton County Health Department Phase II
**Project:** Prenatal Services for Spanish-speaking Hispanic population and low-income women
**Description of 2004-2005 Activities:** The grant helped the health department enroll 145 Hispanic women in the prenatal program, quadrupling enrollment goals. The project also established an Obstetric Case Manager Position in the health department and provided translation services. However, as a result, the caseload has been significantly increased and clients are being referred to other Health Department sites.

**Grant Recipient:** Natchez Trace Maternity Center
**Project:** Prenatal Initiative
**Description of 2004 Activities:** The grant has helped increase access to care and hence the number of visits for prenatal care, as well as the number of mothers who initiate breastfeeding at birth.

**Grant Recipient:** Putnam County Government
**Project:** Prenatal and Postpartum Initiative
**Description of 2004 Activities:** The project provided 133 women with prenatal care in 2004, provided postpartum participants with family planning services, and added a second home visitor who also acts as a translator.

**Grant Recipient:** TennCorp Community Services Volunteers, Inc.
**Project:** MOM's VIP
**Description of 2004 Activities:** The project provided 15 gift boxes for new mothers, established a cooperative referral process with the Lisa Ross Birthing Center, provided information to families regarding DCS services and established a volunteer-recruitment process.

## APPENDIX V: PERINATAL PERIODS OF RISK (PPOR): A TOOL FOR PRIORITIZING PREVENTION ACTIVITIES[110]

Developed by the Centers for Disease Control and Prevention, PPOR offers a new paradigm for approaching infant mortality data analysis. Watching trends in the overall infant mortality rate does not help a community target specific contributors to the rate. The PPOR framework helps communities identify the leading contributors to the overall feto-infant mortality rate.[ii] Communities can then develop specific infant mortality interventions based on the resulting prioritization of contributing factors.

The PPOR process begins with a two-dimensional feto-infant mortality "map" consisting of birth weight and age at death. Each age/birth weight cluster is identified by the primary prevention target for deaths in that group:

**Feto-infant Mortality Map: Prevention Categories**

| | Fetal (24+ weeks) | Neonatal (0-28 days) | Post Neonatal (28-364 days) |
|---|---|---|---|
| 500-1,500 grams | **Maternal Health/Prematurity** | | |
| 1,500+ grams | **Maternity Care** | **Newborn Care** | **Infant Health** |

Once the proper data is secured, each death is entered into the proper prevention cluster and the results reveal which prevention efforts could have the largest impact. An infant weighing 2,000 grams (4.4 pounds) at birth who dies at six months old is categorized as Infant Health, while an infant weighing 1,000 grams (2.2 pounds) at birth who dies after two weeks in neonatal intensive care is categorized as Maternal Health/Prematurity. The feto-infant mortality rate is then calculated for each cluster.

The model helps communities rank the four factors' contributions to the overall infant mortality rate. The following results are from a PPOR analysis conducted by the Memphis-Shelby County Health Department:

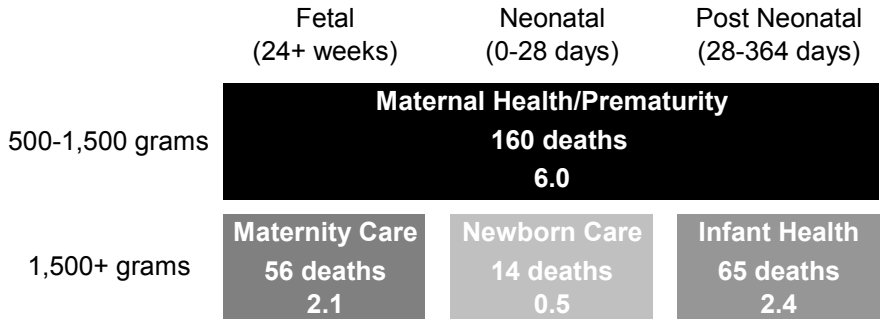
**Feto-infant Mortality Map: Number of Deaths and Mortality Rates for All Races, Shelby County, 1999-2001**[111]

| | Fetal (24+ weeks) | Neonatal (0-28 days) | Post Neonatal (28-364 days) |
|---|---|---|---|
| 500-1,500 grams | **Maternal Health/Prematurity**<br>**251 deaths**<br>**5.8** | | |
| 1,500+ grams | **Maternity Care**<br>**152 deaths**<br>**3.5** | **Newborn Care**<br>**71 deaths**<br>**1.6** | **Infant Health**<br>**133 deaths**<br>**3.1** |

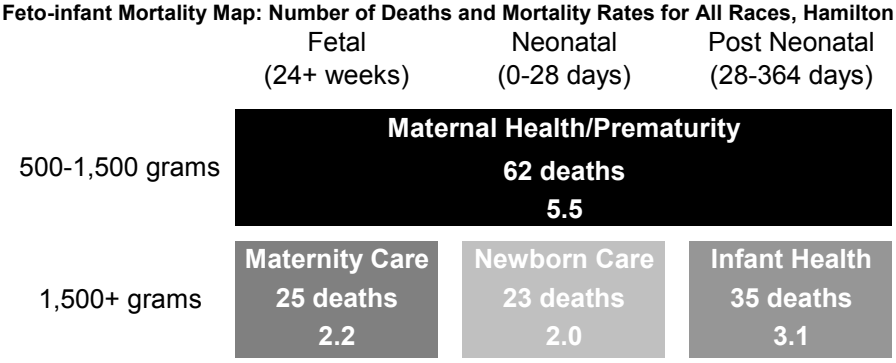
[ii] Fetal mortality is the death of an infant in utero. The feto-infant mortality rate combines the fetal and infant mortality rates into one measure that gives a more accurate reflection of death among the youngest population in the community.

The Metropolitan Public Health Departments Davidson and Hamilton Counties had similar results:

