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Center for Urban Child Policy

THE THREE TENNESSEES: CHILD AND INFANT HEALTH IN THE THREE GRAND DIVISIONS OF TENNESSEE

This policy brief assesses regional disparities in infant and child health in the three Grand Divisions of Tennessee and discusses the implications of these findings for health outcomes and for public policy approaches for improving health.

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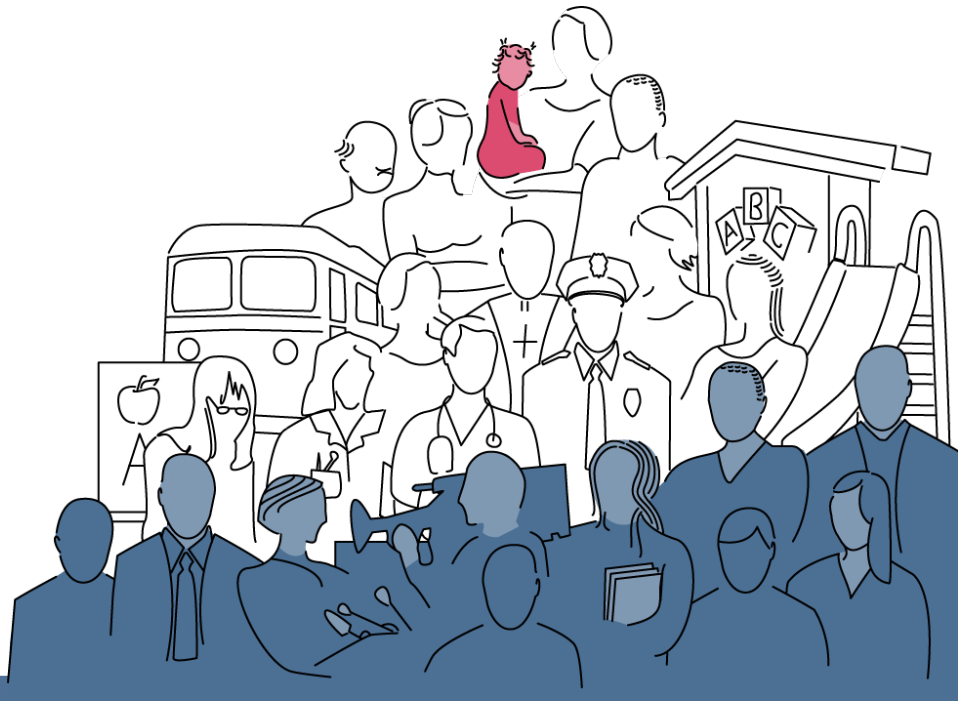
July 31, 2009



EXECUTIVE SUMMARY

Tennessee has, for many years, ranked among the states with the worst health outcomes. The state includes three Grand Divisions with different demographic, socioeconomic, and geographic features. These differences – in turn – may account for noticeable differences in health outcomes for their populations. The aggregate health ranking of Tennessee does not adequately reflect the health of residents of the individual regions, and these regional differences have significant implications for statewide and regional efforts to improve health.

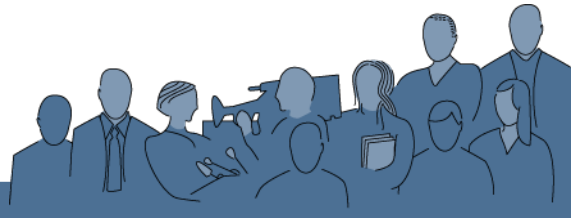
This study documents these regional differences for measures of infant and child health, and demonstrates their implications for state rankings. In general, the strongest child health outcomes in the state are in the Middle Division, and worst outcomes are in West Tennessee. These differences likely result from the broad and complex mix of demographic, socioeconomic, and cultural characteristics among the regions.

Our findings demonstrate the importance of implementing health improvement strategies that are specifically targeted toward the major health issues facing each region and that reflect the underlying differences in the economic, social, and cultural determinants of health. A single plan for the entire state, in contrast, may not respond to these regional differences and may result in ineffective and inefficient attempts to improve health.

Introduction

Improving infant and child health in Shelby County and in Tennessee is a critical but difficult goal. It is critical because of the human suffering that results from sick and dying children and because of the consequences for later life as sick children grow to become unhealthy adults. Unhealthy workers then lose income, and workforce productivity falls. The entire community is affected as an unhealthy population consumes public resources that could be used for other needs, reduces investment in businesses and community infrastructure, and inhibits social growth (Mirvis and Bloom, 2008). These direct health consequences are compounded by the low educational achievement of sick children, further reducing their later well-being and productivity.

