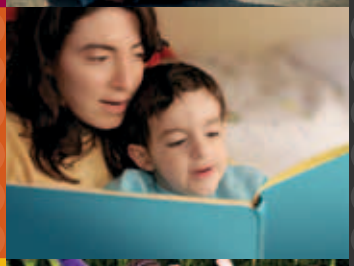

WITH SPECIAL INTEREST SECTION

Shelby County
Books from Birth

2012 ISSUE 7

DATA BOOK

The State of Children in Memphis and Shelby County

THE URBAN CHILD INSTITUTE®

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THE URBAN CHILD INSTITUTE®

Data Book 2012 Table of Contents

The Urban Child Institute Mission

The Urban Child Institute is a non-profit organization dedicated to the well-being and health of children from conception to three years old in Memphis and Shelby County. We are a data-driven, result-oriented coalition of researchers, strategists, practitioners, parents, and community members dedicated to turning knowledge and research into measurable change.

The Urban Child Institute is working to become a recognized leader in child advocacy research, a trustworthy community partner, and a place of choice for expertise, advice, and collaboration for those who want to improve the lives of children in Shelby County, Tennessee.

Data Book Purpose

The State of Children in Memphis & Shelby County was created by the Institute and first published in 2006. The initial purpose was to collect the best available data on children in our community. Many individuals and organizations were gathering important information on children, but the 2006 "Data Book" was the first time that the data had been assembled in a single document.

This 2012 volume continues to track and update the data. It has also become more focused on our community's youngest children, specifically those under age three. Additionally, the Institute is excited that the new Data Book includes contributions from some of our community's top experts in various fields related to children's well-being.

We hope that the Data Book will be a useful tool for government leaders, service providers, educators, and all community stakeholders who desire positive changes in Memphis and Shelby County. We believe that the evidence it presents for the importance of children's earliest years provides clear direction for community efforts to improve the lives of our children and the future of our community.

2012 Introduction

The Urban Child Institute has laid down the gauntlet: all young children in Shelby County must reach kindergarten fully prepared to learn and thrive.

The more we understand about the relationship between early brain development and lifetime success, the clearer it becomes that early experiences matter for shaping later outcomes, both for individuals and for the community.

Will a child develop a rich vocabulary? Will he become a strong reader? Will she develop the self-confidence needed to start school? These are key building blocks not only for kindergarten readiness, but also for school achievement, on-time graduation, and college enrollment. The foundation for these elements of success is established long before a child ever reaches school.

To increase children's kindergarten readiness, we need to understand the risks that threaten optimal development, as well as the experiences and interventions that help children beat the odds and thrive in school and life.

As the Data Book makes clear, many children confront adversity in early childhood. Over half of children in Shelby County live in low-income families. Children who face economic hardship in their early years are at far greater risk for poor life outcomes. These children are dealing with the toxic stress of residential instability, fragile families, and uncertain health, nutrition, and safety. Children in high stress environments must focus on learning to survive rather than learning to thrive.

While these risks are all too real, they tell us little about the experiences of individual children, and almost nothing about why some children beat the odds.

To understand the full story, we also need to identify the early experiences and interventions that help to protect children from adversity and toxic stress. This year's Data Book touches on three promising interventions. The first, the **Nurse-Family Partnership**, is a home visiting program for at-risk, first-time mothers. The program offers some of the strongest scientific evidence proving that high-quality interventions can move children and families from high-risk environments to a strong developmental pathway.

A second intervention making a real difference in our community is high-quality pre-kindergarten. Consistent with findings from across the country, pre-kindergarten in Memphis leads to stronger early language skills and promotes kindergarten readiness.

Finally, **Shelby County Books from Birth** brings more good news. A recent evaluation of that program found that Books from Birth is associated both with stronger family reading practices and higher measures of kindergarten readiness.

These are the types of real intervention moving children in our community from risk to resilience, leading not only to kindergarten readiness but also to life-long success.

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Acknowledgments

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The Institute is appreciative for domain contributions from several community researchers.

- **Health:** Jennifer Kmet, MPH, Senior Epidemiologist and Kristen Morrell, MPH, HIV/STD Epidemiologist of Shelby County Health Department, Epidemiology Section
- **Family & Home:** Marc Goodman-Bryan, M.A., Research Associate of The Urban Child Institute and Maureen Sorrells, MPH, CANDLE Data Analyst of The University of Tennessee Health Science Center
- **Education**: Doug Imig, Ph.D., Resident Fellow of The Urban Child Institute, Stephanie Donahue, Ph.D., Graduate Assistant of The University of Memphis, and Marie Sell, Ph.D., Research Evaluator of Memphis City Schools, Office of Evaluation
- **Special Interest- Shelby County Books from Birth Program:** Stephanie Donahue, Ph.D., Graduate Assistant of The University of Memphis and Shahin Samiei, MPH, Partner of Memphis City Schools Department of Research, Evaluation, and Assessment.
- **Community:** Robert Brimhall, M.A. and Jackson Gilman of River City GIS Consulting LLC
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The 2012 Data Book can be viewed and downloaded at www.theurbanchildinstitute.org.

Brain Development: Conception to Age 3

Decades of research show that the environment of a child's earliest years can have effects that last a lifetime. Thanks to recent advances in technology, we have a clearer understanding of how these effects are related to early brain development. Neuroscientists can now identify patterns in brain activity that are associated with various types of negative early experiences.[1]

Although the dangers of early stress, poverty, neglect and maltreatment have long been recognized, we can now 'see' their effects using brain scanning technology. Although scientists do not yet understand exactly how experiences affect development, dramatic advances continue to be made, and brain research continues to enhance education and intervention efforts.

The organization of a child's brain is affected by early experiences.

Specialized brain cells called neurons send and receive information by forming connections with one another. Although a newborn's brain already has about all of the neurons it will ever have, it continues to grow at an amazing rate. It doubles in size in the first year, and by age three it reaches 80 percent of its adult volume.[2-4]

Even more importantly, connections are formed at a faster rate during these years than at any other time. In fact, the brain creates many more connections than it needs: at age two or three, the brain has up to twice as many connections as it will have in adulthood (FIGURE 1). These surplus connections are gradually eliminated throughout childhood and adolescence, a process sometimes referred to as blooming and pruning.[5]

The excess connections produced by a child's brain in the first three years make the brain especially responsive to external input. During this period, the brain can "capture" experience more efficiently than it will be able to later, when the pruning of unused connections is underway.[5]

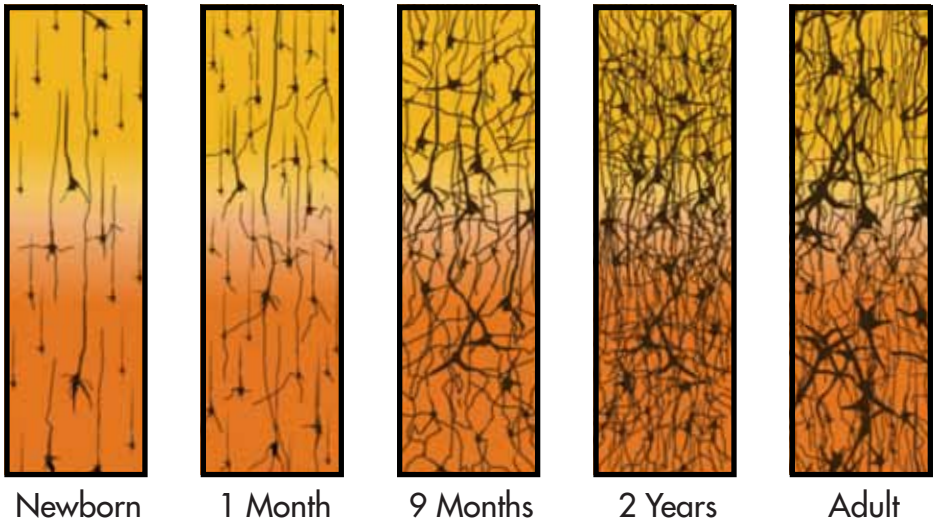


FIGURE 1:
Synapse Density Over Time

Source: Corel, JL. The postnatal development of the human cerebral cortex. Cambridge, MA: Harvard University Press; 1975.

Genetic and environmental factors work together to shape early brain development.

Although the first stages of brain development are strongly affected by genetic factors, genes do not design the brain completely.[6,7] Instead, genes allow the brain to fine-tune itself according to the input it receives from the environment. The brain's ability to shape itself lets individuals adapt to their surroundings more readily and more quickly than they could if genes alone determined the brain's wiring.[8] The interplay of genetic and environmental factors is becoming better understood thanks to recent research in a relatively new scientific field called epigenetics.

The field of epigenetics has changed our understanding of how genes interact with the environment.

Epigenetics is the study of enduring changes in gene activity that do not change the DNA code itself. Many environmental factors and experiences result in a chemical 'mark' on certain genes, and this epigenetic change can influence the activity, or 'expression', of the gene.[9]

Roughly speaking, epigenetic processes are the software that directs the functioning of a gene's DNA hardware. Because the development of all cells, tissues and organs is affected by when and how specific genes are expressed, epigenetic processes can be a powerful influence on health and well-being.

Animal research shows that epigenetic changes can be passed from one generation to the next.

So far, much of what we know about epigenetics comes from research on animals. Numerous studies show how genetic activity can be altered by exposure to different foods, toxins, and experiences. One experiment involved genetically identical pregnant mice who had yellow fur, were overweight, and showed higher-than-average susceptibility to certain diseases. Half of these mice received a normal diet during pregnancy while the other half was fed a diet high in compounds known to affect gene expression.

The offspring of the first group resembled their mothers in color, obesity, and vulnerability to disease. The offspring from the second group were more likely to have brown fur, normal weight, and no increased disease risk (FIGURE 2). But like their mothers, all of the offspring in both groups had identical DNA sequences. The differences in color, weight, and health were due to differences in the activity of a specific gene. The compounds in the experimental diet caused chemical changes that inhibited this gene's expression in the second group of mothers, and this epigenetic process affected their offspring.

Remarkably, these offspring eventually gave birth to babies that showed the same traits—brown fur, normal weight, and low disease risk—even though this third generation received a normal diet. This experiment and others like it show that although epigenetic changes do not alter the DNA sequence itself, they can be passed down to the next generation.

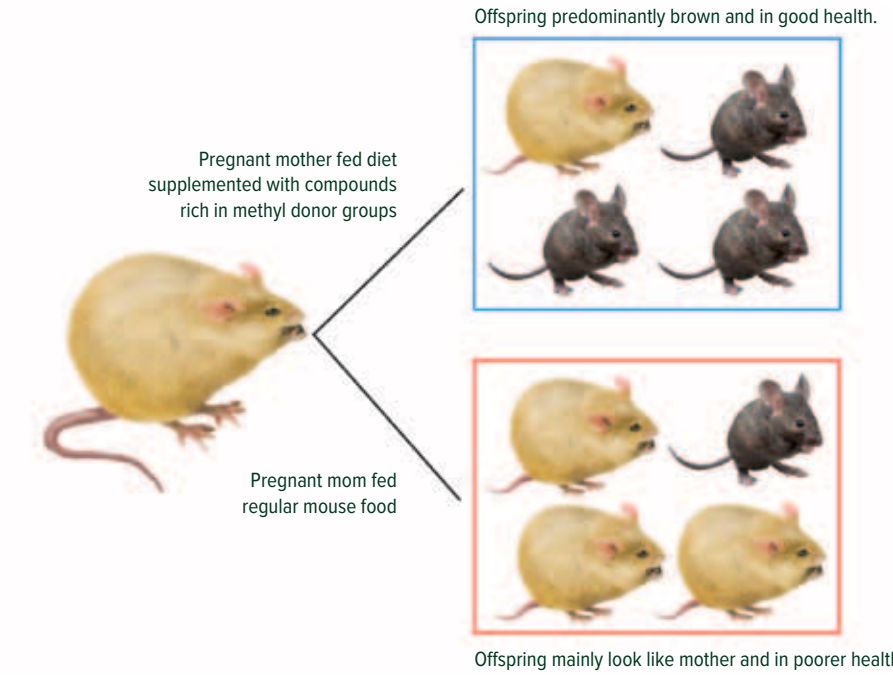


FIGURE 2:
Female Agouti Mouse (Fully Expressing a Gene That Causes Yellow Coat, Susceptibility to Diabetes and Obesity.)

Source: Illustration by Bill Day adapted from Waterland, RA., Jirtle, RL. Transposable elements: Target for early nutritional effects on epigenetic gene regulation. Molecular and Cellular Biology. 2003;23(15):5293-5300.

In another series of experiments, mice that received generous amounts of licking and grooming from their mothers were less anxious and had lower levels of stress hormones than those raised by mothers who showed anxious behavior and rarely nurtured their babies. A second phase of the experiment was designed to determine how much of this difference in stress was due to epigenetic factors. In this second procedure, offspring from the two types of mothers were exchanged immediately after birth.

The results showed the importance of early experience for the expression of specific genes. Babies born to high-nurturing mothers but raised by low-nurturing mothers developed high levels of anxious behavior similar to their foster moms. Babies born to low-nurturing mothers but raised by high-nurturing mothers showed less anxiety. In these offspring, a specific gene related to stress regulation was highly expressed, while in babies raised by low nurturing moms it remained inactive.[10]

Epigenetics is strongly related to early brain development.

We know that children's experiences during the first years of life are strongly associated with long-term cognitive, emotional, and social outcomes.[11] And we know that the quality of a child's early experiences affects the development and function of the growing brain. But discovering how these processes occur has been difficult. The growing body of research on epigenetic processes, which are especially active early in development,[12] is likely to provide new answers to how adversity threatens optimal development.

For ethical and practical reasons, it is harder to study the gene/environment relationship in humans than in animals. Still, scientists have already found convincing evidence of epigenetic effects in human development. In one study, women who were pregnant during a severe famine tended to give birth to underweight infants. When these babies grew up and became parents themselves, they also tended to have underweight children, even though their own food intake since birth had not been affected by the famine.[13] Other studies have found that childhood abuse is associated with lifelong decreased activation of a gene that protects against high levels of stress hormones.[9] Recent research has found that parents' stress levels during their children's first three years were associated with epigenetic markers that were still apparent when children reached age 15.[14]

Studies show that high stress and low nurturing in the first stages of life impair brain development through epigenetic changes that reduce the growth of brain cells and the formation of connections. These effects are especially dramatic in brain areas related to memory, learning, and social and emotional adjustment.[10]

Epigenetic research supports the importance of a preventive approach to child health and well-being.

Epigenetic processes indicate that development is remarkably flexible. But this doesn't mean that undesirable epigenetic changes can simply be reversed by changing a child's environment later in development. Epigenetic changes—and their effects on behavior and health—are relatively stable once they occur. Moreover, such changes can be transmitted from generation to generation. Whether they can become permanent is not yet known, but even when the conditions that created an epigenetic mark no longer exist, it is likely to take several generations before it begins to fade.[9]

In other words, epigenetics makes a strong argument that prevention is the best policy approach for protecting young children from the effects of harmful influences. Early exposure to chronic stress, negative parenting, inadequate nutrition, and other environmental hazards can have long-term effects on adult health and emotional well-being. A better understanding of epigenetic changes may help inform us how to develop more effective interventions to protect young children from adverse experiences in the first years of life.[15]

References

1. Lipina SJ, Colombo JA. *Poverty and Brain Development During Childhood: An Approach From Cognitive Psychology and Neuroscience*. Washington, DC: American Psychological Association; 2009.

2. Gilmore JH, Lin W, Prasatwa MW, et al. Regional gray matter growth, sexual dimorphism, and cerebral asymmetry in the neonatal brain. *Journal of Neuroscience*. 2007;27(6):1255-1260.

3. Nowakowski RS. Stable neuron numbers from cradle to grave. *Proceedings of the National Academy of Sciences of the United States of America*. 2006;103(33):12219-12220.