**Feto-infant Mortality Map: Number of Deaths and Mortality Rates for All Races, Davidson County, 2000-2002**[112]




**Feto-infant Mortality Map: Number of Deaths and Mortality Rates for All Races, Hamilton County, 1999-2001**[113]



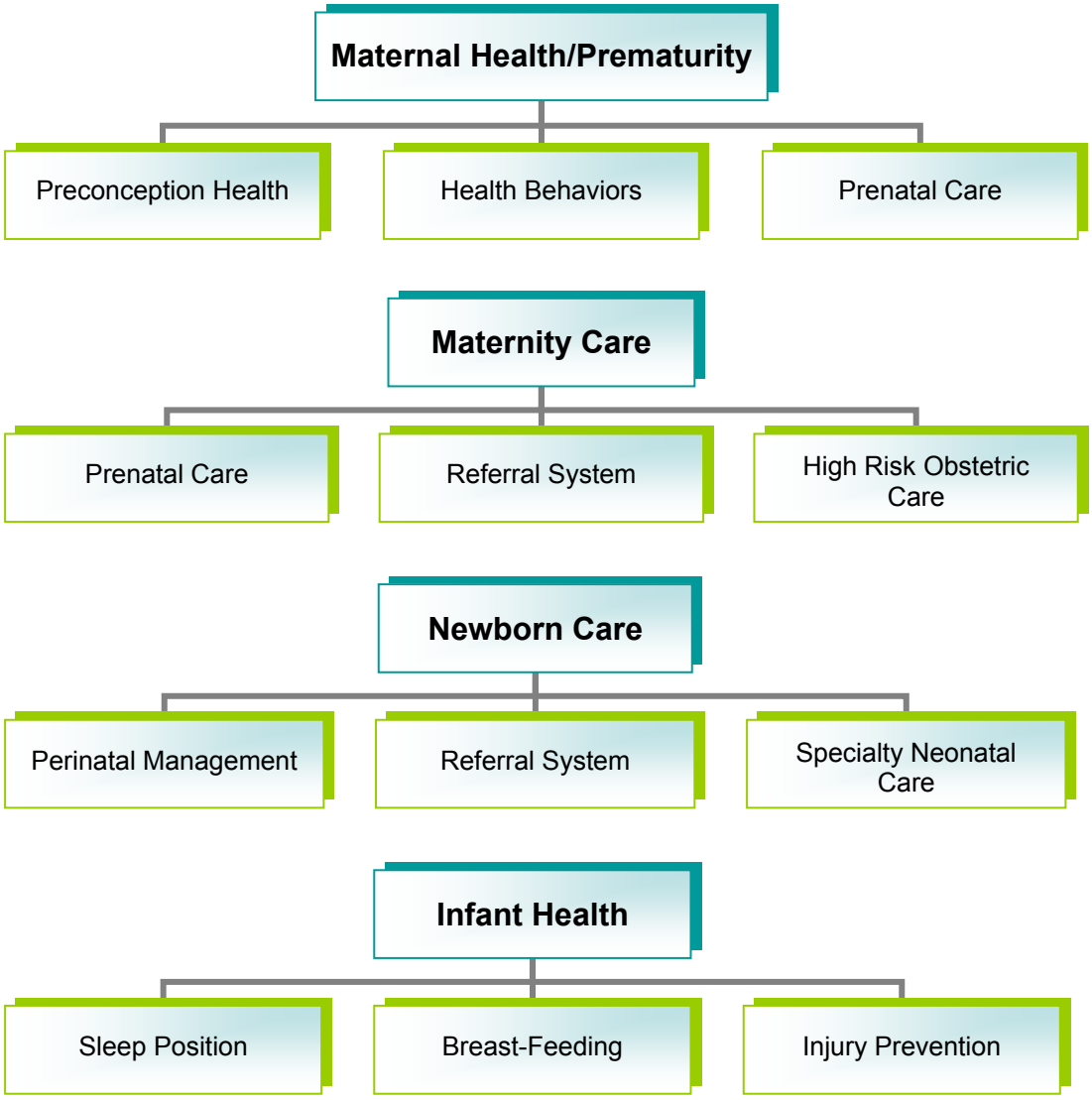

The mother's health prior to and between pregnancies is the leading contributor to infant death in Shelby, Davidson, and Hamilton Counties. When the categorical rates are broken down by race and education, the effects of Maternal Health and Prematurity increase among African American women and are more influential among women with less than 13 years of education.

**Feto-infant Mortality Rates per 1,000 Live Births and Fetal Deaths by Maternal Age, Race, and Education Groups, Davidson County, 2000-2002**[114]

| | Maternal Health | Maternal Care | Newborn Care | Infant Health | Total Rate |
|---|---|---|---|---|---|
| **All** | 6 | 2.1 | 0.5 | 2.4 | 11.1 |
| **White** | 2.6 | 1.6 | 1.6 | 2 | 7.9 |
| **Non-White** | 6.2 | 2.9 | 1.9 | 2.8 | 13.9 |
| **Black** | 7.3 | 2.9 | 2.2 | 3 | 15.4 |
| **< 20 years** | 3.7 | 1.5 | 3.1 | 3.4 | 11.8 |
| **>= 20 years** | 6.3 | 2.2 | 0.2 | 2.3 | 11.0 |
| **>=20 years, <13 years of education** | 4.2 | 2.6 | 1.7 | 2.8 | 11.3 |
| **>=20 years, >= 13 years of education** | 2.7 | 1.0 | 1.4 | 1.6 | 6.7 |

Each age/birth weight cluster suggests a path for prevention which allows a community to tailor interventions to their total population and subgroup needs.

**PPOR Prevention Map**




Given that the highest infant mortality rate is associated with maternal health, the PPOR prevention map indicates that efforts focused on improved preconception health, healthy pregnancy behaviors, and timely prenatal care would have the largest impact on Tennessee's infant mortality rate. Given that infant care is the smallest contributor to mortality, efforts within the neonatal health care system should be maintained but should no longer be the central platform for interventions.

## APPENDIX VI: TITLE V NATIONAL PERFORMANCE MEASURES

The federal Maternal and Child Health Bureau states that "a *Performance Measure* describes a specific maternal and child health need that, when successfully addressed, can lead to a better health outcome within a specific time frame." The tables in this Appendix display data for the most recent year reported.

**The 18 National Performance Measures**

Each year, every state measures their progress toward achieving the targets they set for the following National Performance Measures. Listed in this table are targets set by Tennessee ("Tennessee's 2003 Annual Objective) and how close Tennessee came to achieving or surpassing their goals ("Tennessee's 2003 Performance Data").

| National Performance Measure | Tennessee' 2003 Annual Objective | Tennessee's 2003 Performance Data |
|---|---|---|
| **#01**<br>The percent of newborns who are screened and confirmed with condition(s) mandated by their State-sponsored newborn screening programs (e.g., phenylketonuria and hemoglobinopathies) who receive appropriate follow up as defined by their state. | **100%** | **100%** |
| **#02**<br>The percent of children with special health care needs age 0 to 18 years whose families partner in decision making at all levels and are satisfied with the services they receive. (CSHCN survey) | **94.5%** | **59.3%** |
| **#03**<br>The percent of children with special health care needs age 0 to 18 who receive coordinated, ongoing, comprehensive care within a medical home. (CSHCN Survey) | **94.5%** | **60%** |
| **#04**<br>The percent of children with special health care needs age 0 to 18 whose families have adequate private and/or public insurance to pay for the services they need. (CSHCN Survey) | **94.5%** | **62%** |
| **#05**<br>Percent of children with special health care needs age 0 to 18 whose families report the community-based service systems are organized so they can use them easily. (CSHCN Survey) | **94.5%** | **80%** |
| **#06**<br>The percentage of youth with special health care needs who received the services necessary to make transition to all aspects of adult life. (CSHCN Survey) | **94.5%** | **25%** |
| **#07**<br>Percent of 19 to 35 month olds who have received full schedule of age appropriate immunizations against Measles, Mumps, Rubella, Polio, Diphtheria, Tetanus, Pertussis, Haemophilus Influenza, and Hepatitis B. | **90%** | **78.4%** |
| **#08**<br>The rate of birth (per 1,000) for teenagers aged 15 through 17 years. | **27** | **27.8** |
| **#09**<br>Percent of 3rd grade children who have received protective sealants on at least one permanent molar tooth. | **17%** | **9.3%** |