Tennessee ranks low compared to other states in most measures of health including child health. The 2007 United Health Foundation's American Health Rankings placed Tennessee 46th in overall health (United Health Foundation, 2008). The Annie E. Casey Foundation 2008 Kids' Count report ranked Tennessee 42nd among the states in measures of child health (Annie E. Casey Foundation, 2008), with rankings among the lowest 10 states in infant mortality, and rates of low birth weight infants, and teen pregnancies.



The series of Data Books published by The Urban Child Institute underscore the scope of the problem in Memphis and Shelby County (The Urban Child Institute, 2009). Shelby County had worse child health statistics than the overall state. For example, the infant mortality rate among African Americans in Shelby County was 3.8 times the national average.

Why Is Regional Analysis Important?

State-wide rankings do not reflect the heterogeneity of the populations in any state. Tennessee extends from the Mississippi River on the west to the Appalachian Mountains on the east. It includes two traditionally impoverished regions that are two of the three least healthy regions of the nation – the Mississippi River Delta and Appalachia. These two divisions and the region between them have very distinctive population, economic, cultural, and environmental characteristics. These differences have been formalized in Tennessee history and thinking as forming the Three Grand Divisions of the state – East, Middle, and West, as shown in Figure 1 (Tennessee Department of State, 2008).

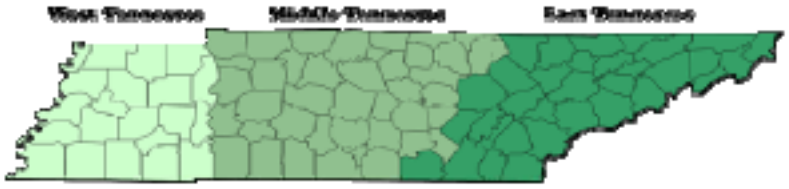
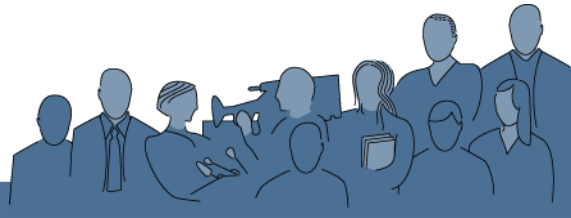


Figure 1: The three Grand Divisions of Tennessee.

These differences among the three regions represent important variations in the determinants of health (Marmot, 2002). Thus, the particular features of the three regions may lead to significant variations in health outcomes. These differences may, on the one hand, be masked in a single, state-wide measure. On the other hand, a low performing region of a state may pull the overall state ranking down suggesting, perhaps inappropriately, that the health of the entire state is poor.

What Was the Purpose of This Study?

It was the goal of this "Three Tennessees" study to quantify the differences in infant and child health measures in the three Grand Divisions, to assess the implications of these differences on the state's overall ranking, and to consider the implications of these differences on state and local strategies to improve health.



This effort was modeled after that of Murray and his associates (2006) in the "Eight Americas" study. That study divided the U.S. population into eight subgroups based on race, income, and rural/urban location. They demonstrated that the eight population subgroups within the United States have very different health outcomes. Each of the "Americas" was ranked against the other member nations of the World Health Organization. The difference in the average life span in the healthiest and the least healthy groups, for example, exceeded the difference between Iceland (with the longest life span) and Bangladesh.

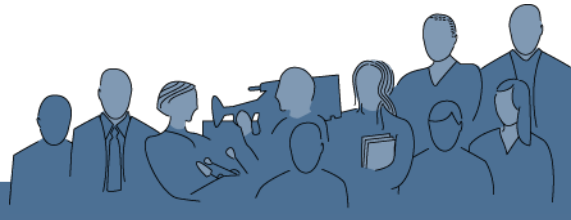
What Did We Study?

Data describing health conditions and outcomes for each county in the nation were obtained from the Area Resource File compiled by the U.S. Department of Health and Human Service (US Department of Health and Human Services, 2007). This dataset includes over 6000 variables, selected from a variety of primary data sources, for each of the U.S. counties.

We selected variables related to infant and child health that were available for every county. These included rates of neonatal (1-27 days), infant (under age 1 year), and child (1-14 year old) mortality; rates of low (under 2500 grams) and very low (under 1500 grams) weight births; rates of preterm (under 37 weeks gestation) births; rates of births to teen mothers, to unmarried mothers, and to mothers who did not graduate high school; and rates of late (only in the third trimester) or no prenatal care. Average rates during the three year period from 2001 through 2003 were used.

Data for each state (50 states plus the District of Columbia) were computed by combining the data for all counties in a state. For Tennessee, the data were also aggregated to the level of each of the three Grand Divisions.