4. Rakic, P. No more cortical neurons for you. *Science*. 2006;313:928-929.

5. Huttenlocher P. *Neural Plasticity: The Effects of the Environment on the Development of the Cerebral Cortex*. Harvard University Press; 2002.

6. Kagan J, Herschkowitz N, Herschkowitz E. *A Young Mind in a Growing Brain*. Mahwah, NJ: Lawrence Erlbaum Associates; 2005.

7. Elman JL, Bates EA, Johnson MH, et al. *Rethinking Innateness: A Connectionist Perspective on Development*. Cambridge, MA: MIT Press; 1996.

8. Pascual-Leone A, Amedi A, Fregni F, et al. The plastic human brain cortex. *Annual Review of Neuroscience*. 2005;28:377-401.

9. McGowan PO, Szyf M. The epigenetics of social adversity in early life: Implications for mental health outcomes. *Neurobiology of Disease*. 2010; 39(1): 66-72.

10. Meaney, M. (2010). Epigenetics and the biological definition of gene x environment interactions. *Child Development*, 81(1), 41–79.

11. Duncan GJ, Ziol-Guest KM, Kalil A. Early childhood poverty and adult attainment, behavior, and health. *Child Development*. 2010; 81: 306–325.

12. Fagiolini M, Jensen CL, Champagne FA. Epigenetic influences on brain development and plasticity. *Current Opinion in Neurobiology*. 2009; 19:1-6.

13. Francis DD. Conceptualizing child health disparities: a role for developmental neurogenomics. *Pediatrics*. 2009; 124: S196–S202.

14. Essex MJ, Boyce WT, Hertzman C, et al. Epigenetic vestiges of early developmental adversity: Childhood stress exposure and DNA methylation in adolescence. *Child Development*. 2011; in press.

15. Shonkoff JP, Levitt P. Neuroscience and the future of early childhood policy: Moving from why to what and how. *Neuron*. 2010; 67: 689-691.

For Shelby County's children, Memphis and suburban Shelby County are two different worlds.

Shelby County has nearly a quarter of a million children. Over 70 percent live in Memphis; the rest live in the outlying suburbs (FIGURE 1). On the whole, these two groups of children lead very different lives, with different opportunities for early experiences that promote healthy brain development and lifelong achievement.

Family resources strongly influence a child's chances for success.

Even in the first years of life, children's development is affected by family resources like parents' income and education. Parents with fewer resources are at higher risk for stress, poor physical and mental health, and other problems that can lead to ineffective parenting and problematic home environments.

The links between children's early experiences and their long-term outcomes are well documented. But until recently, the underlying mechanisms were poorly understood. Neuroscientists now have the technology to detect differences in brain activity among disadvantaged children and better-off children. These differences are especially dramatic in brain areas associated with language, memory, and other cognitive abilities.[1-3]

In short, there is a growing body of evidence which suggests that the experiences faced by children in disadvantaged families can affect brain development in ways that impair later abilities and achievement. This chapter presents a brief overview of the child population of Shelby County, with an emphasis on how children's early circumstances often vary between Memphis and suburban Shelby County.

(Please note that throughout the Data Book "suburban Shelby County" refers to areas of the county outside the city limits of Memphis, while "Shelby County" refers to the county as a whole, including Memphis.)

Children in Memphis, as a group, differ from suburban children in age, race, and family type.

FIGURE 2 shows the age distribution of children in Memphis and in suburban Shelby County. Memphis has a higher proportion of very young children than suburban Shelby County.

- Memphis has over 30,000 children under three, representing 18 percent of all residents under 18.
- In suburban Shelby County, children under three make up 14 percent.

FIGURE 1: Number & Percent of Children Living in Memphis and Suburban Shelby County, 2010

Source: American Community Survey, 2010, B01001

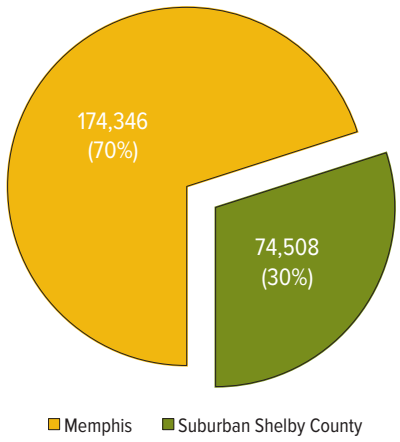
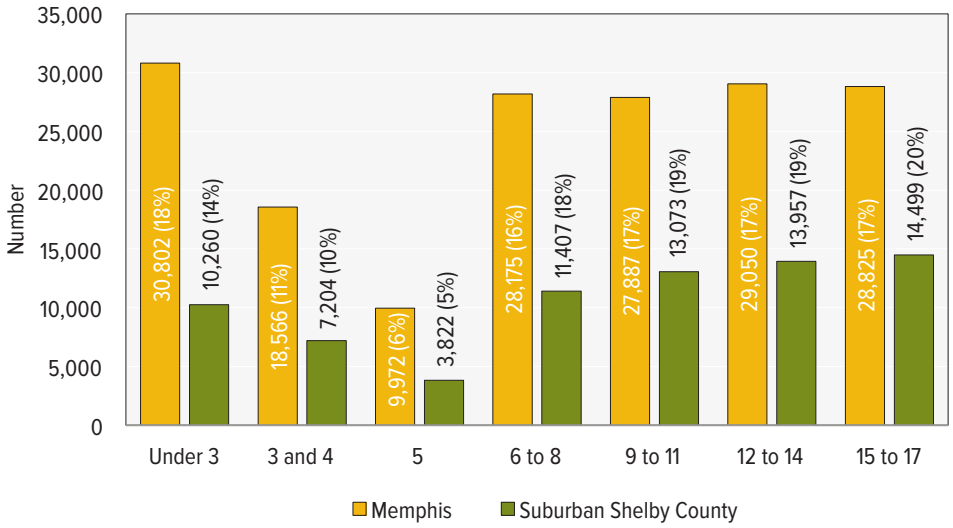


FIGURE 2: Number & Percent of Children by Age, Memphis and Suburban Shelby County, 2010

Source: American Community Survey, 2010, B01001



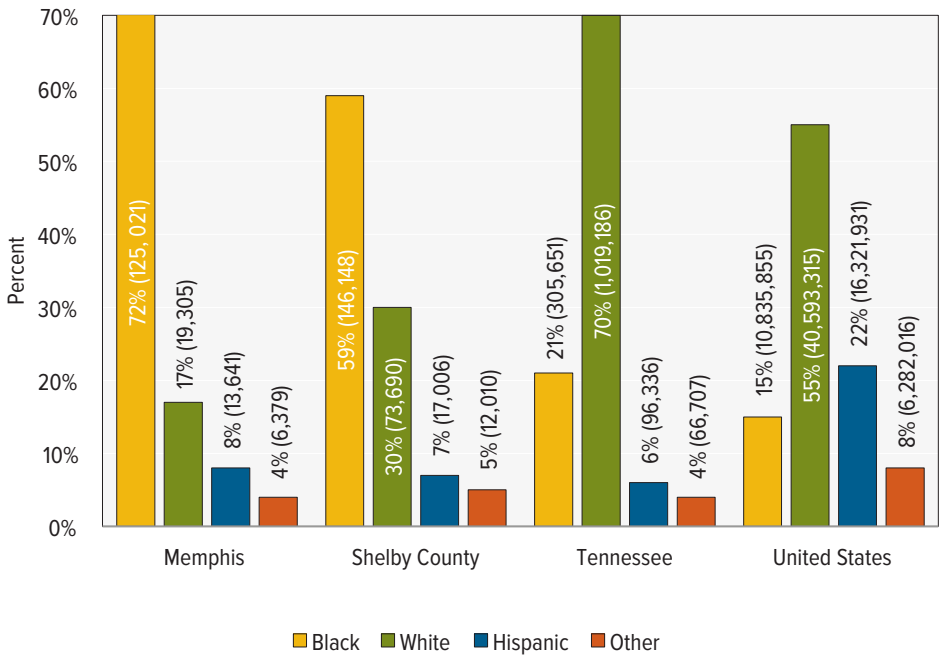


FIGURE 3:
Number & Percent of Children by Race in the U.S., T.N., Shelby County and Memphis, 2010

Source: American Community Survey, 2010, C01001B, C,D,E,F,H&I

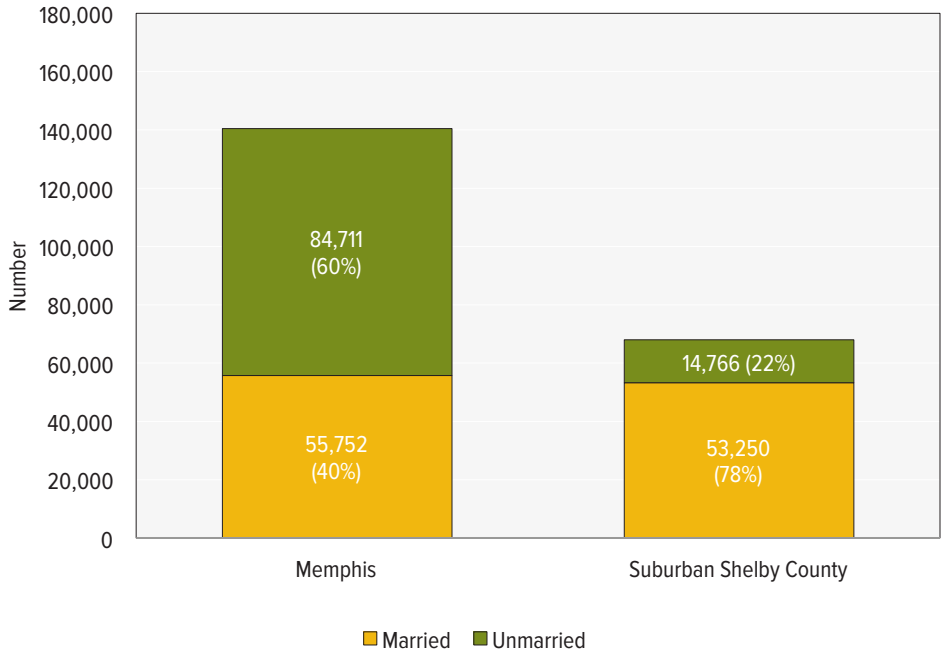
Our community's black-white ratio is different from that of the state and nation.

FIGURE 3 shows the racial/ethnic differences among the child populations of Memphis, Shelby County, Tennessee, and the U.S. Racial demographics in Memphis differ from those of Tennessee and the U.S.

- 72 percent of children in Memphis are black and 17 percent are white.
- In Shelby County as a whole, the pattern is similar but less pronounced (59 and 30 percent respectively).
- Statewide and nationally, however, the black-white ratio is roughly the opposite of our community.
- For other racial/ethnic groups, patterns in Memphis and Shelby County are similar to state and national patterns.

FIGURE 4:
Number & Percent of Children by Living Arrangement, Memphis and Suburban Shelby County, 2010

Source: American Community Survey, 2010, C17006



Memphis children are more likely than their suburban peers to live in single-parent families.

FIGURE 4 shows differences in living arrangements between children in Memphis and children in suburban Shelby County.

- 60 percent of Memphis children live with an unmarried parent.
- 22 percent of children in suburban Shelby County live with an unmarried parent.

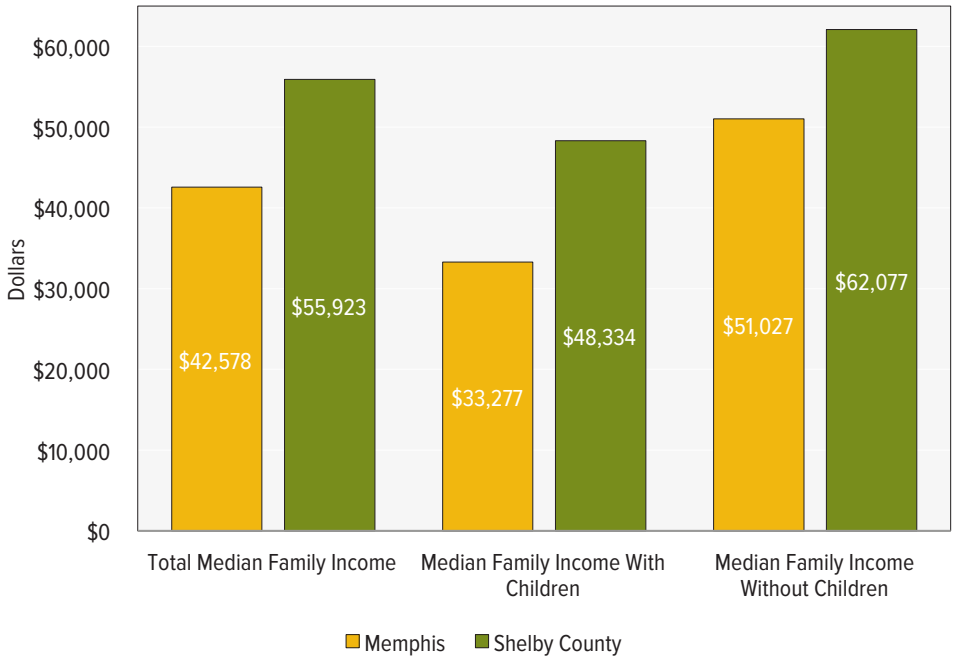


FIGURE 5: Median Family Income by Presence of Children, Memphis and Shelby County, 2010

Source: American Community Survey, 2010, B19125

Shelby County families with children make less money than families without children.

Family income affects the quality of a child's home environment. Parents with stable and adequate incomes are better able to provide their children with books, educational toys, enriching activities, and high-quality child care. Children whose families have higher incomes tend to do better in school and show better behavioral and social adjustment.[4]

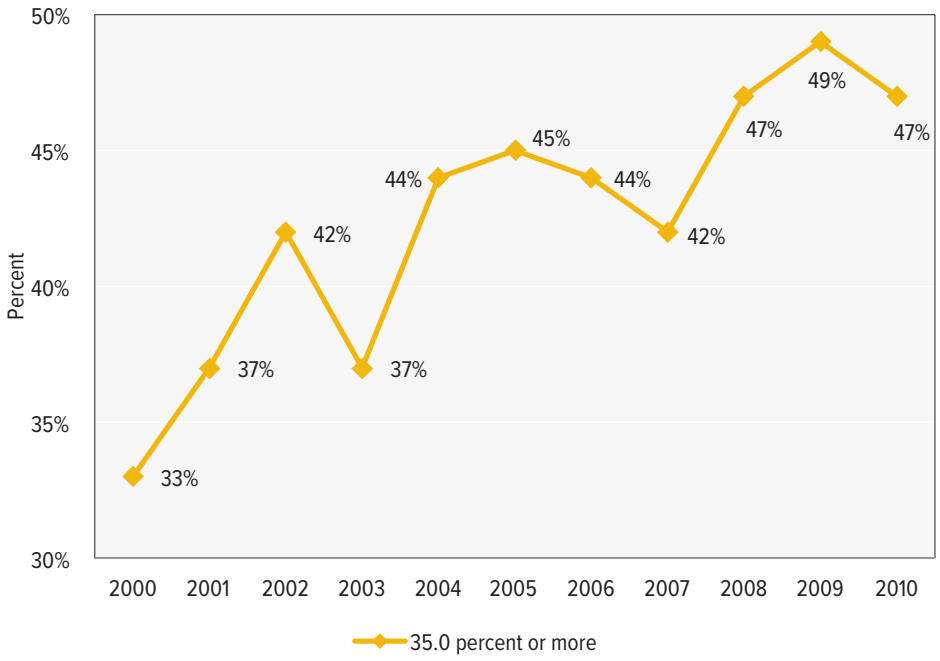
Low-income parents, in addition to having fewer economic resources, often have fewer social and emotional resources. Compared to middle-class parents, for example, they are at higher risk for stress and poor health. Economic hardship can lead to less parental warmth and responsiveness, which in turn are associated with negative child outcomes.[5]

FIGURE 5 shows median income for families with children and for families without children in Memphis and in Shelby County as a whole.