| | | |
|---|---|---|
| **#10**<br>The rate of deaths to children aged 14 years and younger caused by motor vehicle crashes per 100,000 children. | **3.7** | **4.0** |
| **#11**<br>Percentage of mothers who breastfeed their infants at hospital discharge. | **62%** | **62%** |
| **#12**<br>Percentage of newborns who have been screened for hearing before hospital discharge. | **98%** | **97%** |
| **#13**<br>Percent of children without health insurance. | **7%** | **7.5%** |
| **#14**<br>Percent of potentially Medicaid-eligible children who have received a service paid by the Medicaid Program. | **100%** | **100%** |
| **#15**<br>The percent of very low birth weight infants among all live births. | **1.5%** | **1.7%** |
| **#16**<br>The rate (per 100,000) of suicide deaths among youths aged 15 through 19. | **7** | **6.2** |
| **#17**<br>Percent of very low birth weight infants delivered at facilities for high-risk deliveries and neonates. | **80%** | **74.8%** |
| **#18**<br>Percent of infants born to pregnant women receiving prenatal care beginning in the first trimester. | **89%** | **80.6%** |

**The Six National Outcomes Measures**

States may also report on six National Outcome Measures. The federal Maternal and Child Health Bureaus describes an outcome measure as "the desired result of Title V program activities and interventions." Again, as in the preceding tables, this table lists targets set by Tennessee ("Tennessee's 2003 Annual Objective) and how close Tennessee came to achieving or surpassing their goals ("Tennessee's 2003 Performance Data").

| National Outcome Measure | Definition | Tennessee' 2003 Annual Objective | Tennessee's 2003 Performance Data |
|---|---|---|---|
| **#01** | The infant mortality rate per 1000 live births | **7.7** | **9.2** |
| **#02** | The ratio of the black infant mortality rate to the white infant mortality rate | **2.2** | **2.6** |
| **#03** | The neonatal mortality rate per 1000 live births | **4.5** | **6.0** |
| **#04** | The postneonatal mortality rate per 1000 live births | **2.8** | **3.2** |
| **#05** | The perinatal mortality rate per 1,000 live births plus fetal deaths | **8.5** | **8.1** |
| **#06** | The child death rate per 100,000 children aged 1 through 14 | **18** | **24** |

## APPENDIX VII: PEOPLE INTERVIEWED FOR THIS REPORT

Dr. David Adair, Vice Chair
Tennessee's American College of Obstetricians and Gynecologists (ACOG)
University of Tennessee – Chattanooga

Judith Black, RN, Director of Disease Management
Bureau of TennCare

Chris Clarke, Senior Vice President
Clinical and Professional Practices
Tennessee Hospital Association

Barbara Clinton, Director
Center for Health Services
Vanderbilt University

Dean Daniel, Fiscal Director
Bureau of Health Services
Tennessee Department of Health

Michael Drescher, Director of Public Affairs
Bureau of TennCare

Pramod Dwivedi, Director
Epidemiology
Tennessee Department of Health

John E. Duncan, Jr., Manager
P&C Rating
Property and Casualty Filings
Tennessee Department of Commerce and Insurance

Aimee Edmondson
The Commercial Appeal

Dr. Paul Erwin, Regional Director,
East Tennessee Regional Health Office
Tennessee Department of Health

Charlotte Forkum, Administrator
Upper Cumberland Primary Care Project

Jack Fosbinder, Legal Counsel
State Volunteer Mutual Insurance Company

Dr. Rae Grad, Director of Federal Relations
University of Maryland
Former director of the National Commission to Prevent Infant Mortality and the Southern Regional Task Force on Infant Mortality

Christi Granstaff, Coordinator
Community and Government Relations
Tennessee Primary Care Association

Dr. Connie Graves, Director
Maternal-Fetal Medicine
Vanderbilt Medical Center

Ruth Hagstrom, Medical Director
Health Services Bureau
Tennessee Department of Health

Annette Haley, Assistant Regional Director
Mid-Cumberland Regional Health Office
Tennessee Department of Health

Pearl Hann, Director
March of Dimes, Tennessee Chapter

Dr. Nancy Hardt, Director
Institute for Women's Health
University of Tennessee Health Science Center

Jody Hatz, Policy Specialist
Health Program
National Conference of State Legislatures

Coit C. Holbrook, Director
Actuarial Services Section
Department of Commerce and Insurance

Judith Holden, Assistant Regional Director
Northeast Regional Health Office
Tennessee Department of Health

Suellen Joyner, Regional Director
South Central Regional Health Office
Tennessee Department of Health

Larry Knight
Assistant Commissioner for Insurance
Department of Commerce and Insurance

David Law, Director
Tennessee Birth Defects Registry
Tennessee Department of Health

Nancy Lawhead
Assistant to Mayor for Health Policy
Shelby County Mayor's Office

Barbara Laymon,
Chattanooga-Hamilton Health Department

Peggy Lewis
WIC Director
Tennessee Department of Health

Patrick Lipford, Director
Office of Rural Health and Health Access
Tennessee Department of Health

Dr. Wendy Long, Medical Director
Bureau of TennCare

Margaret Major, Director
Women's Health Division
Maternal & Child Health
Tennessee Department of Health

Alisa Malone, Director
Community Services Section
Tennessee Department of Health

Cindy Mayer
Tennessee Early Intervention System

Mark McCalman, Chief Epidemiologist
Sullivan County Regional Health Department

LaDonna McDaniel-Merville
Vice President
Hospital Alliance of Tennessee

Dr. Brook McKelvey
Maternal and Child Health Epidemiologist
Metropolitan Public Health Department of Nashville and Davidson County

Dr. Helen Morrow
Acting Health Officer
Memphis-Shelby County Health Department

Deborah Neill, Director
Child Care and Adult and Community Programs
Tennessee Department of Human Services

Dr. Martin E. Olsen, Chairman
Tennessee's American College of Obstetricians and Gynecologists
OB-GYN at East Tennessee State University

Linda O'Neal, Director
Tennessee Commission on Children and Youth

Dr. Esra Ozdenerol-Garner, Assistant Professor
Department of Earth Sciences
University of Memphis

Dr. Diane Pace
Tennessee Nurses Association

Donna Parker
Division of Special Education
Tennessee Department of Education

Dr. Theodora Pinnock, Director
Maternal and Child Health
Tennessee Department of Health

Dr. Gwendolyn Robinson,
Case manager/Care Coordinator Healthy Start Initiative
Memphis-Shelby County Health Department