Each state was ranked against all states for each variable. A rank of 1 was assigned to the state with the most desirable outcome (e.g., lowest infant mortality rate, highest rate of early prenatal care, etc.) and a rank of 51 (the 50 states and the District of Columbia) was assigned to the state with the least desirable outcome (e.g., highest infant mortality rate, lowest rate of early prenatal care, etc.). Next, Tennessee was replaced in the ranking scheme by each one of the three Grand Divisions to determine how that region independently ranked among the states. Thus, each Grand Division was assigned a ranking out of 51 geographic entities (49 states, the District of Columbia, and one of the three Grand Divisions) for each health measure.

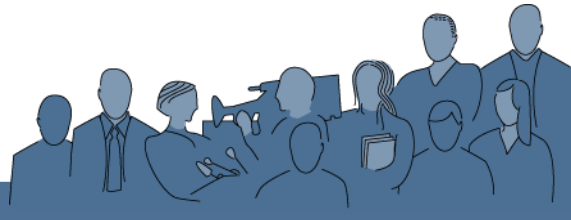


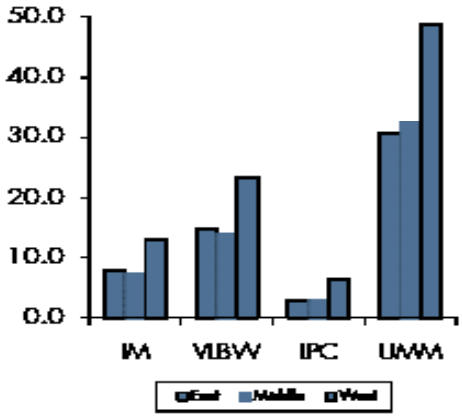
INFANT AND CHILD HEALTH OUTCOMES -- RANKINGS AND STATISTICS*

	Tennessee		West Division		Middle Division		East Division	
	Rank	*Value*	*Rank*	*Value*	*Rank*	*Value*	*Rank*	*Value*
Mortality								
Neonatal (1-27days) Mortality Rate**	46	2.41	51	3.22	39	2.01	44	2.18
Infant (< 1 yr) Mortality Rate**	47	9.14	51	13.12	30	7.32	39	7.88
Child (1-14 yrs) Mortality Rate**	35	0.24	45	0.28	31	0.22	34	0.23
Natality								
Low Birth Weight (<2500 grams) Rate**	45	92.41	49	105.7	37	83.97	45	90.94
Very Low Birth Weight (<1500 grams) Rate**	42	16.9	50	23.38	28	14.02	29	14.75
Preterm (gestation <37 weeks) Rate**	46	139.4	47	150.1	37	128.9	47	142.3
Prenatal Care								
Percent Receiving Early Prenatal Care (1st trimester)	32	81.32	48	74.63	17	84.27	21	83.57
Percent Receiving Late(3rd trimester) or No Prenatal Care	37	3.86	48	6.47	15	2.75	17	2.93
Family Characteristics								
Percent of Births to Teen Mothers	41	4.44	49	5.72	32	3.59	41	4.36
Percent of Births to Unmarried Mothers	40	36.37	50	48.66	20	32.31	15	30.67
Percent of Births to Mothers Not High School Graduates	38	21.26	41	22.64	31	20.13	38	21.41

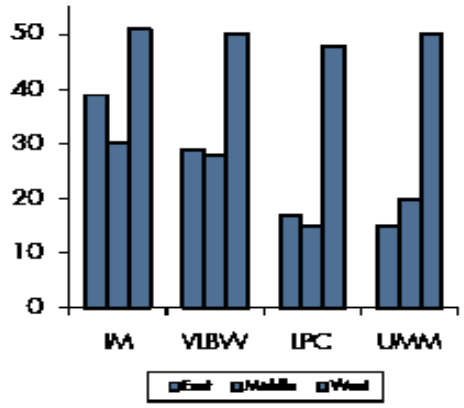
* Rates represent 3 year (2001-2003) averages.
** Per 1000 live births

The results are shown in the Table. The values for each measure for the state as a whole and for each Grand Division are shown, as are the rankings of the state and each Grand Division against all other "states", as described above. Several findings are important.





Rates per thousand of infant mortality (IM), very low birthweight births (VLBW), late prenatal care (LPC), and births to unmarried mothers (UMM) for the three Grand Divisions of Tennessee.



Rankings among the states, as described in the text, of the three Grand Divisions of Tennessee for the selected measures of child health.