- Across Shelby County, median income for families without children is almost $14,000 more than for families with children.
- When we consider only families living within Memphis, the gap increases to almost $18,000.

FIGURE 6: Gross Rent as Percent of Household Income, Shelby County 2000-2010

Source: American Community Survey, 2010, B25070



Shelby County families pay a larger share of their incomes for rent than in previous years.

Housing is typically the biggest item in a family's budget. Experts agree that a family should spend no more than about 30 percent of its annual income on housing, but poor and low-income families often pay as much as 50 percent.

Families with children are particularly vulnerable to unaffordable housing: they earn less than other families, but need more space. When less income is left over after paying the rent, parents must make sacrifices that can reduce their children's quality of life. Too often, these choices include cutting back on necessities like food, clothes, and healthcare.[6,7]

FIGURE 6 shows recent changes in the percentage of renting families in Shelby County who pay 35 percent or more of their incomes on rent. Since 2000, more and more families face housing costs that are well above the recommended 30 percent threshold.

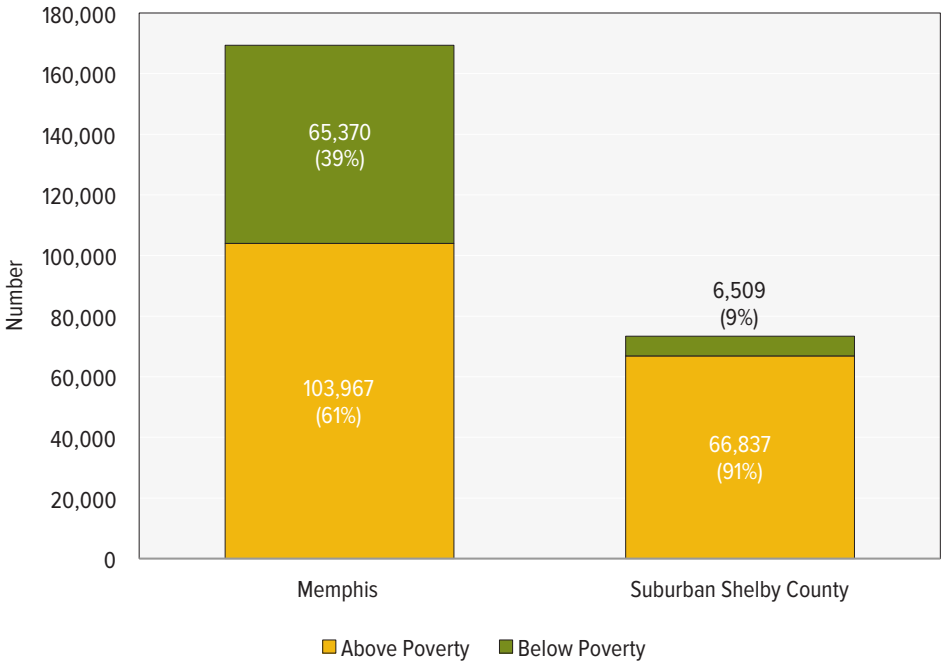


FIGURE 7:
Number & Percent of Children in Poverty, Memphis & Suburban Shelby County, 2010

Source: American Community Survey, 2010, C17001

The Memphis child poverty rate is double the national rate.

The terms "poor" and "in poverty" are applied to families with annual incomes below the Federal Poverty Level (FPL) set by the U.S. Department of Health and Human Services. FPL for a family of four is $22,050.

Poverty endangers children's healthy development. Poor families experience, on average, more turmoil, violence, and instability than other families. Poor children watch more TV, have fewer books, and are read to less frequently than their better-off peers. They attend lower-quality schools and have poorer nutrition. As early as the first three years of life, they score lower on cognitive measures, and the effects of early poverty often persist into adulthood. [8-11]

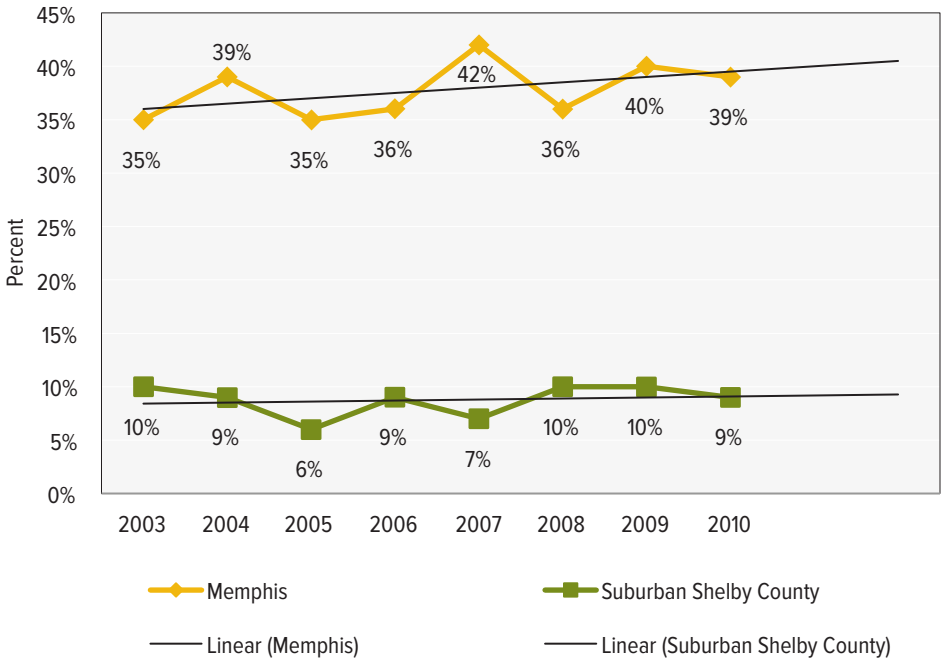
FIGURE 7 compares child poverty rates in Memphis and suburban Shelby County.

Shelby County child poverty is largely concentrated in Memphis.

- In Memphis, 39 percent of children live in poverty.
- Nine percent of children in suburban Shelby County live in poverty.
- The national child poverty rate is 19 percent (not shown).

FIGURE 8:
Percent of Children in Poverty, Memphis and Suburban Shelby County, 2003-2010

Source: American Community Survey, 2003-2010, C17001



Child poverty is increasing in Memphis but not in suburban Shelby County.

FIGURE 8 compares child poverty rates for Memphis and suburban Shelby County since 2003.

- Child poverty has been relatively steady in suburban Shelby County in recent years.
- In Memphis, there has been a slight upward trend.

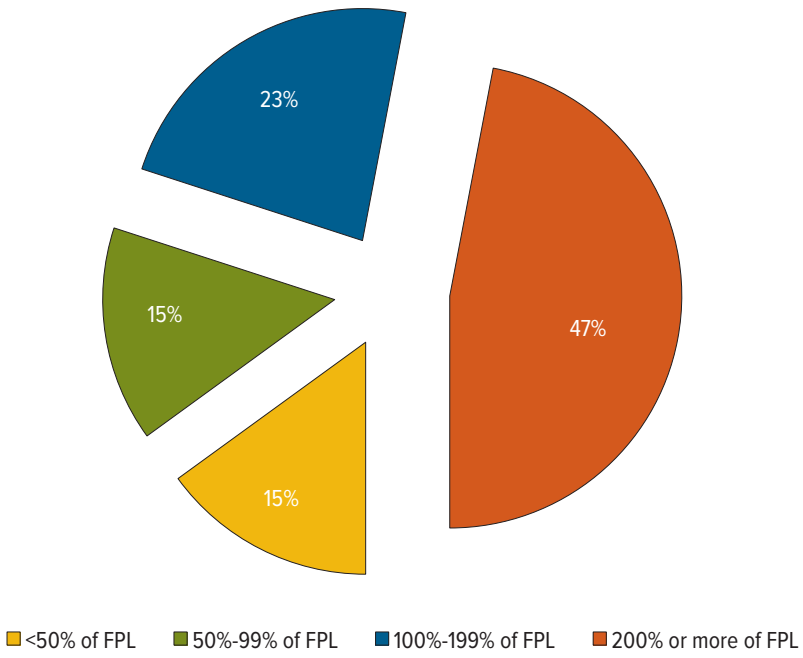


FIGURE 9: Percentage of Children by Living Standard, Shelby County 2010

Source: American Community Survey, 2010, C17024

Over half of Shelby County children face economic hardship.

The Federal Poverty Level (FPL) is an inadequate tool for measuring economic hardship. Grouping families into those above the poverty threshold and those below it underestimates the wide variations in economic distress among families in need.

Not all poor families experience the same types of hardship. Families with incomes just under the poverty line face very different circumstances than families whose incomes fall far short of it.

Similarly, many families have incomes above FPL but still deal with the same difficulties as poor families. Extensive research shows that it takes an income about twice the poverty level for a family to meet its basic needs.

As a result, most researchers distinguish two additional categories: low-income (also called "near poverty") and extreme poverty. Low-income families have incomes above FPL but below 200 percent of FPL. Families with incomes below half of the FPL are in extreme poverty.[12-14]

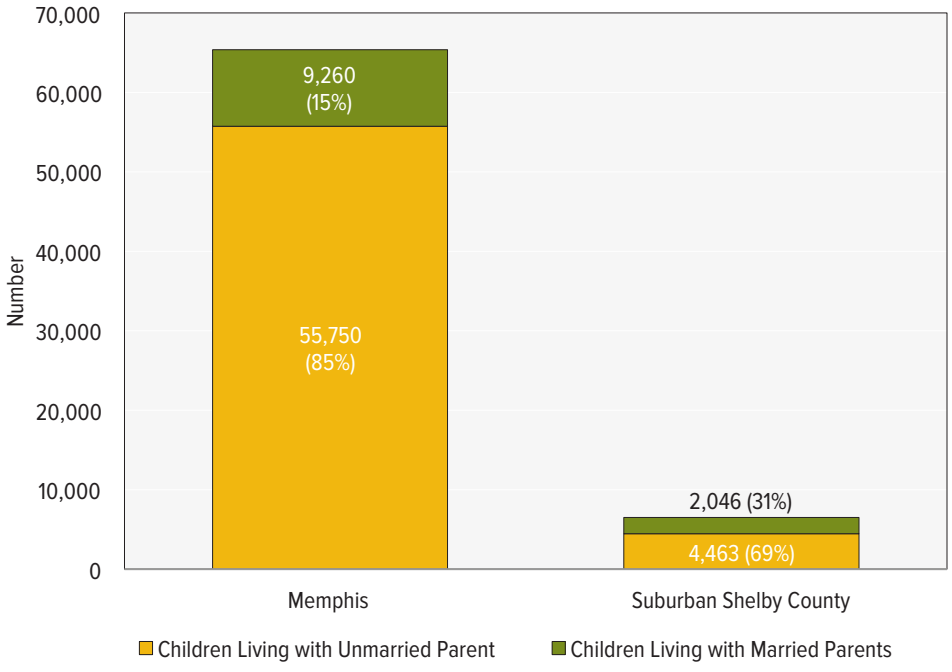
FIGURE 9 shows the living standards of Shelby County children according to family income and FPL.

More than half of our community's children are poor or low-income.

- 30 percent of Shelby County children are living in poverty.
- Of this 30 percent, half are in extreme poverty.
- 23 percent of children in Shelby County live in low-income families.
- Fewer than half of Shelby County's children are economically secure (at or above 200 percent of FPL).

FIGURE 10: Number & Percent of Children Living in Poverty by Living Arrangement, Memphis & Suburban Shelby County, 2010

Source: American Community Survey, 2010, C17006



Children in poverty often face other risks as well.

Poor children often thrive in spite of their families' economic adversity, especially if they have the protective benefits of warm and responsive parenting. Too often, however, poverty goes hand in hand with other risks that reduce parents' ability to provide this buffer. These may include maternal depression, low parental education, and neighborhood crime.

One widely studied risk factor is living in a single-parent family. Single-mothers, on average, are younger, have less education, earn lower incomes, and have less social support than married mothers. Conditions like these increase the likelihood of ineffective, inconsistent, and harsh parenting behaviors.[15,16]

FIGURE 10 shows living arrangements among poor children in Memphis and suburban Shelby County.

- In Memphis, 85 percent of children in poverty live in unmarried-parent families.
- Similarly, in suburban Shelby County, 69 percent of poor children live in unmarried-parent families.

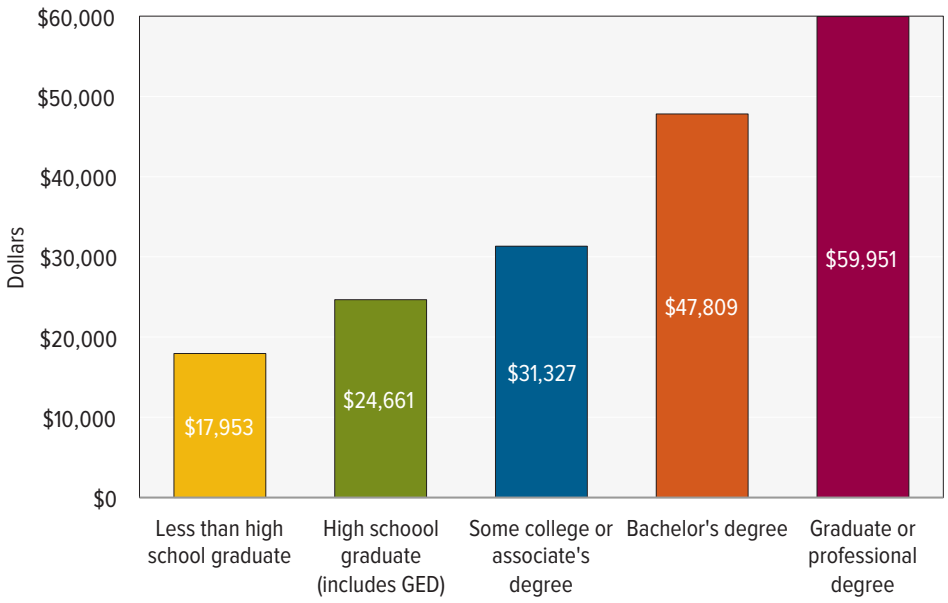


FIGURE 11: Median Annual Income by Educational Attainment, Shelby County, 2010

Source: American Community Survey, 2010, B20004

Kids are better-off when their parents are better-educated.

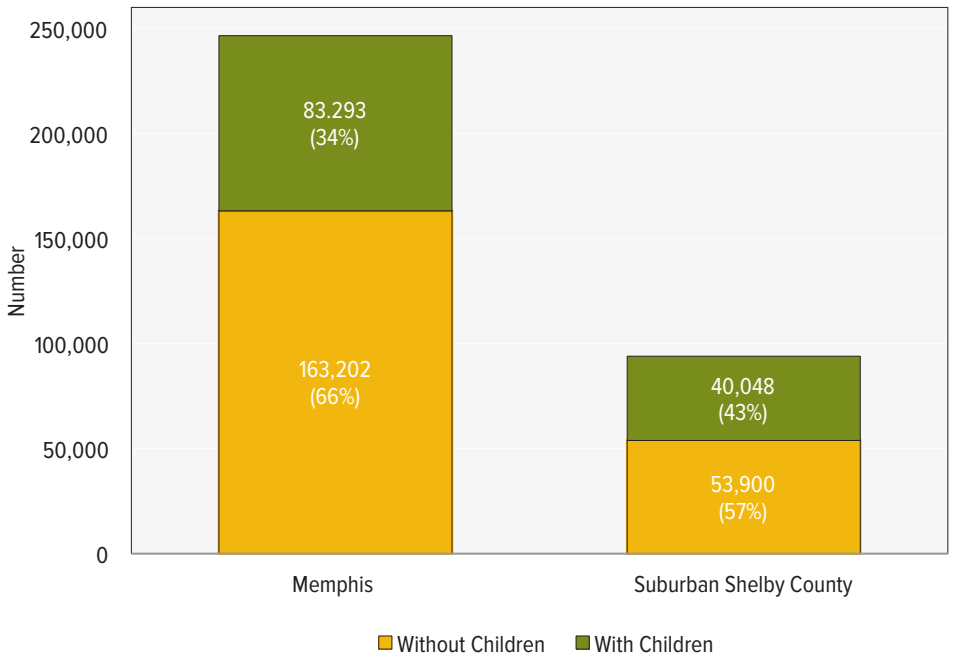
Education helps parents earn more money, allowing them to improve their children's physical surroundings and purchase books and other stimulating materials. It also promotes effective parenting: on average, better-educated parents read to their children more often, use larger vocabularies, and have higher expectations. Their children, in turn, tend to have better academic and behavioral outcomes.[17,18]

FIGURE 11 shows how median annual income varies according to educational attainment for Shelby County adults.