Ellen Shanahan,
The Cecil G. Sheps Center for Health Services Research
The University of North Carolina at Chapel Hill

Leilani Spence
Manager-Community Health Services
Memphis-Shelby County Health Department

Paula Taylor, Director
Policy, Planning & Assessment
Tennessee Department of Health

Anne F. Turner
Director of Licensing
Child Care and Adult and Community Programs
Tennessee Department of Human Services

Dr. Andrea Willis, Deputy Commissioner
Tennessee Department of Health

Dr. Kimberlee Wyche-Etheridge, Director
Family, Youth and Infant Health
Metropolitan Public Health Department of Nashville and Davidson County

Dr. Bryan Williams, Associate Professor
Department of Preventive Medicine
University of Tennessee Health Science
Center, Memphis

Dr. Elizabeth A. Williams, Director
Disparity Elimination
Tennessee Department of Health

Betsy Wood, Senior Vice President
Government Affairs
Tennessee Hospital Association

Kathy Wood-Dobbins, Director
Tennessee Primary Care Association

Gary Zelizer, Director of Government Affairs
Tennessee Medical Association

## APPENDIX VIII: RESPONSE LETTER FROM COMMISSIONER OF HEALTH

*OREA Note: Comptroller's staff met with Commissioner Robinson and key Department of Health staff to discuss this response. OREA made necessary technical changes as requested. However, we remain concerned about long-range planning efforts within the Department to address poor birth outcomes in Tennessee. The report describes many of the services for pregnant women and mothers that affect the health of the newborn (see "Background" of this report), but recommends more aggressive planning and prevention efforts at the state level. The report acknowledges that poor birth outcomes are not only health issues, but are also influenced by socioeconomic factors. We disagree, however, with the Commissioner's statement that it is counterproductive to look toward the Department of Health to carry the burden of the "birth outcome challenge." On the contrary, the Department of Health and its many dedicated staff seem to be in the best position to lead a coordinated state effort, working with other departments and organizations. Lastly, we applaud the recent efforts of the Commissioner and the Department to address the issue of infant mortality more publicly. The "Better Health: It's About Time" initiative may successfully raise public awareness in Tennessee about infant mortality and the importance of prenatal care. Yet we would urge another, more operational component that puts in place actual results-based programs and goals addressing infant mortality, low birth weight, preterm births and access to prenatal care.*

STATE OF TENNESSEE
**DEPARTMENT OF HEALTH**
CORDELL HULL BLDG.
425 5TH AVENUE NORTH
NASHVILLE TENNESSEE 37247

**PHIL BREDESEN**
GOVERNOR

**KENNETH S. ROBINSON, M.D.**
COMMISSIONER

February 17, 2006

Ms. Ethel Detch, Director
Office of Research
Comptroller of the Treasury
505 Deaderick Street, Suite 1700
Nashville, Tennessee 37243-0268

Dear Ms. Detch:

Indeed, there is no comfort in the company of other Southern states' poor birth outcomes. Moreover, as this report highlights, Tennessee ranks consistently among the handful of states with the highest rates of infant mortality in the nation. From a practical perspective, I have found recent attention in the lay press - and ultimately this ambitious report, itself – to be actually helpful to those in Public Health who have been, for decades, both sounding and responding to the alarm regarding poor birth outcomes.

In response to this ambitious and comprehensive report, I would note that the Tennessee Department of Health has historically considered the reduction of infant mortality and improving birth outcomes as priorities. Our State government's Healthy Children Initiative, dating back to the 1980's, expanded pregnancy testing and prenatal care throughout many local health departments, and subsequent federal legislation which allowed presumptive eligibility for Medicaid for pregnant women facilitated both the enrollment of women by health department staff into Medicaid, and also those women's entry into early, adequate prenatal care. TennCare eligibility for pregnant women was notably unchanged by recent TennCare reductions; critically preserved by Governor Bredesen. Tennessee is now even far ahead of the curve in having in the Department one of the most aggressive and comprehensive newborn screening programs of any state, with our peer State Public Health Agencies pointing to Tennessee's leadership in the expansion of newborn screening. *"Mothers and Babies"* have clearly been a priority of this Department.

Upon review of this balanced report, however, one would surely find it counterproductive to look toward a single sector – the public sector, or to a single entity or agency in the public sector, such as this Department - to carry the bulk or burden of the birth outcome challenge facing Tennessee. For example, with the infant mortality rates higher, the percentage of deliveries with adequate prenatal care lower, and the rates of low birth weight babies higher in TennCare births, it is intuitively evident that our TennCare population's birth outcomes must also be a major priority of the Managed Care Organizations.

In reality, as the report itself notes, the solution to this generational epiphenomenon will reside in a multifaceted, multisectoral, longitudinal, sustained approach in the State. Furthermore, while infant mortality is known to be correlated with low socioeconomic status, poor maternal pre-conception health, poor access to healthcare, inadequate prenatal care, maternal age, and the factors associated with SIDS – clearly *un*known is a huge component of the variability leading to the disproportionate rates of infant mortality in racial and ethnic populations. Recent theories regarding the impact of factors such as chronic stress, racism, disparity in healthcare, and history of maternal abuse are now being studied - far beyond the scope of the discipline of public health alone, and beyond the reach of this Department's scope of influence, responsibility and accountability. For Tennessee, with our particularly dismal infant mortality rates among racial minorities, such inquiry becomes especially germane to whether our state can achieve sustained statistical improvements in birth outcomes. The role of the Tennessee Department of Health is to remain abreast of evidence-based best practices, and to implement public health initiatives and programming consistent with those practices.

This has clearly been the approach and a priority of this Administration. Departmental programs and services well documented in the report indeed suggest such a priority status - with an emphasis on the provision of direct healthcare services to women, infants and children - to the extent that the report ultimately questions such a significant level of investment of Maternal and Child Health funding into this tier of services.

The Commissioner further focused the Department on reducing infant mortality, reducing adolescent pregnancy, and encouraging early/adequate prenatal care by launching the ***Better Health: It's About Time*** initiative. With Commissioner's Office-level coordination, its goals are to raise public awareness about the importance of a healthy lifestyle – critical to maternal pre-conception health, to encourage individuals to take personal responsibility for their health and well-being, and to give newborn babies a **better start in life**. This is a core, department-wide, inter-bureau/office initiative - a priority, driven by Tennessee-specific data which highlighted the dramatic racial, ethnic and geographic disparities also reported in this study.