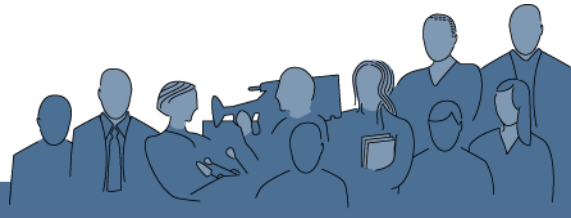
Divisions of Tennessee.

First, separately analyzing regional outcomes and, then, ranking Tennessee and its individual regions against all other states emphasizes the strong variation in child and infant health outcomes within the state.

Outcomes were significantly better in some regions (most often the Middle Division) than the state average and were significantly worse in others (most often the West Division).

This is shown for the selected measures listed in the Table and illustrated in Figure 2. For example, Tennessee ranked 47th out of 51 states in infant death rate (9.14 deaths per 1000 live births). However, the three Grand Divisions varied widely in their rankings. The Middle Division ranked 30th (7.32 infant deaths per 1000 live births) and the East Division ranked 39th (7.88 infant deaths per thousand live births). However, the West Division ranked 51st (13.12 infant deaths per 1000 live births). When the West Division of Tennessee was excluded from the state's statistics (that is, when only data for the Middle and East Grand Divisions were included), Tennessee's overall rank rose from 47th to 33rd.

Similar patterns were observed for rates of preterm, low birth weight, and very low



birth weight births. The regional differences in the rate of infants with very low birth weights were striking. The West Division ranked 50th, with a rate of 23.38 per 1000 births – a rate almost double that of the East Division (14.75 per 1000 births) which ranked 29th and the Middle Division (14.02 per 1000 births) which ranked 28th. Tennessee as a whole ranked 42nd (16.90 per 1000 live births). When results from the West Grand Division were excluded, the state's ranking rose to 28th.

Second, these differences in rates translate into a substantial excess of lost lives.

One way to illustrate the impact of these differences is to estimate the number of lives that would have been saved if all regions had the same rate as did the region with the best outcome. If the infant mortality rate of West and East Tennessee were at the level of the Middle Division, an average of 142 infant lives would be saved each year. Of these, 124 of those would have been in the West Division.

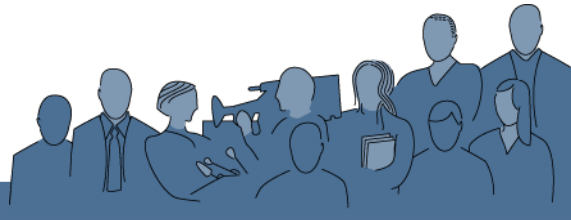
Third, broad differences also exist in conditions generally related to child health outcomes.

The data in the Table also illustrate differences in rankings for maternal factors commonly considered to impact child health outcomes. Differences in rankings between the regions are greatest for prenatal care measures. Tennessee ranked 37th in the percent of mothers who received late (third trimester) or no prenatal care. However, the Middle and East Divisions ranked 15th and 17th, respectively. The West Division ranked 48th, with 6.47% of mothers receiving late or no prenatal care – a rate that was more than twice that of Middle (2.75%) or East (2.93%) regions. When West Tennessee data were excluded from the state data, Tennessee's rank rose from 37th to 16th.

Other maternal characteristics also varied among the regions. The East Division ranked 15th in the rate of births to unmarried mothers, the Middle Division ranked 20th, and West ranked 50th. The state as a whole ranked 40th; when only East and Middle Divisions were included, the state ranked 19th.

Fourth, for many variables, no region of Tennessee performed at levels achieved by other states.

For example, none of the three Grand Divisions had neonatal, infant or child mortality rates, low or very low birth weight birth rates, or preterm birth rates that were among the best 50% of the states. Thus, while some regions were worse than others, none of the regions in the state performed above the national average for many health mea-



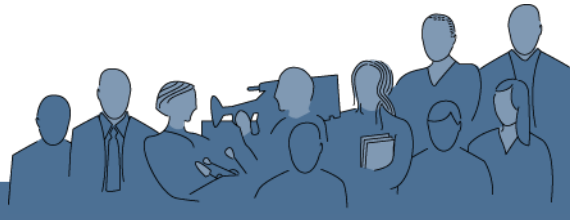
sures.

What Do These Results Mean?

Tennessee has long been viewed as being divided into three Grand Divisions. Our data indicate that these regions differ substantially in various measures of infant and child health and in maternal conditions that are related to these outcomes. In general, child health outcomes are worst in West Tennessee and best in Middle Tennessee. In other words, however bad health outcomes are in Tennessee, they are worse in West Tennessee.