- High school graduates earn 37 percent more than high school dropouts.
- Attending some college, even without finishing a degree, raises a high school graduate's income another 27 percent.
- For those who complete a Bachelor's degree, median income is double that of high school graduates.

FIGURE 12:
Number & Percent of Households by Presence of Children, Shelby County, 2010

Source: American Community Survey, 2010, C11005



Most Shelby County homes do not have children.

FIGURE 12 shows the number and percentage of families with children for Memphis and suburban Shelby County.

- Only 34 percent of households in Memphis have children younger than 18 years present.
- Only 43 percent of households in suburban Shelby County have children.

Families with children are a minority in our community. This is a potential barrier to building and sustaining an effective public voice for children. For instance, supporting investments in child well-being may be a lower priority for adults without children or those whose children have already come of age.[19]

Investments in the well-being of our children are investments in our community's future.

The differences between Memphis and suburban Shelby County, many of which have been detailed in this chapter, may represent another barrier to positive change. Suburban Shelby County has a higher share of families with children, but it has proportionately fewer African American children, children in poverty, and children in single-parent families. These realities tend to isolate middle-class families from families in need and make it difficult to create a shared identity among parents and caregivers throughout our community.[20]

To overcome these obstacles, we must increase public awareness and advocate that what is good for children is good for all of us. Morally, allowing half our children to grow up in or near poverty is incompatible with our ideals of fairness and equal opportunity. Economically, reducing child poverty and its lifelong effects will result in significant public savings by increasing earnings and productivity and decreasing crime and poor health.[21]

References

1. Bradley RH, Corwyn RF. Socioeconomic status and child development. *Annual Review of Psychology*. 2002; 53: 371-399.

2. Farah MJ, Shera DM, Savage JH, et al. Childhood poverty: specific associations with neurocognitive development. *Brain Research*. 2006; 1110(1): 166-174.

3. Kishiyama M, Boyce W. Socioeconomic disparities affect prefrontal function in children. *Journal of Cognitive Neuroscience*. 2008; 21(6): 1106-1125.

4. Dearing E, McCartney K, Taylor BA. Change in family income-to-needs matters more for children with less. *Child Development*. 2001; 72(6): 1779-1793.

5. Yeung WJ, Linver MR, Brooks-Gunn J. How money matters for young children's development: parental investment and family processes. *Child Development*. 2002; 73(6): 1861-1879.

6. Quigley JM, Raphael S. Is housing unaffordable? why isn't it more affordable? *The Journal of Economic Perspectives*. 2004; 18(1): 191-214.

7. Schwartz M, Wilson E. Who can afford to live in a home? A look at data from the 2006 American Community Survey. *US Census Bureau*. Available at: http://www.census.gov/hhes/www/housing/special-topics/files/who-can-afford.pdf Accessed March 20,2011.

8. Ganzel BL, Morris PA, Wethington E. Allostasis and the human brain: integrating models of stress from the social and life sciences. *Psychological Review*. 2010; 117(1): 134-174.

9. Brooks-Gunn J, Duncan GJ. The effects of poverty on children. *The Future of Children*. 1997; 7(2): 55-71.

10. Evans GW. The environment of childhood poverty. *American Psychologist*. 2004; 59(2): 77–92.

11. Evans GW, Schamberg MA. Childhood poverty, chronic stress, and adult working memory. *Proceedings of the National Academy of Sciences*. 2009; 106(16):6545.

12. Chau M. Low-income children in the United States: national and state trend data, 1998-2008. *National Center for Children in Poverty Report*. Available at: http://www.nccp.org/publications/pub_907.html Accessed March 5, 2011.

13. Gershoff ET. Living at the edge: low income and hardship among America's kindergarteners. *National Center for Children in Poverty Research Brief No. 3*. Available at: http://www.nccp.org/publications/pub_530.html Accessed March 5, 2011.

14. Lin J, Bernstein J. What we need to get by: a basic standard of living costs $48, 778, and nearly a third of families fall short. *Economic Policy Institute* Briefing Paper No. 224. Available at: http://www.epi.org/publications/entry/bp224/ Accessed March 18, 2011.

15. Carlson MJ, Corcoran ME. Family structure and children's behavioral and cognitive outcomes. *Journal of Marriage and Family*. 2001; 63(3): 779-792.

16. McLanahan SS, Sandefur G. *Growing Up with a Single parent: What Hurts, What Helps*. Harvard University Press; 1994.

17. Carneiro P, Meghir C, Parey M. Maternal education, home environments and the development of children and adolescents. *Institute for Fiscal Studies* Working Paper 15/07. Available at: http://www.ifs.org.uk/wps/wp1507.pdf Accessed March 1, 2011.

18. Dubow EF, Boxer P, Huesmann LR. Long-term effects of parents' education on children's educational and occupational success. *Merrill-Palmer Quarterly*. 2009; 55(3): 224-249.

19. Isaacs JB. A comparative perspective on public spending on children. *Brookings Institution* Working Paper. Available at: http://www.brookings.edu/~/media/Files/rc/reports/2009/1105_spending_children_isaacs/2_comparative_perspective_isaacs.pdf Accessed March 19, 2011.

20. Imig D. Mobilizing parents and communities for children. In DeVita CJ, Mosher-Williams R, eds. *Who Speaks for America's Children: The Role of Child Advocates in Public Policy*. Washington, DC: Urban Institute Press; 2001: 191-207.

21. Holzer HJ, Schanzenbach DW, Duncan GJ, et al. The economic costs of childhood poverty in the United States. *Journal of Children and Poverty*. 2008; 14(1): 41-61.

The well-being of children determines the health of future generations.

Improving the well-being of mothers, infants and children is an important public health goal in the United States. Too many of our community's children face serious health risks from the beginning of their lives. In Memphis and Shelby County, rates of infant mortality, prematurity, and low-birth-weight remain disproportionately high. The prevalence of teen parenthood, single-parent families, inadequate prenatal care and other risk factors continue to affect the health outcomes of our mothers and children.

According to a 2011 report by the Annie E. Casey Foundation, Tennessee has shown improvements over the past three years in children's educational, social, economic, and physical well-being. Shelby County, however, continues to perform poorly on most measures of child health.[1]

Adversities faced by children in their first years can have effects that last a lifetime. Healthy birth outcomes and early identification and treatment of health problems among infants can improve outcomes and enable children to reach their full potential.[2] This section of the Data Book examines some of the most common risk factors that jeopardize our community's maternal and child health.

Healthy births are an important indicator of community well-being.

Birth outcomes are a key measure of a community's overall health. The most commonly studied outcomes include

- infant death
  (death during the first year after birth)
- premature birth
  (birth before 37 weeks' gestation)
- low-birth-weight
  (less than 2500 grams, or 5 lbs., 8 oz.)

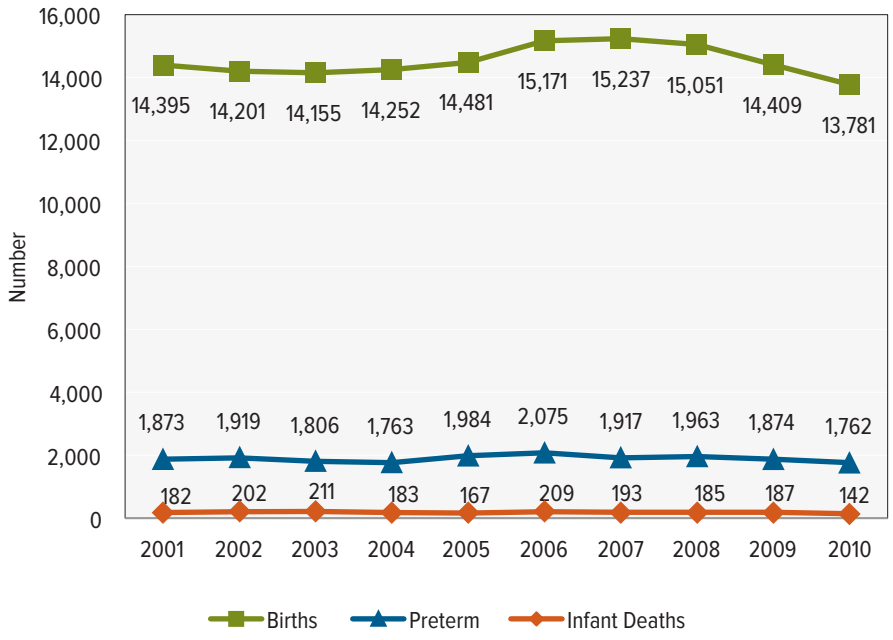
Infant death is typically reported as the *infant mortality rate*—the number of infant deaths per 1000 live births. This measure is widely used across the world as an overall measure of community health status. Prematurity and low-birth-weight are among the leading causes of infant mortality. Others include irreversible conditions such as congenital malformations, deformities, and chromosomal abnormalities.[3]

Preterm birth statistics are usually reported as a percentage of all live births. Babies born preterm are at increased risk for health complications such as jaundice, anemia and infection. Longer-term complications can include learning and behavioral problems, cerebral palsy, and vision and hearing loss.[4]

Low-birth-weight is also reported as a percentage of all live births. Low-birth-weight is often a result of premature birth, but it can also occur in full term babies affected by fetal growth restriction. Low-birth-weight babies are more likely to have respiratory complications, immature livers, anemia, and trouble maintaining a normal body temperature. Feeding problems may also occur, and the risk for infection is increased.[5]
In addition, low-birth-weight has been linked to childhood educational problems, even after accounting for other factors.[6]

FIGURE 1: Number of Total Live Births, Preterm Births & Infant Deaths, Shelby County, 2001-2010

Source: Tennessee Department of Health, Office of Policy, Planning and Assessment, Division of Health Statistics, Birth and Death Record data 2001-2010



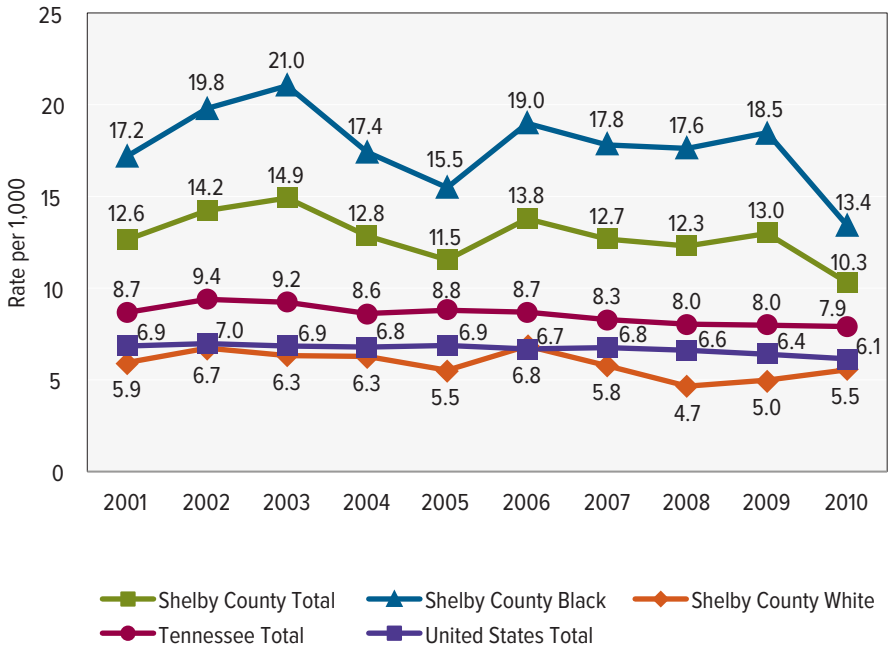


FIGURE 2:
Infant Mortality Rate per 1,000 Live Births by Race, Shelby County, Tennessee & United States, 2001-2010

Source: TN Dept. of Health, Office of Policy, Planning & Assessment, Division of Health Statistics, Death Record Data 2001-10; National Center for Health Statistics, Vital Statistics Reports, Deaths: Final Data. 2008;59(10).

http://www.cdc.gov/nchs/data/nvsr/nvsr59/nvsr59_10.pdf; National Center for Health Statistics, Vital Statistics Reports, Deaths: Preliminary Data. 2010;60(4) http://www.cdc.gov/nchs/data/nvsr/nvsr60/nvsr60_04.pdf

FIGURE 1 shows Shelby County's number of births, infant deaths, and preterm births in 2010.

- 13,781 babies were born.
- 142 died during infancy.
- 1,762 were born prematurely.

The raw numbers tell only part of the story. For a better understanding, we need to examine the infant mortality rate and the percentage of preterm births:

- The Shelby County infant mortality rate declined between 2009 and 2010 (from 13 to 10.3 infant deaths per 1,000 live births) (FIGURE 2).
- Still, it remains more than 50 percent higher than the national rate of 6.1 (FIGURE 2).
- The percentage of preterm births in Shelby County (12.8 % in 2010) has remained relatively stable and is slightly higher than the national percentage (12% in 2010)(FIGURE 3).
- The 2010 percentage of low-birth-weight births in Shelby County (11.1%) remains above the state and national percentages (FIGURE 4).

FIGURE 3:
Percent of Preterm Babies by Race, Shelby County, Tennessee & United States, 2001-2010

Source: TN Dept. of Health, Office of Policy, Planning & Assessment, Division of Health Statistics, Birth Record Data 2001-2010; National Center for Health Statistics, Vital Statistics Reports, Births: Final Data for 2009.