Initial emphasis has been placed on redirecting existing resources, building efficiencies and expanding best practice models. Federal Community Prevention Initiative funds are now supporting model programs aimed at reducing adolescent pregnancy and substance abuse – in the populations and regions where disparities exist. Through multiple methodologies, with multiple funding streams, and at multiple levels and regions, all adolescent health programs and services now converge on providing "no wrong door" services, geared to improving general health and reducing risk factors for adolescent pregnancy. Home-visiting programs - with a significant expansion of HUGS - now reach 93 counties. The Department's unique access to new mothers and their babies through the WIC Program has facilitated a new statewide smoking cessation program for WIC mothers, and the assignment of peer counselors for those who are breastfeeding. To be supportive of TennCare and the MCO's, the Department of Health's TENNderCare Outreach contract with TennCare is being amended to include "infant mortality messaging" for lay workers visiting TennCare families. These laypersons are peer counselors who will also now personally advocate for those maternal and child health practices and behaviors which will improve the birth outcomes in this cohort of

Tennessee's mothers. A major investment has been made in Shelby County to launch an awareness campaign, and to facilitate critical community-based collaborations toward saving the lives of newborns in Shelby County, which has the highest infant mortality rates in the state – and in the nation.

While interstate comparisons are a readily available metric for an external assessment of Tennessee's approach to *"The Health of Tennessee's Future,"* and recommendations could logically follow from those comparisons, clear caveats must also apply. State funding mechanisms – specifically the "supplementation" of funding for women's and infant health services from other sources – vary greatly. Since there is no requisite uniformity, and in fact there is known latitude in how states categorize, allocate and expend resources, particularly Title V Block Grant, such comparisons may not paint an accurate picture of what Tennessee invests toward improving birth outcomes. Of note, this Department has historically been creative in maximizing federal funding sources, and in identifying and tapping into other relevant sources, such as TennCare – which, for example, contracts for the Perinatal Regionalization System, and would not be accounted for in Title V expenditures - TennCare MCO payments, current services revenue, and other state and local appropriations. The nuances and the magnitude of these resources directed toward MCH-related services may not have been totally considered in this report.

While certainly important and underscored in the report, *Tennessee-specific* "infrastructure-building" assessments, evaluation, studies and research alone will not *alone* turn the tide of infant mortality in the state. To some extent, considering current state fiscal stringencies, and the ready availability of well-established best practices, evidence-based policy development, systems of care, standards development and applicable research from other states' similar populations, such infrastructure development could arguably assume a lower priority in deference to direct prevention efforts and interventions. Given the urgency and acuity of Tennessee's birth outcome statistics, and looking toward the goals of the nation's Healthy People 2010 agenda, it is essential to continue to move ahead in the short-term with nationally recognized service models, while additional long-term data and systems planning functions are being developed. Although referenced, but perhaps not as apparent to the researchers, is the seamless accessibility to the MCH Division of data relevant to Title V, currently gathered in the Department's Office of Policy, Planning and Assessment. Such access should mitigate against any decrease in efficiency or duplication of state information systems for the purpose of data collection. Indeed, MCH has already begun collaborating with the Office of Rural Health, in weaving TDH data-driven evidence of geographic and racial disparities into criteria for prioritizing new health resources and health services. We would certainly agree that a continual assessment of the availability of relevant data – and the development of *new* datasets, such as that recommended for the Perinatal Regionalization System – will be key to optimizing the efficacy of efforts to improve birth outcomes.

In the absence of our state's own PRAMS and multiregional PPOR analyses, the Commissioner has encouraged the Department to do as the report otherwise recommends – to apply the best practices, the prevention strategies, the maternal-infant policies and services deemed from such tools in other states. While state-specific data would be ideal,

demographic and socioeconomic similarities with peer states would suggest the applicability of their "lessons learned" to Tennessee. The report suggests a lack of grant-writing expertise; somewhat inexplicable in a Bureau of Health Services Administration which alone currently houses over 40 external grants. This unexpected finding is perhaps reflective of an incomplete understanding of the competitive, historical, and political intricacies of federal grant procurement specifically, or even of the unique challenges of partnering public health with private foundations and corporate philanthropy. We would agree that due diligence in pursuing any and all relevant funding opportunities directed toward this priority would be paramount for the Department, as we move forward.

Considering the report's recommendation for the creation of an Obstetrical Care Task Force, the Department would welcome input from all interested, involved, and influential parties, in providing support, resources, and advice to the executive administration of the state's focus on improving birth outcomes. However, the researchers correctly point out in quoting Marsden Wagner of the World Health Organization, that *"the first priority is not more obstetricians... nor even more prenatal clinics... but rather to provide more social, financial and educational support to families with pregnant women and infants."* The Maternal and Child Health Bureau Vision statement, itself, articulates the need for *"attention to the comprehensive physical, psychological, and social needs of the MCH population."* I would suggest that a broader, interdepartmental, multidisciplinary, public-private approach would be more critically relevant, if Tennessee is to turn the tide of poor birth outcomes.

Finally, I must note that unfortunately perhaps some of the relatively narrowly focused interrogatories posed by the researchers may have tended to generate relatively narrow responses from this Department; rather than fostering the kind of open dialogue and more revealing view of the comprehensive, broad-reaching and proactive approaches taken by the Department of Health during the current Administration, to offset Tennessee's poor long-standing history of birth outcomes. With the extraordinary complexity of the matter, and of this department, it is understandable that the researchers may have been unable to grasp - and the Department unable to effectively convey - how all the pieces fit together; how all the public and private components, all of the multiple funding mechanisms, all of the points of contact, programs and services provided to women and infants, all of the expansive public health and healthcare infrastructure influenced, managed or regulated by the Department, and all of the critical multisectoral, interdisciplinary roles fit together. Yet, in order to plan a clear path toward *"The Health of Tennessee's Future,"* a much clearer map of our state's assets may need to be drawn.

We would invite the opportunity, in another context, to more expansively articulate the leadership provided by our Governor and this Administration, in reducing infant mortality and improving birth outcomes. Surely, much work remains to be done.

Sincerely,

Kenneth S. Robinson, M.D.
Commissioner

## APPENDIX IX: ADDENDUM TO LETTER FROM COMMISSIONER OF HEALTH

*OREA Note: The Department of Health requested that this listing of programs addressing the reduction of infant mortality be included as an addendum to Commissioner Robinson's response letter. The report discusses many of these programs and/or related components. However, others were not included because the programs do not appear to directly affect birth outcomes; the programs were in development; or the programs are outside the scope of this report. "Mothers and Babies: The Health of Tennessee's Future" focuses on efforts to improve maternal and newborn health, while some of the programs below address early childhood health.*

**Tennessee Department of Health Programs Addressing the Reduction of Infant Mortality**

The Tennessee Department of Health has historically considered the reduction of infant mortality and improving birth outcomes as priorities. The role of the Department is to remain abreast of evidence-based best practices, and to implement public health initiatives and programming consistent with those practices. Infant mortality is one of the top national Maternal and Child Health priorities. Six of the eighteen national performance measures for the national Maternal and Child Health (MCH) Bureau focus on factors relevant to infant mortality, such as breastfeeding rates, the birth of low and very low birthweight babies, teen pregnancy rates, newborn screening rates and the rate of women who receive prenatal care in the first trimester. Tennessee has embraced all of the national performance measures and has further expanded its focus on infant mortality by designating four of its ten state performance measures on related factors. They are: increasing Chlamydia screenings; decreasing maternal drug, smoking and alcohol use; decreasing premature births; and increasing the rate of annual well health visits among adolescents.