We chose rankings to depict differences between regions for several reasons. First, ranking reports receive considerable public attention, possibly because they provide comparisons that are easier to understand, that is, relations to other states, than are comparisons to statistical benchmarks. As noted by Gerzoff and Williamson (2001), "when it comes to measuring performance, America is in love with ranking. The desire to say who is number one, who is last, and where everyone else falls in between seem irresistible." Rankings also compare each state to levels of health that have already been achieved rather than to levels that are based on conceptual models or that are "hoped for"; thus, others have already demonstrated that better results are possible. Rankings have also been applied to counties within states, including Tennessee (Tennessee Institute of Public Health, 2008), as well as to nations (World Health Organization, 2008).

Rankings are, however, imperfect measures of performance (Gerzoff & Williamson, 2001). Differences or changes in rankings do not necessarily reflect actual levels of performance. Two states may, for example, differ by only a small amount in an outcome but be separated widely in ranking if many states have tightly clustered results. The confidence intervals around the estimates for the variables may be wide so that apparent differences are not statistically significant. In addition, a state may fall in rank from one year to the next even though its actual performance improved if other states showed greater improvement (although this too would be significant for health improvement efforts in the state).



What Are The Implications Of These Findings?

The differences we note have substantial implications for how we should evaluate Tennessee's performance relative to other states. The single overall ranking of the state on any health measure does not accurately reflect variations in health conditions across the regions; instead, state level data masks both poor conditions in some regions and substantially better performance of others.

The causes of these regional differences are complex and likely represent the interaction between many differences in the demographic, socioeconomic, and cultural makeup of the Divisions. This complexity is suggested by the different societal contexts of two regions (e.g., east and west Tennessee) with similar problems (e.g., the rates of preterm births and births to teen mothers).

Our findings have important implications for health care and health planning in Tennessee. Many outcomes are below average for all regions of the state and require statewide interventions. However, the regional differences in health measures emphasize the critical importance of assessing and addressing Tennessee's poor population health on a regional basis.

These findings argue for a set of regional health strategies, rather than a single statewide approach, that target the specific issues facing various sub-regions of the state and that reflect the different underlying social contexts in each area. This targeted public policy approach has led organizations, such as the World Health Organization, to promote "pro-poor policies" that specifically target the needs of the poor (World Health Organization Regional Office for the Eastern Mediterranean, 2004). The poor may be the least able to benefit from broadly based improvement plans because of limited personal and fiscal resources. Hence, programs that target health improvement across the entire state may have the least benefit for those most in need. In addition, the poor often have, as noted by the economist John Kenneth Galbraith, less political clout than do others so that specific attention to their needs by others is warranted (Galbraith, 1993).

A single health plan for the state may, in contrast, fail to reflect and adequately represent the needs of particular regions. It may not reflect regional differences in social and demographic factors that are responsible, in part, for the differences in health outcomes and that must be considered when designing and implementing interventions. Approaches that do not consider these regional differences in both health and in the determinants of health may result in ineffective and inefficient attempts to address these critical issues.

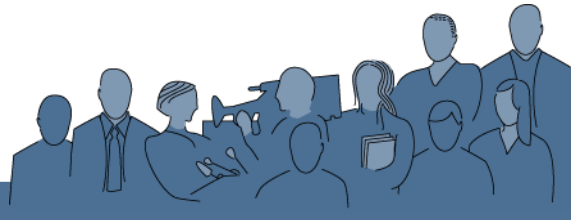


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Figure Legends

Figure 1: The three Grand Divisions of Tennessee.

Figure 2:

Left Panel: Rates of infant mortality (IM), very low birthweight births (VLBW), late prenatal care (LPC), and births to unmarried mothers (UMM) for the three Grand Divisions of Tennessee.

Right Panel: Rankings among the states, as described in the text, of the Three Grand Divisions of Tennessee for the selected measures of child health.

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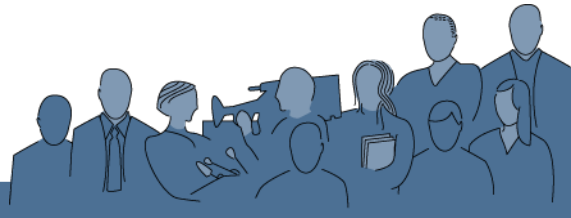

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Complete results of this study will appear in Tennessee Medicine, the publication of the Tennessee Medical Association.

The Urban Child Institute (TUCI) promotes optimal brain development for children from conception to age three. TUCI's Center for Urban Child Policy supports that mission by building our understanding of inputs to - and implications of - early brain development in our community.

For more information on the well-being of children in Memphis and Shelby County, please visit The Urban Child Institute, and The State of Children in Memphis and Shelby County Databook.

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