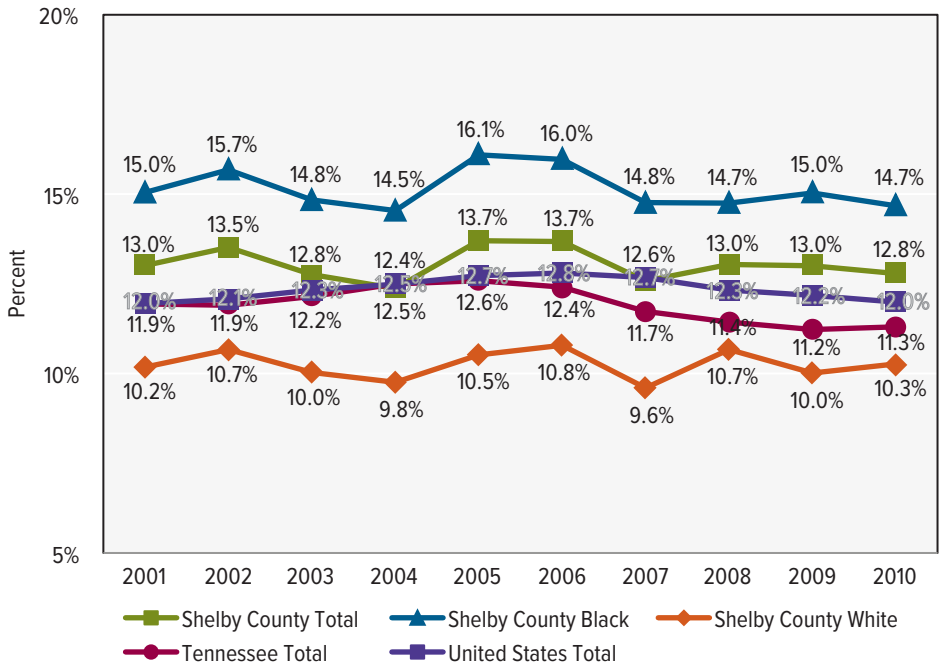


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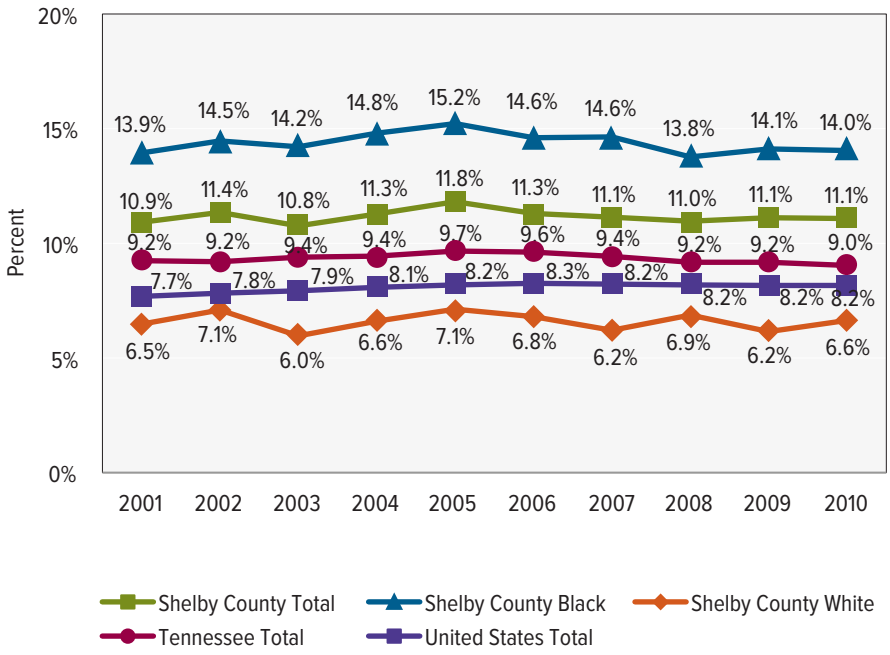
FIGURE 4:
Percent of Low Birth-Weight Babies by Race, Shelby County, Tennessee & United States, 2001-2010

Source: TN Dept. of Health, Office of Policy, Planning & Assessment, Division of Health Statistics, Birth Record Data 2001-2010; National Center for Health Statistics, Vital Statistics Reports, Births: Final Data for 2009.



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Healthy births in our community fall short of the Healthy People 2020 Goals.

The Healthy People 2020 Objectives identify birth outcomes as leading health indicators for maternal, infant and child health in the United States.[2] Preterm births have risen by more than 20% in the United States from 1990 to 2006,[7] while the infant mortality rate reported in 2011 remained higher than 46 other countries.[8]

- The percentage of preterm births in Shelby County in 2010 (12.8%) remained above the Healthy People 2020 target (11.4%).
- The 2010 percentage of low-birth-weight births in Shelby County (11.1%) remains above the Healthy People 2020 goal of 7.8%.
- Shelby County's infant mortality rate is twice the Healthy People 2020 Goal of 6.0 deaths per 1,000 live births.

Racial disparities in Shelby County birth outcomes remain large.

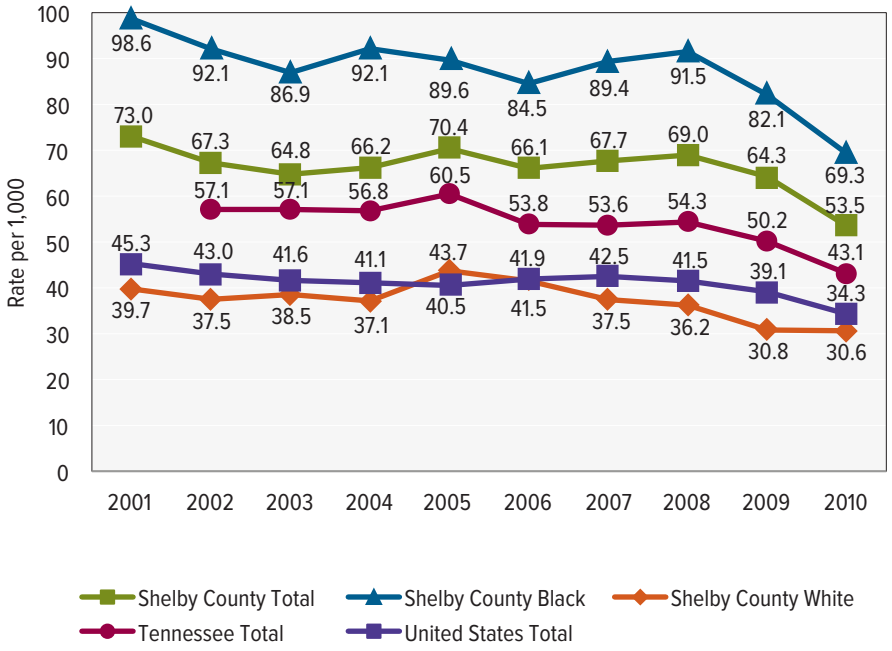
Locally, statewide, and nationally, figures show that birth outcomes vary by race. While racial disparities in infant mortality are related to several risk factors, such as preterm and low-birth-weight delivery, socioeconomic status and access to medical care, these differences only partially explain the observed disparities.

- In Shelby County, the infant mortality rate among infants born to black women decreased by about 25 percent (18.5 to 13.4 deaths per 1,000 live births) from 2009 to 2010. However, the rate remains more than double that of infants born to white women **(FIGURE 2)**.
- In 2010, 14.7 percent of babies born to black women were born preterm, compared to 10.3 percent of babies born to white women. This racial gap has remained relatively unchanged over the past ten years, with black women consistently reporting a higher percentage of preterm births than white women **(FIGURE 3)**.
- Black women consistently report the highest percentage of low-birth-weight births. In 2010 the black low-birth-weight percentage (14.0%) was approximately twice the white percentage of 6.6 percent **(FIGURE 4)**.

The causes of racial disparities in preterm births remain uncertain, and traditional factors such as smoking and prenatal care do not fully explain them. Evidence suggests that residential segregation may be an important social determinant of racial preterm birth disparities present in US metropolitan areas. In addition, higher rates of urogenital infections identified among black women may account for part of the racial gap.[9-12]

FIGURE 5:
Birth Rate per 1,000 Females Ages 15-19 Years by Race, Shelby County, Tennessee & United States, 2001-2010

Source: TN Dept. of Health, Office of Policy, Planning & Assessment, Division of Health Statistics, Birth Record Data 2001-2010; American Community Survey 1-Year Estimates, United States Decennial Census 2010, National Center for Health Statistics, Vital Statistics Reports, Births: Final Data for 2009



http://www.cdc.gov/nchs/data/nvsr/nvsr60/nvsr60_01.pdf; National Center for Health Statistics, Vital Statistics Reports, Births; Preliminary Data. 2010 http://www.cdc.gov/nchs/data/nvsr/nvsr60/nvsr60_02.pdf

Teenage birth rates have declined but remain high.

Teen pregnancy and childbearing can have substantial immediate and long-term effects on teen parents and their children. Pregnancy and birth are significant contributors to high school dropout rates among girls.[13] In addition, children of teenage mothers are more likely to have lower achievement, to drop out of high school, to have more health problems, to be incarcerated during adolescence, to give birth as a teenager, and to face unemployment as adults.[14]

The *teen birth rate* is usually reported as the number of births per 1,000 women aged 15-19.

Shelby County's 2010 teen birth rate reached a record low since 2001 and represents a reduction of 22 percent since 2008 (FIGURE 5):

- 1,904 infants (14% of all births) were born to teenagers, for a teen birth rate of 53.5 per 1,000 teens.
- The decline in the black teen birth rate period is even larger; since 2008, black birth rates have dropped 32 percent.
- Nevertheless, substantial racial disparities persist in teen birth rates: Black teens have a birth rate over twice the rate among white teens.

Nationally, the proportion of adolescents who report having ever had sex has declined substantially since the early 1990's; however, reasons for record-low teenage births in the United States remain unclear.[15,16] A national school-based survey administered locally by Memphis City Schools shows a decline from 2005 to 2009 among Memphis students who report ever engaging in sexual intercourse (67.1% to 61.6%). The survey also reported an increase among females using birth control before last sexual intercourse (from 6.5% in 2005 to 11.5% in 2009). However, neither change was statistically significant.[17]

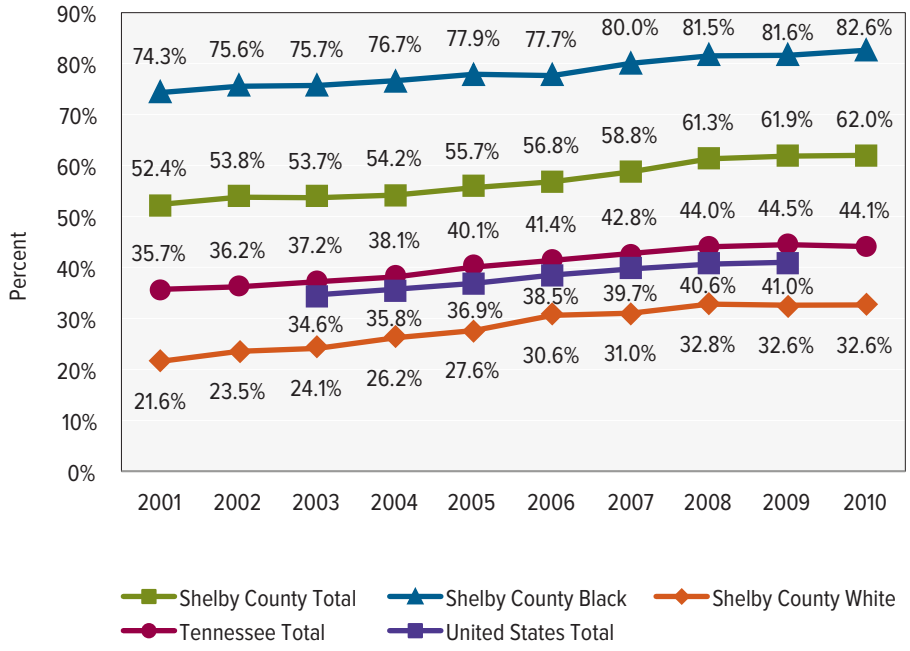


FIGURE 6: Percent of Births to Unmarried Parents by Race, Shelby County, Tennessee & United States, 2001-2010

Source: Tennessee Department of Health, Office of Policy, Planning and Assessment. Division of Health Statistics, Birth Record Data 2001-2010; CDC Wonder 2003 - 2009, http://wonder.cdc.gov/natality.html

Births to unmarried mothers are increasing.

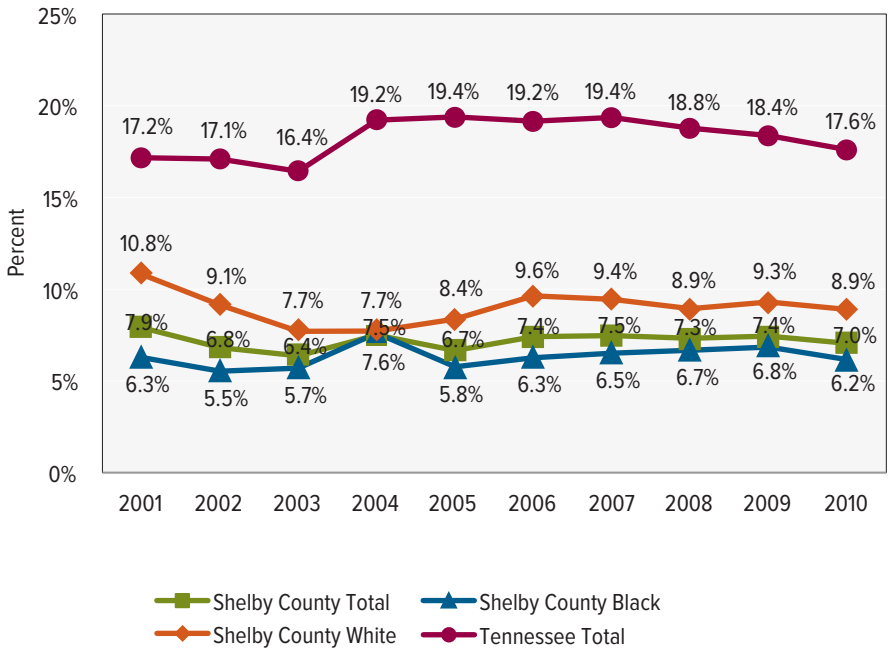
Research shows that children of unmarried mothers are at higher risk for adverse birth outcomes than children born to married women.[18,19] In Tennessee, infants born to unmarried mothers have an infant mortality rate that is up to twice that of infants born to married mothers.[3] In addition, children born to single-mothers tend to have fewer social and financial resources and more academic, emotional and behavioral problems.[20,21]

In 2010, the percentage of unmarried births in Shelby County continued to rise (FIGURE 6):

- 62 percent of all Shelby County births were to unmarried mothers, up from 52.4 percent in 2001.
- A similar trend is observed across Tennessee, but with a slight decrease observed in the past year.
- In Shelby County, 82.6 percent of births among black women were to unmarried women, compared to 32.6 for white women.

FIGURE 7:
Percent of Mothers Who Reported Smoking During Pregnancy by Race, Shelby County & Tennessee, 2001-2010

Source: Tennessee Department of Health, Office of Policy, Planning and Assessment, Division of Health Statistics, Birth Record Data 2001-2010



Smoking during pregnancy remains low in Shelby County.

Prenatal smoking is associated with health problems such as pregnancy complications, premature birth, low-birth-weight, stillbirth and sudden infant death syndrome (SIDS).[23] In Tennessee, the infant mortality rate among mothers who smoked during pregnancy is higher than that of non-smoking mothers (13.4 vs. 7.7 per 1,000 births).[3,22]

Women who quit smoking before or during pregnancy can substantially reduce or eliminate risks to themselves and their infants. Although 93 percent of Shelby County mothers abstain from smoking during pregnancy, this figure still falls short of the Healthy People 2020 Goal of 98.6 percent.

2010 data show that prenatal smoking continues to be less common in Shelby County than across Tennessee (FIGURE 7):

- Statewide, the percentage of mothers who smoked during pregnancy (17.6%) was over twice the percentage for Shelby County (7.0%).
- The trend in prenatal smoking among Shelby County mothers has remained relatively stable around 7 percent in recent years.
- Smoking during pregnancy is consistently higher among white mothers than black mothers in Shelby County.

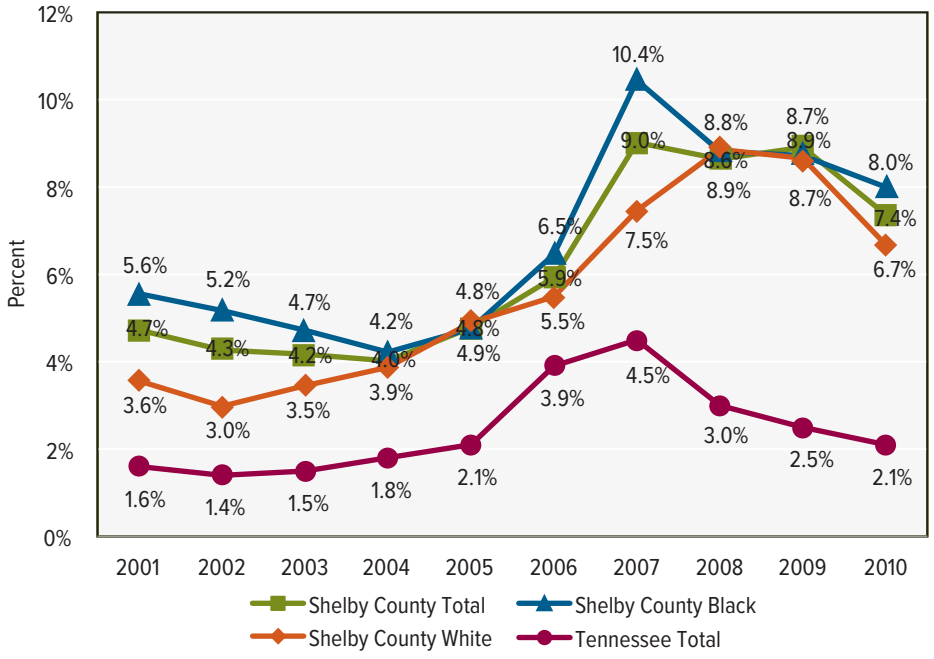


Figure 8:
Percent of Mothers Who Report Having Received No Prenatal Care, Shelby County & Tennessee, 2001-2010

Source: Tennessee Department of Health, Office of Policy, Planning and Assessment, Division of Health Statistics, Birth Record Data 2001-2010

The percentage of mothers receiving no prenatal care has decreased.