There are many different funding sources used to address infant mortality reduction activities and related programs including, but not limited to: Title V, Title X, WIC, Alcohol and Drug Preventive Block Grant, TennCare interdepartmental revenues, and state appropriations. The following is a list of select programs that either directly or indirectly focus on reducing infant mortality or factors contributing to infant mortality. The list is not all inclusive and does not highlight the Department's population-based programs that address the general health of all Tennesseans. Additional information about these and other Department of Health programs can be found at www.tn.gov/health/.

- **Prenatal Care:** Local health department clinics offer two levels of prenatal care:

  (1) All local health department clinics offer basic prenatal care, which includes pregnancy testing, eligibility determination for TennCare, WIC, counseling, information, and referral for medical care. Local health departments provide direct on-line application for pregnant patients who are presumed eligible for TennCare (presumptive eligibility).

  (2) 10 counties provide comprehensive prenatal care with delivery by a private physician. Many of these counties are serving primarily Hispanic clients, most of whom do not have insurance or do not qualify for TennCare. According to PTBMIS data system information, 2,820 pregnant women were provided comprehensive care during CY 2005. Of this total, 81% were self pay (not on TennCare) and 68% were Hispanic. The counties which currently are providing prenatal care include: Bedford, Dickson, Hamilton, Macon, Madison, Montgomery, Putnam, Rutherford, Sumner, and Wilson.

- **Folic Acid:** Distribution of vitamins with folic acid and folic acid education. All reproductive age women need to take at least 400 mcg of folic acid daily for the prevention of neural tube defects (NTDs). Approximately 50% of all pregnancies are unintended. NTDs occur in 1.4-2

per 1,000 pregnancies and are the second most common major congenital anomaly worldwide. Because the neural tube is nearly formed by the time of the first missed period, folic acid must be ingested before conception and at least through the first 4 weeks of fetal development to be effective. Joint activities in Women's Health and Nutrition Sections include: exhibits, educational materials, presentations for the public and professionals, information on the web, media, continuing education modules for dietitians and pharmacists, and distribution of multivitamins to non-pregnant women seen in local health department clinics.

- **WIC:** The Special Supplemental Nutrition Program for Women, Infants and Children (WIC) provides nutrition education and supplemental foods for pregnant and breastfeeding women, infants, and children to age 5. The WIC Program also provides early entry into the health care system, encourages childhood immunization and provides referrals to social services. Participants learn how to use healthful foods to promote growth and development and improve long-term health.

  The Tennessee WIC Program provides supplemental food items to approximately 154,500 eligible participants each month in 155 locations throughout the state. The Tennessee WIC program serves on a monthly basis approximately 20,088 pregnant women, 14,632 postpartum women, 6,429 breastfeeding women and 43,759 infants under the age of 1 year.

  In the WIC Program, Nutritionists are available to teach individuals or groups proper nutrition for their stage of life – prenatal, post partum, breastfeeding, infants and children. Education includes healthy eating and cooking, food budgeting, and more specific education on important nutrients such as folic acid and its role in the prevention of birth defects and positive pregnancy outcomes. Registered dietitians counsel participants with special dietary needs such as pregnancy induced hypertension, gestational diabetes and weight management – all which play a significant role in the reduction of low birth weight and preterm deliveries. Breastfeeding classes and support are also available to all new mothers. Breastfeeding is important in the protection of SIDS, or sudden infant death syndrome.

  WIC serves as a referral source for a variety of community services, specific to the community served. WIC providers refer patients for a variety of health reasons and more importantly, discuss with the participant why the health service is needed. A specific community resource list is provided to each participant at certification. Hotline numbers are provided to participants for the WIC hotline and the Baby Line. Referrals and resources include prenatal care, well child exams, immunizations, TennCare, smoking cessation programs, drug/alcohol rehabilitation centers, and basic living resources such as food banks, housing and transportation.

- **SMART MOMS:** S.M.A.R.T. Moms is a smoking cessation program specifically targeting pregnant women. It is administered through WIC clinics with support from Women's Health. Data from the past three years of implementation, under a March of Dimes grant, show that statewide 24.4% of clients who received the cessation guide quit smoking versus 21.4% of those that said they would attempt to quit smoking but did not use the S.M.A.R.T. Moms guide. Both numbers exceed the 14% success rates found in similar settings. Available data for the three year grant period show that 8,593 WIC clients received counseling through S.M.A.R.T Moms. The program has now transitioned from the March of Dimes funding to become a Tennessee Department of Health WIC clinic activity.

- **Breastfeeding:** Breastfeeding is widely promoted through the WIC program and other local health department staff providing services to pregnant women. Each of the 23 nutrition centers has a room exclusively for breastfeeding mothers to use. All rural and metropolitan regions have a breastfeeding coordinator who prepares an annual plan for promotion and

support activities. Each clinic has a staff person responsible for coordinating breastfeeding services. Breastfeeding counseling is a required nutrition education component of the WIC Program. Other activities include staff training on breastfeeding promotion and support; Incredible Baby Showers; coordination with the 5 breastfeeding coalitions across the state; and community activities for World Breastfeeding Week.

- **Breastfeeding Peer Counselors:** Effective October 2005, 35 WIC breastfeeding peer counselors were working across the state.

- **Perinatal Regionalization:** The five Regional Perinatal Centers provide perinatal care for high risk pregnant women and newborns if no other appropriate facility is available to manage significant high risk conditions. Funding from the state (TennCare) is used to provide consultation and referral for facilities and for health care providers within the respective perinatal region, professional education for staff of hospitals and for other health care providers within the region, and maternal-fetal and neonatal transport. An advisory committee of 21 persons is composed of the obstetrical and neonatal directors of the regional centers, representatives from the medical schools, public health, hospital administrators, family physicians, medical specialists in obstetrical and newborn conditions, obstetrical and neonatal intensive care nurses, and the general public.

- **Newborn Screening/Genetics:** All newborns are screened in accordance with the screening panel established by the Department (with assistance of and advice from the Genetics Advisory Committee. During 2004, the State Laboratory installed tandem mass spectrometry equipment to increase screening capabilities. Testing for maple syrup urine disease, MCAD deficiency and homocystinuria began January 2004. The State Laboratory was then screening infants for the nine diseases recommended by the March of Dimes (PKU, galactosemia, congenital hypothyroidism, congenital adrenal hyperplasia, biotinidase enzyme deficiency, hemoglobinopathies, maple syrup urine disease, medium-chain acyl coA dehydrogenase (MCAD) deficiency, and homocystinuria). In April and July 2004 testing expanded again to include additional metabolites which in different combinations relate to amino acids, organic acids or fatty acid disorders. Currently, the program is screening for 40 types of genetic disease (66 different diseases, i.e., subtypes).