Timely prenatal care is important for the health of mothers and their babies, and may contribute to a reduction in infant mortality and low-birthweight.[24] Prenatal care should begin in the first trimester, and for a full-term pregnancy should include 10 to 14 visits.[25]

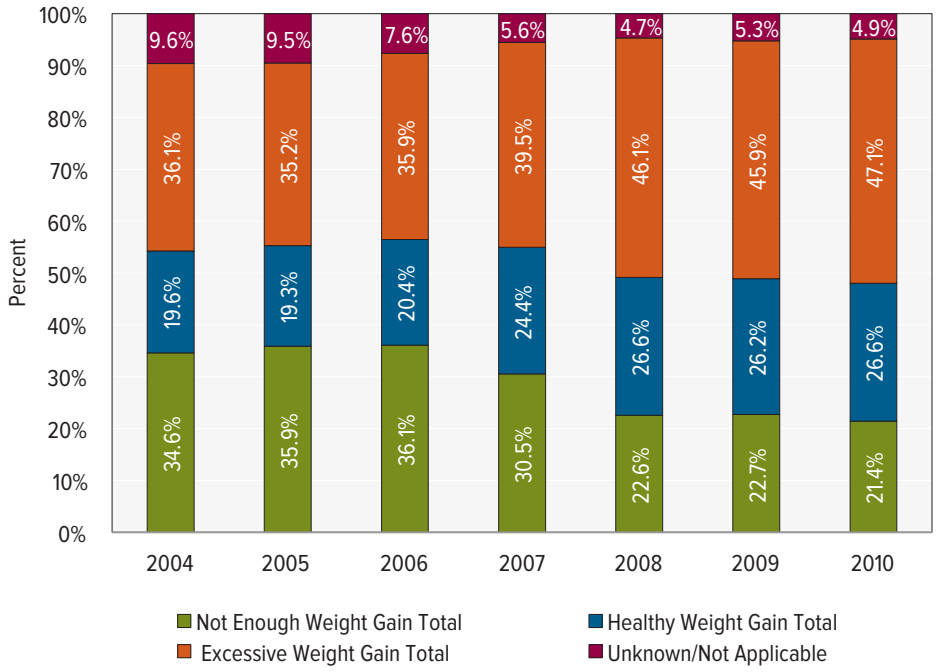
Unfortunately, there are often socio-demographic barriers to accessing prenatal care, including poverty, minority status, age less than 18 years, non-English speaking, being unmarried and having less than a high school education.[26]

FIGURE 8 presents yearly percentages of Shelby County and Tennessee mothers who reported not receiving any prenatal care:

- In 2010, 7.4 percent of Shelby County mothers had no prenatal care.
- The percentage more than doubled during the period between 2004 and 2007 (4.0% to 9.0%).
- Current figures have decreased since their 2007 peak, but are still higher than the 2004 percentage.
- As in past years, the 2010 percentage of women not receiving prenatal care is higher in Shelby County than across the state (7.4% vs. 2.1%).

FIGURE 9: Percent of Mothers by Pregnancy Weight Gain Status, Shelby County, 2001-2010

Source: Tennessee Department of Health, Office of Policy, Planning & Assessment. Division of Health Statistics, Birth Record Data 2001-2010



Excessive weight gain during pregnancy is increasing in Shelby County.

Obesity among American women of childbearing age has more than doubled since the 1970's. Excessive weight gain during pregnancy is a health risk, especially for a mother who was already overweight.[27-29]

Excess weight gain has been linked to labor and delivery complications, preterm birth, and infant mortality.[30] It can also result in high infant birthweight, which increases a child's risk of diabetes, cardiovascular disease, and later obesity.[31]

FIGURE 9 shows patterns of pregnancy weight gain among Shelby County mothers (based on Institute of Medicine recommendations[28]):

- In 2010, 47.1 percent of pregnant mothers experienced excessive weight. This figure has followed an upward trend since 2004.
- 21.4 percent did not gain enough weight, consistent with the overall decline since 2004.
- 26.6 percent had healthy weight gain, continuing an upward trend since 2004.

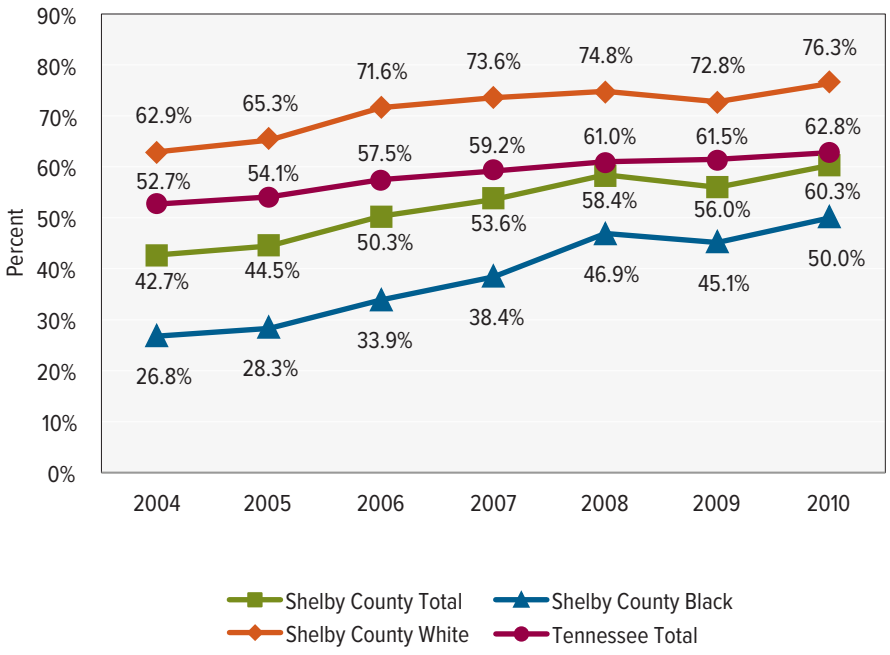


Figure 10: Percent of Mothers Who Initiate Breastfeeding, Shelby County & Tennessee, 2004-2010

Source: Tennessee Department of Health, Office of Policy, Planning & Assessment. Division of Health Statistics, Birth Record Data 2004-2010

Initiation of breastfeeding among mothers is increasing.

Breast milk is the most appropriate source of nutrition for infants, and it provides vital health benefits to both the infant and mother. The American Academy of Pediatrics (AAP) recommends exclusive breastfeeding during a baby's first six months and continued breastfeeding for at least the first year.

Infants who are not breastfed are more likely to suffer poor health outcomes, including infections, asthma, diabetes, obesity, leukemia and sudden infant death syndrome. Benefits for mothers include reduced risk of breast cancer, ovarian cancer, diabetes and postpartum depression.[32-34]

National survey data shows that 75 percent of new mothers initiate breastfeeding, but only 43 percent are still breastfeeding 6 months later. At 12 months, only 22 percent are. Only 13 percent of new mothers follow the AAP recommendation that babies younger than 6 months receive only breast milk. These figures are even lower for Tennessee.[35]

Breastfeeding statistics for Shelby County are collected from birth certificate forms, which include information on whether new mothers have begun breastfeeding by the time they leave the hospital.[36] The available data indicates that breastfeeding is increasing among Shelby County mothers (FIGURE 10):

- In 2010, 60.3 percent of mothers were breastfeeding at the time of discharge, an increase of 41 percent since 2004.
- In 2010, 62.8 percent of Tennessee mothers had begun breastfeeding when they left the hospital.
- Although breastfeeding at discharge is higher among white mothers, it has increased by 87 percent since 2004 among black mothers.

References

1. Annie E. Casey Foundation. *2011 Kids Count Data Book*. Available at: http://datacenter.kidscount.org. Accessed March 20, 2012.

2. U.S. Department of Health and Human Services. *Healthy People 2020 Objectives*. Available at: http://www.healthypeople.gov/2020. Accessed March 20, 2012.

3. Bauer AM, Li Y, Law DJ. *Infant Mortality in Tennessee, 1997-2006*. Tennessee Department of Health Office of Policy, Planning and Assessment.

4. U.S. Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau. *Child Health USA 2011*. Available at: http://mchb.hrsa.gov/chusa11/hstat/hsi/pages/203pb.html. Accessed March 20, 2012.

5. Stevens LM, Lynm C, Richard G. Low Birth Weight. *JAMA*. 2009; 287(2).

6. Resnick MB, Gueorguieva RV, Carter RL, et al. The Impact of Low Birth Weight, Perinatal Conditions, and Sociodemographic Factors on Educational Outcomes in Kindergarten. *Pediatrics*. 1999; 104 (6).

7. Martin JA, Hamilton BE, Sutton PD, et al. Births: Final Data for 2006. *Natl Vital Stat Rep*. 2009; 57(7). Hyattsville, MD: National Center for Health Statistics, Centers for Disease Control and Prevention.

8. Central Intelligence Agency. Country comparisons: infant mortality rate. *The World Factbook*. Available at: https://cia.gov/library/publications/the-world-factbook/rankorder/2091rank.html. Accessed March 20, 2012.

9. Osypuk TL, Acevedo-Garcia D. Are Racial Disparities in Preterm Birth Larger in Hypersegregated Areas? *Am. J. Epidemiol.* 2008; 167 (11): 1295-1304.

10. Kramer MR, Hogue CR. What Causes Racial Disparities in Very Preterm Birth? A Biosocial Perspective. *Epidemiol Rev*. 2009; 31 (1): 84-98.

11. Fiscella K. Racial disparities in preterm births. The role of urogenital infections. *Public Health Rep*.1996; 111(2):104-13.

12. Tennessee Department of Health. *Infant Mortality Statistics*. Available at: http://health.state.tn.us/infantmortality/stats_facts.htm. Accessed on March 20, 2012.

13. Perper K, Peterson K, Manlove J. Diploma Attainment Among Teen Mothers. Child Trends, Fact Sheet Publication #2010-01: Washington, DC: *Child Trends*; 2010. Available at: http://www.childtrends.org/Files/Child_Trends-2010_01_22_FS_DiplomaAttainment.pdf. Accessed March 20, 2012.

14. Hoffman SD. Kids Having Kids: Economic Costs and Social Consequences of Teen Pregnancy. Washington, DC: The Urban Institute Press; 2008. Available at: http://www.urban.org/publications/901199.html. Accessed March 20, 2012.

15. U.S. Department of Health and Human Services, Office of Adolescent Health. *Reproductive Health*. Available at: http://www.hhs.gov/ash/oah/adolescent-health-topics/reproductive-health/home.html#_ftn10. Accessed April 11, 2012.

16. Centers for Disease Control and Prevention. *About Teen Pregnancy*. Available at: http://www.cdc.gov/TeenPregnancy/AboutTeenPreg.htm. Accessed April 11, 2012.

17. Centers for Disease Control and Prevention. *1991-2009 High School Youth Risk Behavior Survey Data*. Available at http://apps.nccd.cdc.gov/youthonline. Accessed on March 20, 2012.

18. Ventura SJ, Bachrach CA. Nonmarital childbearing in the United States, 1940–99. *Natl Vital Stat Rep*. 2000; 48 (16). Hyattsville, M D: National Center for Health Statistics.

19. Mathews TJ, MacDorman MF. Infant mortality statistics from the 2005 period linked birth/infant death data set. *Natl Vital Stat Rep*. 2008; 57(2). Hyattsville, MD: National Center for Health Statistics.

20. McLanahan S. *The consequences of nonmarital childbearing for women, children, and society. Report to Congress on Out-of-Wedlock Childbearing*; 1995. Hyattsville, MD: National Center for Health Statistics.

21. Carlson MJ, Corcoran ME. Family structure and children's behavioral and cognitive outcomes. *Journal of Marriage and Family*. 2001;63(3):779-792.

22. US Department of Health and Human Services. *Women and smoking: a report of the Surgeon General*. 2001. Washington, DC: Office of the Surgeon General.

23. Centers for Disease Control and Prevention. *Smoking During Pregnancy*. Available at: http://www.cdc.gov/tobacco/basic_information/health_effects/pregnancy/. Accessed March 29, 2012.

24. Singh, GP, Kogan MD. Persistent socioeconomic disparities in infant, neonatal, and postneonatal mortality rates in the U.S., 1969-2001. *Pediatrics*. 2007;119:928-939.

25. Gibson J, Lyttle E. *Mothers and Babies: The Health of Tennessee's Future*. Report No. R-04-06. Tennessee Comptroller of the Treasury. 2006. Available at: http://www.comptroller1.state.tn.us/ repository/RE/infant_mortality.pdf Accessed April 29, 2011.

26. Kiely JL, Kogan MD. *Prenatal Care*. Centers for Disease Control and Prevention: Public Health Surveillance for Women, Infants and Children. Available at: http://www.cdc.gov/reproductivehealth/ProductsPubs/DatatoAction/pdf/rhow8.pdf. Accessed March 20, 2012.

27. Institute of Medicine (US) and National Research Council (US) Committee to Reexamine IOM Pregnancy Weight Guidelines; Rasmussen KM, Yaktine AL, editors. *Weight Gain During Pregnancy: Reexamining the Guidelines*. Washington (DC): National Academies Press (US); 2009. Descriptive Epidemiology and Trends.

28. Institute of Medicine (US) and National Research Council (US) Committee to Reexamine IOM Pregnancy Weight Guidelines. Report Brief: *Weight Gain During Pregnancy: Reexamining the Guidelines*. Washington (DC): National Academies Press (US); 2009. Available at: http://www.iom.edu/Reports/2009/Weight-Gain-During-Pregnancy-Reexamining-the-Guidelines.aspx. Accessed March 20, 2012.

29. Whitaker RC. Predicting preschooler obesity at birth: the role of maternal obesity in early pregnancy. *Pediatrics*. 2004;114:29-36.

30. Howie LD, Parker JD, Schoendorf KC. Excessive maternal weight gain patterns in adolescents. *Journal of the American Dietetic Association*. 2003;103(12):1653-1657.

31. Hutcheon JA, Platt RW, Meltzer SJ, et al. Is birth weight modified during pregnancy? *American Journal of Obstetrics and Gynecology*. 2006;195:488-494.

32. Gartner LM, Morton J, Lawrence RA, et al. Breastfeeding and the use of human milk. *Pediatrics* 2005;115:496-506.

33. U.S. Department of Health and Human Services. *The Surgeon General's Call to Action to Support Breastfeeding*. Washington, DC: U.S. Department of Health and Human Services, Office of the Surgeon General; 2011.

34. U.S. Department of Health and Human Services, Office on Women's Health. *Frequently asked questions – Breastfeeding*. Available at: http://www.womenshealth.gov/publications/our-publications/fact-sheet/Breastfeeding.pdf. Accessed April 11, 2012.

35. Centers for Disease Control and Prevention. *Breastfeeding Among U.S. Children Born 2000—2008, CDC National Immunization Survey*. Available at: http://www.cdc.gov/breastfeeding/data/NIS_data/index.htm. Accessed April 11, 2012.

36. Centers for Disease Control and Prevention. *National Birth Certificate Data*. Available at: http://www.cdc.gov/breastfeeding/data/. Accessed March 29, 2012.

A child's early home environment has long-term effects on development.

A child's early home environment has a profound effect on his well-being. Beginning in infancy, a problematic home environment can disrupt the brain's stress response system, reduce the quality of caregiving a child receives, and interfere with healthy development.[1]

Research has linked negative home environments during children's first three years with a host of developmental problems, including

- poorer language development by age three.
- later behavior problems.
- deficits in school readiness.
- aggression, anxiety and depression.
- impaired cognitive development at age three.[2-4]

Longer-term effects have also been documented: A child's early home environment and the skills he learns in the first three years have been linked to

- high school graduation.
- teen parenthood.
- adult employment and earnings.[5,6]

The home environment can even affect a child's brain development.

Brain imaging research suggests that growing up in a disadvantaged environment causes the brain to develop differently.[7] For example, living in an environment affected by chaos and poverty can lead to changes in the brain's stress system that increase a child's vulnerability to chronic diseases later in life.[8]

Studies of very young children have identified distinctive patterns of brain activity associated with family income and socioeconomic status, especially in brain areas related to social and emotional development, language ability, and learning and memory.[9-11]

What is a risk factor ?

A risk factor is a condition that is statistically associated with a given outcome. For example, children who grow up poor are more likely than other children to drop out of high school. Poverty, then, is a risk factor for high school dropout. Not all poor children will drop out of high school, of course. They are said to be at risk because as a group they have a higher incidence of dropout.

Research has identified specific aspects of a child's environment that are associated with later outcomes. Commonly studied risk factors include poverty/income, maternal depression, and low maternal education. They are strong predictors of later outcomes including academic performance, cognitive development, and social and emotional well-being.[12-14]

Risk factors like these can affect children even in the first years of life. Early risk is associated with later behavioral and academic outcomes. For example, risk exposure during infancy appears to be more detrimental for children's school readiness than later exposure.[13,14]

The CANDLE Study provides valuable data about our community's children.

The Conditions Affecting Neurocognitive Development and Learning in Early Childhood (CANDLE) is an ongoing study of approximately 1,500 Shelby County women and their young children. Mothers enroll in their 2nd trimester and participate until their children are three years old. The CANDLE study collects information on numerous aspects of development, including health, nutrition, cognition functioning, and psychosocial well-being.

Overall, CANDLE participants are similar to Shelby County mothers as a whole, increasing the likelihood that trends seen among the CANDLE group can be generalized to expectant mothers throughout Shelby County. This chapter uses CANDLE data to examine the presence of three well-known risk factors—low-income, low maternal education, and maternal depression—among our community's young children.[15]

Family income and economic well-being are important predictors of children's well-being.

Family income and economic circumstances have a powerful effect on children's development. Like other risk factors, low family income affects children mainly by affecting their home environments and the parenting they receive in ways that hinder optimal development.[3,16]

Income-related differences in parenting appear early. For instance, lower-income mothers are, on average, less affectionate, less responsive to their infants' distress signals, and more likely to have harsh parenting styles.[17,18]

In poor and low-income families, the home environment is more likely to be chaotic, and parents are more likely to be stressed and unresponsive. They show less sensitivity and provide less cognitive stimulation.[2,13,19] Research shows that lower-income mothers talk less and spend less time in shared activities with their children than do middle-income mothers, and are less engaged when their children talk to them.[20]

Poor children have fewer stimulating experiences and learning materials than higher-income children.[14,21] The effects are apparent in the first years and often last into adulthood. Low-income children, even in the first three years of life, are more likely to have lower cognitive scores and increased behavioral problems.[19]

55.3 percent of families participating in the CANDLE study have annual incomes below $25,000. (The Federal Poverty Level for a family of four is $22,050).[22]

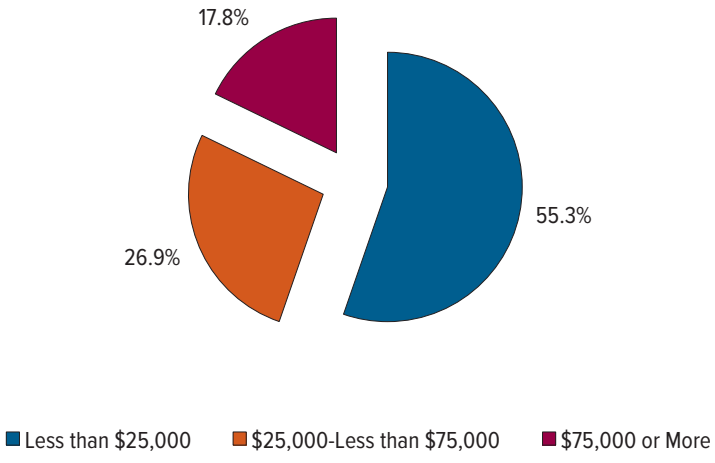


FIGURE 1:
Percent of CANDLE Families by Annual Income.

Source: Shih R, Chandra A, Griffin BA, et al. Birth outcomes in the Conditions Affecting Neurocognitive Development and Learning in Early Childhood (CANDLE) Study. 2012. (Pending publication).

Better-educated parents tend provide more positive home environments.

Like family income, parental education is a strong influence on children's home environments. In some research on child outcomes, maternal education is a better predictor than family income.[23]

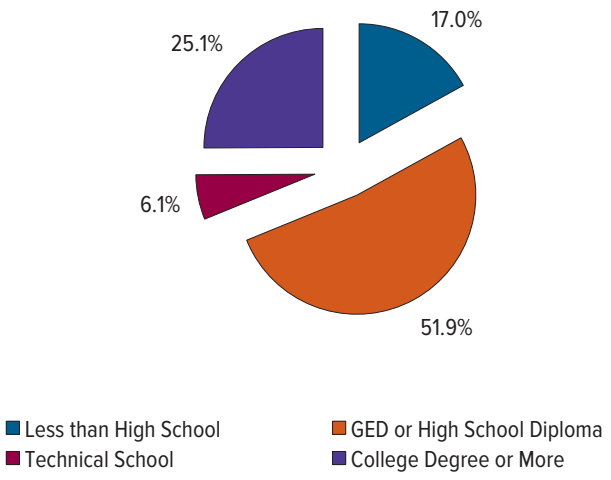
In a brain imaging study of young children, there were measurable effects of maternal education on brain regions involved in attention skills.[23] In another study, parental educational level was related to children's educational and occupational success at age 48.[25]

Among mothers of infants and toddlers, increases in education have been shown to promote improvements in young children's home environments and language development. Parents' education appears to be especially beneficial for children of poor, young, or single-mothers.[15,26]

17 percent of CANDLE mothers have less than a high school education. 25 percent have a Bachelor's Degree or higher.[22]

FIGURE 2: Percent of CANDLE Mothers by Educational Attainment.

Source: Shih R, Chandra A, Griffin BA, et al. Birth outcomes in the Conditions Affecting Neurocognitive Development and Learning in Early Childhood (CANDLE) Study. 2012. (Pending publication).



Maternal depression is a grave threat to children's healthy development.

Maternal postpartum depression is the most common medical complication of childbearing. Although most women experience some brief depression-like symptoms in the first week or two after giving birth, national research shows that 10 to 15 percent of new mothers are afflicted by major depression—often lasting six months or longer.[27-29]

Common symptoms of postnatal depression include sleep disturbances, feelings of guilt, and loss of interest in daily activities. Not surprisingly, then, new mothers who suffer from untreated depression are unlikely to be able to provide the positive experiences their infants need.

On average, depressed mothers spend less time touching and talking to their babies, and their interactions tend to be more negative. Studies repeatedly show that depression is associated with parenting styles that are either understimulating or overstimulating.[27,28]

If left untreated, maternal depression in a child's first years can have negative effects on cognitive development, behavior, and school readiness.[30] There appear to be biological effects as well: recent research has discovered distinct patterns of brain activity and stress hormone levels in children of depressed mothers.[27]

Mothers in the CANDLE study complete a brief assessment to screen for possible depression at 4 weeks after birth and again at 12 months. While not an actual diagnosis, an At Risk score indicates that a mother is likely to be suffering from postpartum depression and that further assessment is recommended.

At 4 weeks, 11.2 percent of all mothers scored At Risk. At 12 months, 10.7 percent scored At Risk.[22]

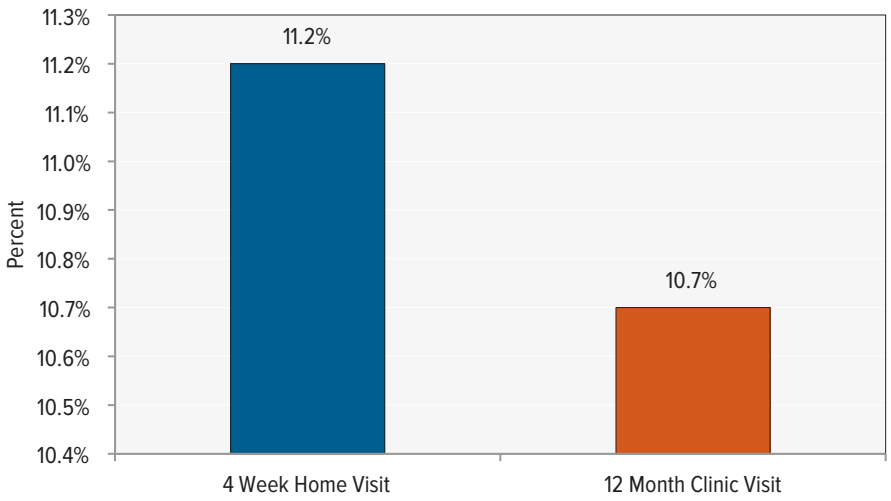


FIGURE 3: Percent of CANDLE Mothers at Risk for Depression, 4 Weeks & 12 Months.

Source: Tylavsky F, Atkins JK, Atkins R, Bush A, et al. Conditions Affecting Neurocognitive Development and Learning in Early Childhood. 2012. Unpublished raw data.

The CANDLE data show that many of our community's families with young children are at risk.

Because CANDLE participants, as a group, are roughly representative of the local population, we can reasonably assume that similar patterns would be found among expectant mothers throughout Memphis and Shelby County.[15]

Although these preliminary findings do not allow us to make specific projections or draw hard conclusions, it is clear that economic hardship, low educational attainment, and maternal depression are a widespread threat to our children's healthy development.

The importance of children's early environments means that reducing and eliminating later gaps in achievement must begin early in life. Effective interventions need to start long before children reach kindergarten—the earlier, the better.

Policy efforts to reduce economic hardship, promote education among parents of young children, and improve the identification and treatment of depression among new mothers are promising strategies for improving children's early home environments.

References

1. Blair C, Granger DA, Willoughby M, et al. Salivary cortisol mediates effects of poverty and parenting on executive functions in early childhood. *Child Development*. 2011; 82(6):1970-8.

2. Evans GW, Ricciuti HN, Hope S, et al. Crowding and cognitive development. The mediating role of maternal responsiveness among 36-month-old children. *Environment and Behavior*. 2010; 42(1): 135-148.

3. Trentacosta CJ, Hyde, LW, Shaw DS, et al. The relations among cumulative risk, parenting, and behavior problems during early childhood. *Journal of Child Psychology and Psychiatry*. 2008; 49: 1211-1219.

4. Vernon-Feagans L, Garrett-Peters P, Willoughby M, et al. Chaos, poverty, and parenting: Predictors of early language development. *Early Childhood Research Quarterly*. 2011 (in press).

5. Duncan GJ, Ziol-Guest KM, Kalil A. Early childhood poverty and adult attainment, behavior, and health. *Child Development*. 2010; 81: 306–325.

6. Pungello EP, Kainz K, Burchinal M, et al. Early educational intervention, early cumulative risk, and the early home environment as predictors of young adult outcomes within a high-risk sample. *Child Development*. 2010; 81: 410-426.

7. Gianaros PJ. Socioeconomic health disparities: A health neuroscience and lifecourse perspective. *Psychological Science Agenda*. 2011; 25(1).

8. Miller GE, Chen E, Fok AK, et al. Low early-life social class leaves a biological residue manifested by decreased glucocorticoid and increased proinflammatory signaling. *Proceedings of the National Academy of Sciences USA*. 2009; 106: 14716-14721.

9. Hanson JL, Chandra A, Wolfe BL, et al. Association between income and the hippocampus. *PLoS ONE*. 2011; 6(5): e18712.

10. Noble KG, Houston SM, Kan E, et al. Neural correlates of socioeconomic status in the developing human brain. *Developmental Science*. 2012; in press, 1–12.

11. Raizada RD, Richards TL, Meltzoff A, et al. Socioeconomic status predicts hemispheric specialisation of the left inferior frontal gyrus in young children. *NeuroImage*. 2008; 40(3): 1392–1401.

12. Burchinal M, Roberts JE, Zeisel SA, et al. Social risk and protective child, parenting, and child care factors in early elementary school years. *Parenting: Science and Practice*. 2006; 6(1): 79-113.

13. Mistry RS, et al. Family and social risk, and parental investments during the early childhood years as predictors of low-income children's school readiness outcomes. *Early Childhood Research Quarterly*. 2010; 25: 432–449.

14. Sektan M, McClelland MM, Acock A, et al. Relations between early family risk, children's behavioural regulation, and academic achievement. *Early Child Research Quarterly*. 2010; 25: 464-479.

15. Shih R, Chandra A, Griffin BA, et al. *Birth outcomes in the Conditions Affecting Neurocognitive Development and Learning in Early Childhood* (CANDLE) Study. 2012 (Pending publication).

16. Lanza ST, et al. Modeling multiple risks during infancy to predict quality of the caregiving environment: contributions of a person-centered approach. *Infant Behavior & Development*. 2011; 34: 390-406.

17. Fouts HN, Roopnarine JL, Lamb ME. Social experiences and daily routines of African American infants in different socioeconomic contexts. *Journal of Family Psychology*. 2007; 21: 655-664.

18. Kim HK, Pears KC, Fisher PA, et al. Trajectories of maternal harsh parenting in the first 3 years of life. *Child Abuse & Neglect*. 2010; 34(12): 897-906.

19. Berger LM, Paxson C, Waldfogel J. Income and child development. *Children and Youth Services Review*. 2009; 31: 978–989.

20. Huttenlocher J, Vasilyeava M, Waterfall HR, et al. The varieties of speech to young children. *Developmental Psychology*. 2007; 43(5): 1062-1083.

21. Yeung WJ, Pfeiffer KM. The black–white test score gap and early home environment. *Social Science Research*. 2009; 38: 412-437.

22. Tylavsky F, Atkins JK, Atkins R, Bush A, et al. *Conditions Affecting Neurocognitive Development and Learning in Early Childhood*. 2012. Unpublished raw data.

23. Son S, Morrison F. The nature and impact of changes in home learning environment on development of language and academic skills in preschool children. *Developmental Psychology*. 2010; 46(5):1103–1118.

24. Stevens C, Lauinger B, Neville H. Differences in the neural mechanisms of selective attention in children from different socioeconomic backgrounds: An event-related brain potential study. *Developmental Science*. 2009; 12(4): 634–646.

25. Dubow EF, Boxer P, Huesmann LR. Long-term effects of parents' education on children's educational and occupational success. *Merrill-Palmer Quarterly*. 2009; 55(3): 224-249.

26. Magnuson KA, Sexton HR, Davis-Kean PE, et al. Increases in maternal education and young children's language skills. *Merrill-Palmer Quarterly*. 2009; 55 (3): 319-350.

27. Field, T, Hernandez-Reif M, Diego M. Intrusive and withdrawn depressed mothers and their infants. *Developmental Review*. 2006; 26: 15–30.