  Tests are sent from hospitals and other birthing facilities to the State laboratory. Women's Health/Genetics staff are responsible for interfacing with the State Laboratory to identify, locate and follow up on newborns that have unsatisfactory or abnormal results from the mandated newborn screening test. Staff provide immediate follow up on infants who have presumptive positive results. Health department staff are asked to assist anytime an infant cannot be located. Referrals are made to the genetics and sickle cell centers across the state. Access to genetic screening, diagnostic testing and counseling services is available at three comprehensive and two satellite Genetic Centers and two comprehensive and two satellite Sickle Cell Centers for individuals and families who have or who are at risk for genetic disorders.

- **Family Planning:** The statewide Program provides comprehensive family planning services, including medical examinations, laboratory tests, education and counseling, and contraceptive supplies. These services include Pap smears, screening and treatment for sexually transmitted diseases, breast exams, and screening for anemia. In calendar year 2005, services were provided to 114,969 clients at 130 clinic sites in all 95 counties of the state through local and metropolitan health departments and private non-profit agencies. Data for 2005 show that 64.1% of the caseload was below the federal poverty level, and 81.2% were 150% and below. Although all persons are eligible for services, the program has always marketed services to the uninsured and underinsured.

  Unintended pregnancy is a major problem that cuts across racial, ethnic, socioeconomic and demographic lines. Every year, half of all pregnancies in Tennessee and in the United

States are unintended. By helping women to time and space their births, contraceptive use helps avoid the adverse health, social and economic consequences associated with unintended pregnancies. Using contraceptives is effective in reducing rates of unintended pregnancy.

Providing family planning services statewide to reproductive age persons provides the opportunity for risk assessment and counseling on preconceptional health (smoking, substance use, nutrition, exercise, etc.) and the means for clients to plan for their pregnancies.

- **TAPPP (Tennessee Adolescent Pregnancy Prevention Program):** The state level office was established in 1988, and is within the Women's Health/Genetics Section of the Department of Health. TAPPP has three main goals:

  (1) To promote community awareness and involvement in adolescent pregnancy and parenting issues.
  (2) To facilitate collaboration among various sectors of the community to enhance and increase prevention efforts.
  (3) To coordinate, improve and expand services available to pregnant and parenting adolescents.

  County health educators, working with county and regional health councils, plan and implement teen pregnancy prevention activities in their communities. Each council participates in a wide range of activities, depending on local priorities and resources.

  Examples of TAPPP activities are: providing networking opportunities such as workshops and conferences for adult professionals and parents; community education and awareness activities for students, parents, and providers through classes in schools, and community agencies; displays set up at clinics, malls, libraries, and health fairs; media presentations; and loans of audio-visual and print materials.

- **Abstinence Program:** Federal funds were used in FY 2005 to fund 18 community based projects in 18 counties. An annual statewide conference for parents, youth development workers, and state employees has been conducted since 1999. Technical assistance is also provided to funded projects, SPRANS and other agencies needing guidance with abstinence training. SPRANS funded agencies receive funds directly from the federal government for abstinence education. Education brochures are housed in Central Office and are distributed across the state free of charge to nonprofit agencies upon request.

- **Adolescent Health:** Besides establishing an advisory committee comprised of public and private agencies which focus on adolescents, adolescent health regional representatives were recruited and meet to plan regional adolescent health trainings. Most regions have conducted this training which focused on how to provide "youth friendly" services, addressed obesity issues among adolescents and invited a local youth panel to the clinic to discuss their health perspectives. An adolescent health data report which focuses on several teen health issues including teen pregnancy is in the final stages of production and will be distributed to policymakers, adolescent health program staff as well as other adolescent health stakeholders.

- **Community Prevention Initiative (CPI**): A request for grant proposals (RFGP) was released in fall 2005 for community projects that provides for model programs for children and adolescents ages 8 to 16. These programs contain the components of successful substance abuse prevention and adolescent pregnancy prevention programs. The funding has been allocated geographically based on the risks of substance abuse and adolescent pregnancy.

- **Chlamydia Screening:** Chlamydia is one of the most common, treatable, sexually transmitted infections affecting women of reproductive age in the United States today. Chlamydia causes complications related to fertility and pregnancy, including increased rates of premature delivery, premature rupture of membranes and low birth weight. Tennessee, through the Department's family planning and sexually transmitted disease clinics, is providing screening and treatment statewide. Approximately 100,000 tests are conducted annually.

- **HIV Counseling and Testing Services:** All health department clinics offer HIV counseling and testing services. All clinics also offer pregnancy testing and counseling; HIV testing is available to all clients testing positive for pregnancy. In those counties providing comprehensive prenatal care, HIV counseling and testing is offered as a standard of care. Clients receiving family planning services at all sites statewide are assessed for HIV/AIDS risk behaviors, counseled regarding risk reduction behaviors, and offered testing.

- **HUGS (Help Us Grow Successfully):** The HUGS program provides home-based prevention and intervention services to children, birth through 5 years, that may have health risks and/or risks of developmental delays or have identified delays. Prenatal/postpartum women are provided services to prevent or reduce complications, subsequent unplanned pregnancies, and developmental delays in the unborn child. Services assist this population in gaining access to health care, psychosocial, educational, and other necessary services to promote good health practices, improve general well being, prevent developmental delays, and reduce maternal and/or infant mortality and morbidity. The program is based on a care-coordination model. Since 2003, HUGS has broadened its guidelines to cover women who have lost children in the first year of life and expanded services into 50% more counties.

- **Healthy Start Program:** The Healthy Start Program provides intensive home visiting services in 26 Tennessee counties. The program provides education and support services prenatally through the child's fifth birth date. The program ensures that all mothers receive prenatal care and have a medical home. The intensive contact helps ensure that mothers attend appointments and follow through with any doctor's recommendations. The long term nature of the program ensures ongoing support and education for the child and family. The frequent presence in the home provides opportunities for the home visitors to detect medical problems that might have been missed by the new parents.

- **Child Health and Development (CHAD):** The Child Health and Development Program (CHAD) provides home visiting services in 23 Tennessee counties. The services are consistent with the HUGS program with the exception of prenatal service to adults. DCS funding for this program only allows prenatal service to mothers less than 18 years of age.

- **Families First:** The Department of Health through Maternal and Child Health and the local health department clinics are partners with the Department of Human Services in Families First, Tennessee's welfare reform program. Department of Health staff make home visits to families who come off of the program before successful completion to help determine if the health and/or safety of the children is in jeopardy and to provide any appropriate referrals for assistance. The Department of Health is also working with the Department of Human Services to ensure that all Families First children are immunized by the age of two and receive regular well child exams.

- **Child Care Resource Centers:** Tennessee's Child Care Resource Centers are available across Tennessee to help child care providers improve the quality of child care. These Centers are the result of a collaborative project involving the Tennessee Department of Human Services, the Tennessee Department of Health, and the Tennessee Developmental Disabilities Council. There are eleven child care resource centers across the state serving

providers in all of the state's 95 counties. The areas emphasized by the resource centers are: developmentally appropriate practice, health and safety, and the inclusion of children with special needs. Services include: training, technical assistance and consultation, and a lending resource library.

Since 2003, DOH has increased its contract by 50% to provide intensive training to daycare providers in the three regions with the worst health and safety ratings. Trainings offering safe sleeping practices and stronger parent education are provided.

- **SIDS (Sudden Infant Death Syndrome):** The Child Fatality Review Teams and SIDS Coordinators developed a Plan of Action to increase parent education on children's sleeping arrangements and the relationship to SIDS. Interventions include risk reduction by promoting babies sleeping in the supine position; limiting exposure to cigarette smoke, both during pregnancy and after; improving safety of sleep environments; increasing SIDS awareness with appropriate sleep positions in high school classes; providing packets of information to health department clients, distributing videos on infant sleep positioning to local health departments and private physician's offices; providing PSA's for local Public Access channels, providing videos to home visiting staff for use in the home and encouraging home visitors to assess the sleeping arrangements of each child in the program and measure the number who put their infants under 8 months on their back to sleep as well as measuring the number who are educated on "back to sleep" as one of the outcome objectives for the program.

  Since 2003, the SIDS program has developed a training video and curriculum entitled "Prevention Through Understanding." This training is being provided to the more than 30,000 first responders from law enforcement, emergency medical services and the fire department. Almost one fourth of the first responders have received the training.

  The Department, in collaboration with the University of Tennessee Health Sciences Center and other Shelby County entities is launching a public awareness campaign on SIDS prevention and safe sleep practices. This project will include increased education to faith based organizations, community groups, health care providers and daycare providers in zip codes with worst infant mortality rates. In addition, information on safe sleep practices will be given to over 10,000 mothers of newly born infants. The regional health council in the area will assist in implementing the project. The project will include an assessment of pre and post campaign knowledge and behavior.

- **Child Fatality Review:** The Child Fatality Review process is a statewide network of multi-discipline, multi-agency teams in the 31 judicial districts in Tennessee to review all deaths of children 17 years of age or younger. Each local team makes reviews death records and makes recommendations to program staff and the statewide team. At the end of each year the state team compiles the recommendations for prevention into an annual report and it is then distributed across the state. Program staff then disseminates the recommendations to agencies that are willing to help institute prevention activities. Recommendations from the teams include increasing education/awareness regarding the dangers of smoking during pregnancy; increasing education on the importance of strong families, coordinate with the March of Dimes to increase targeted education to reduce premature births and deaths in all socio-economic groups; and to increase education of the signs and symptoms of shaken baby syndrome in children who present routinely with problems to the offices of medical providers, DCS, etc.

- **Early Childhood Comprehensive Systems (ECCS**): ECCS establishes partnerships and collaborations which support families and communities in their development of children that are healthy and ready to learn at school entry. This goal is achieved by addressing the following service components 1) access to health insurance and medical homes; 2) mental health and social-emotional development; 3) early care and education/child care; 4)

parenting education; and 5) family support. Public and private agencies coordinate their efforts to assure availability of a broad range of non-duplicated services regarding these initiatives.

- **Children's Special Services (CSS):** CSS is the Tennessee Department of Health MCH Title V program that serves children with special care needs. The mission of CSS is to provide services that promote the well-being of children in a manner that is family centered, culturally sensitive and community based through service coordinators. An individualized Family Service Plan is developed with the parent(s) which is a family assessment tool that serves as a guide for the coordination of care. This assessment includes family concerns/needs in addition to the care of the child. The care coordinators are either Registered Nurses or Social Workers and appropriate education and referrals are made based on the findings of the assessment and the plan developed with the parents/client. This plan can include prenatal care/concerns, adolescent pregnancy prevention of the child/parent/sibling; and infant mortality prevention through safety education and the use of child safety seats. Additionally, the plan is reviewed by the CSS Regional/Metro Coordinator and after reviewing this and the medical records, a referral for a Genetics evaluation is made if indicated.

- **TENNderCare/EPSDT**: Screenings are being provided in all rural and metropolitan health departments, in CY 2005, 64,682 screenings were done. Letters are sent to primary care providers to notify them that a screening has been done and to alert them of any finding requiring follow-up care.

  The Department has implemented a community outreach project to increase awareness of the availability and importance of EPSDT services. The statewide project uses public health educators and lay outreach workers to provide outreach and education services to families with TennCare children, TennCare teens and young adults, TennCare providers, and community leaders. The contract with TennCare is currently being amended to include "infant mortality messaging" for lay workers visiting TennCare families. They are peer counselors who will also now personally advocate for those maternal and child health practices and behaviors which will improve the birth outcomes in this cohort of Tennessee's mothers.

  Additionally, the Department operates an EPSDT outreach call center. Outreach operators phone TennCare families who have children eligible for EPSDT screening services, providing education and offering appointment scheduling assistance. In June, additional staff will be added to the call center including a nurse practitioner and two registered nurses who will make calls to pregnant TennCare enrollees as well as families with infants less than a year of age

- **One for All:** "One for All" is an infant mortality public awareness campaign that will be launched in April, 2006.

**Programs At a Glance**

| Program/Activity | Adolescent Pregnancy | Prenatal Care | Infant Mortality |
|---|---|---|---|
| Prenatal Care | | X | X |
| Folic Acid Education/Vitamins | | X | X |
| S.M.A.R.T. Moms | X | X | X |
| Chlamydia Screening | X | X | X |
| HIV Counseling/Testing | X | X | X |
| Adolescent Health | X | | O |
| Abstinence | X | | O |
| Family Planning | X | | X |
| Tennessee Adolescent Pregnancy Prevention Program (TAPPP) | X | | O |
| Pregnancy Testing | X | X | X |
| WIC/Nutrition | | X | X |
| Presumptive Eligibility/TennCare | | X | X |
| Perinatal Regionalization | | X | X |
| Genetics Centers | | X | X |
| Breastfeeding Promotion | | | X |
| Home Visiting HUGS/CHAD | X | X | X |
| Healthy Start Projects | O | X | X |
| Community Prevention Initiative | X | | O |
| Newborn Screening | | | X |
| Child Care Resource and Referral Center | | | X |
| EPSDT | | | X |
| Child Fatality Review System | | | X |
| SIDS Prevention | | | X |
| Lead Poisoning Prevention | | | X |
| Early Childhood Comprehensive Systems | | | X |
| Children's Special Services | X | | O |
| | | | |
| Statewide Media Campaign Infant Mortality | X | X | X |

X= direct impact O = indirect impact

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