28. Parsons CE, Young KS, Murray L, et al. The functional neuroanatomy of the evolving parent–infant relationship. *Progress in Neurobiology*. 2010; 91: 220–241.

29. Sit DK, Wisner KL. The identification of postpartum depression. *Clinical Obstetrics and Gynecology*. 2009; 52(3): 456–468.

30. Logsdon MC, Wisner KL, Pinto-Foltz MD. The impact of postpartum depression on mothering. *Journal of Obstetric Gynecological and Neonatal Nursing*. 2006; 35: 652-658.

Educating our kids in order to break the cycle of poverty

Children are expected to arrive at kindergarten able to sit still and pay attention during class time, resolve conflicts with their classmates, and follow simple directions. They have an advantage if they are familiar with basic language and vocabulary, if they enjoy hearing stories and being read to, and if they have some knowledge about letters and numbers. These basic skills allow them to participate effectively and increase the likelihood that they will thrive in school and beyond.[1,2]

Children in poverty are less likely than middle-class children to develop these skills before kindergarten.[3,4] Too often, poor children have fewer early learning experiences[5,6] than their better-off peers. For example, poor and low-income children tend to live in homes with fewer books and less language stimulation.[7]

As a result, they are likely to fall behind when school begins.[3,5,8-10] Some research indicates that poor and low-income children arrive at kindergarten already a full year behind other children on cognitive measures.[11] These differences in kindergarten readiness translate into later academic struggles, high school dropout, adult difficulties finding work, and poorer health.[12-19]

Breaking this cycle of poverty in Memphis requires investing in our youngest children and ensuring that they have nurturing and enriching early experiences, including high-quality early care and educational opportunities. The earliest years of life are a period of rapid brain development. Young children's brains are creating the vital early connections that form the basis of learning how to use language and numbers, how to control their emotions, and how to get along with others—the essential ingredients of school readiness.[20]

For children to arrive at kindergarten well prepared, they need parents and educators in their lives who support their early learning. Preschool and home learning help prepare children for kindergarten, regardless of their background.

Education starts in the home.

Children are born learning! Preparing for school starts in the first days of life by nourishing a child's natural curiosity. In optimal home learning environments, parents develop strong bonds with their children, engage in educational activities with them, and provide books and other learning materials.[21,22]

Young children who grow up in high-quality learning environments are better able to develop emerging cognitive skills, such as early literacy and numeracy skills.[23-25] These early skills, in turn, are connected to better reading and math skills in elementary school.[24,26,27]

Since language development and reading are fundamental to all areas of learning, one of the most important things parents can do with their children is read to them regularly.[5] Introducing children to books and reading fosters their ability to learn more easily in formal school settings.[28] When it comes to reading with young children, more is better. Reading at least once each a week promotes early reading achievement.[29] Most experts recommend that parents read to children daily!

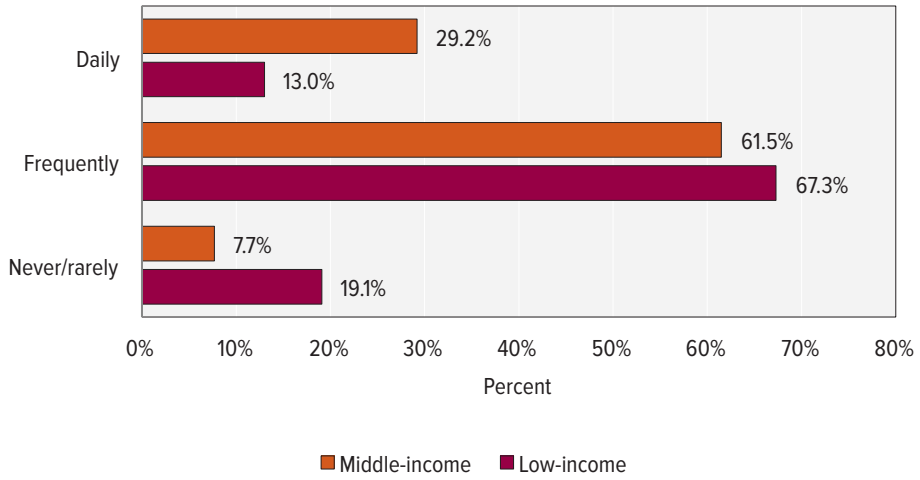
Middle-income parents read to their children more often than low-income parents.

In the 2010 Census, 53 percent of parents nationwide reported reading to their toddlers at least seven times a week and 49 percent reported reading to their preschoolers seven or more times each week. Among low-income families, these numbers drop to 45 and 40 percent, respectively.[30] Young children in Memphis are read to less than national averages.

At the beginning of the 2011-2012 school year, 389 parents of kindergarten students at five Memphis City Schools (MCS) were asked about their families' early childhood reading practices. The good news is that about two-thirds reported reading to their children several times each week. At the same time, only 29 percent of middle-income parents and 13 percent of low-income parents reported reading to their children daily. Alarmingly, 19 percent of low-income parents reported that they never or rarely read to their children (FIGURE 1).

FIGURE 1: How Often Does Someone in Your Home Read a Young Children's Book With Your Child?

Source: Memphis City Schools (MCS), Office of Research & Evaluation, Pre-K data, 2011-2012



Frequently: 1-2 times a week or almost daily
Never/rarely: Never or 1-2 times a month

Middle-income parents are more comfortable reading to their children than low-income parents.

Why might so few parents in Memphis read to their children daily? While chaotic and stressful lives can sometimes get in the way of reading with young children, parents' own reading abilities could be another influence. According to Literacy Mid-South, over 120,000 adults in Memphis cannot read or write.[31] However, most parents of new kindergarteners reported that they enjoy reading to their children.

As FIGURE 2 shows, middle-income parents were more comfortable reading than low-income parents.

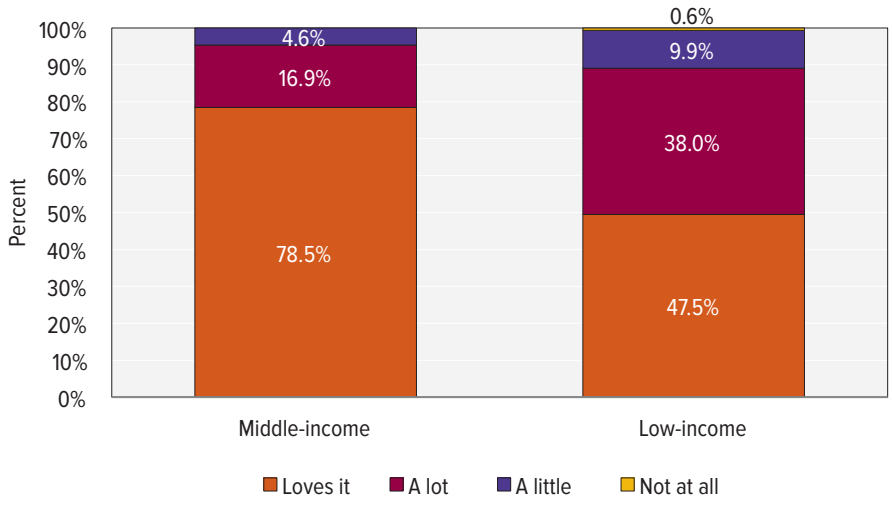


FIGURE 2:
How Comfortable Are You Reading to Your Child?

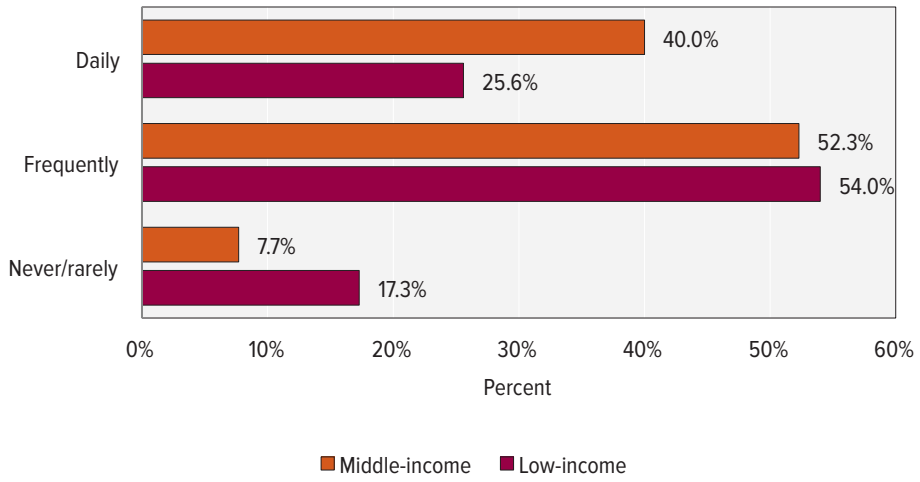
Source: Memphis City Schools (MCS), Office of Research & Evaluation, Pre-K data, 2011-2012

Middle-income children show more interest in reading than low-income children.

Similar patterns of reading behavior were found when parents reported how often their kindergarten children asked to be read to or looked at books alone. Among middle-income children, 40 percent asked someone to read to them each day, whereas only a 26 percent of low-income children did so (FIGURE 3). Just over 46 percent of middle-income children and 38 percent of low-income children looked at books by themselves daily (FIGURE 4).

FIGURE 3: How Often Does Your Child Ask to be Read To?

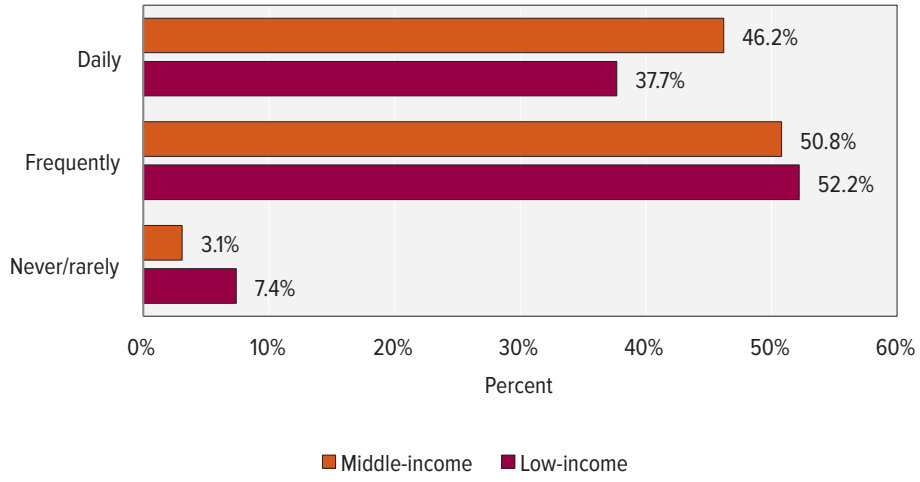
Source: Memphis City Schools (MCS), Office of Research & Evaluation, Pre-K data, 2011-2012



Frequently: 1-2 times a week or almost daily
Never/rarely: Never or 1-2 times a month

FIGURE 4: How Often Does Your Child Look at Books by Him/ Herself?

Source: Memphis City Schools (MCS), Office of Research & Evaluation, Pre-K data, 2011-2012



Frequently: 1-2 times a week or almost daily
Never/rarely: Never or 1-2 times a month

Middle-income parents believe their children like being read to more than low-income parents.

We also see a strong income-based difference in the degree to which parents believe their children enjoy reading. 92 percent of middle-income parents believe their children really enjoy reading, compared to only 76 percent of low-income parents (FIGURE 5).

Although many children in our community are developing a healthy interest in reading and books, the evidence indicates that there are income differences in attitudes toward reading. Low-income kindergarteners and their parents were less likely to read than their middle-income counterparts.

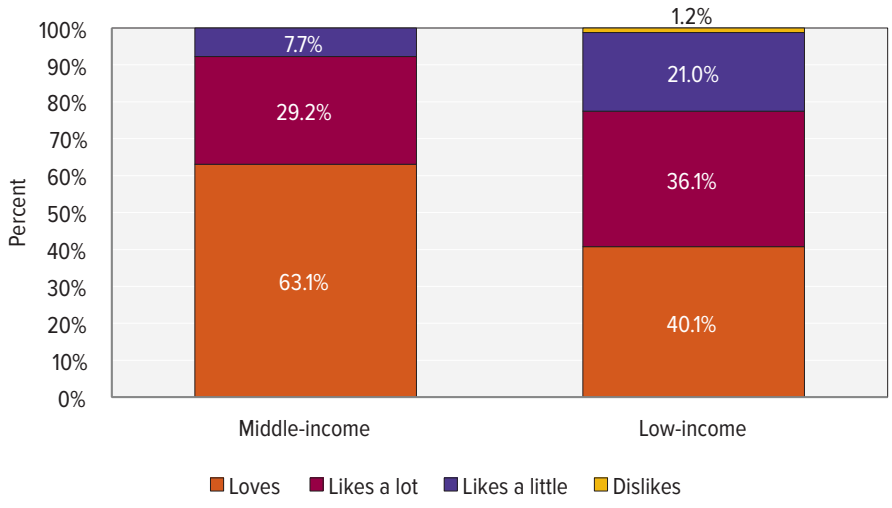


FIGURE 5:
How Much Does Your Child Like Being Read To?

Source: Memphis City Schools (MCS), Office of Research & Evaluation, Pre-K data, 2011-2012

"It takes a village to raise a child."

Parents' early reading and teaching practices help children develop the skills needed to succeed in school. But parents cannot do it by themselves. In Memphis, many families struggle to provide for their children. Poverty, low levels of social support, and high levels of parental stress place these children at risk for behavioral problems and reduced cognitive outcomes.[32]

Participating in pre-kindergarten (Pre-K) and other high-quality early education and childcare (Head Start, for example) can help parents provide important educational experiences for young children. Research has demonstrated that these programs not only prepare children for kindergarten, but also set them on a path to continued success in school and reduce their risk of negative outcomes.[33,34] In Memphis, children who attend MCS Pre-K, Head Start, or another structured child care center arrive at kindergarten more ready than children who spent the year before kindergarten at home with a relative.[35]

Over the last six years Memphis City Schools has responded to these needs by more than doubling the number of Pre-K slots – from 1,800 in 2005 to over 4,100 today (including 1,400 combined MCS Pre-K and Head Start slots).

Still, there are more eligible children than available slots. Because of this discrepancy, students who are at greatest risk for academic challenges are given top priority for enrollment. MCS determines this risk through developmental screening and assessment of family risk factors. Extensive research on early childhood development has identified many risk factors associated with reaching kindergarten unprepared.[4,36-38]

These risk factors include:

- Growing up in a family that struggles financially
- Teenage motherhood
- Parents with less than a high school education
- Having only one parent at home
- Difficulty with language

Most children who apply for MCS Pre-K have 1 or 2 family risk factors.

Among the 3,644 families who applied for MCS Pre-K the 2011-2012 school year, only 14 percent had none of these family risk factors, while 71 percent of families had 1 or 2 risk factors (FIGURE 6). Despite these struggles, these parents took an important step to help their children succeed by signing them up for Pre-K.

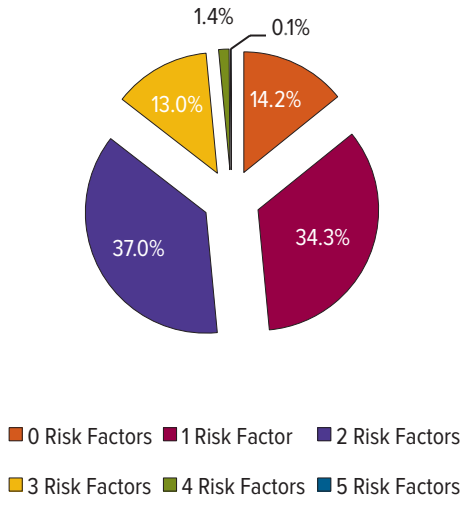


FIGURE 6:
Percent of Children by Number of Family Risk Factors

Source: Memphis City Schools (MCS), Office of Research & Evaluation, Pre-K data, 2011-2012

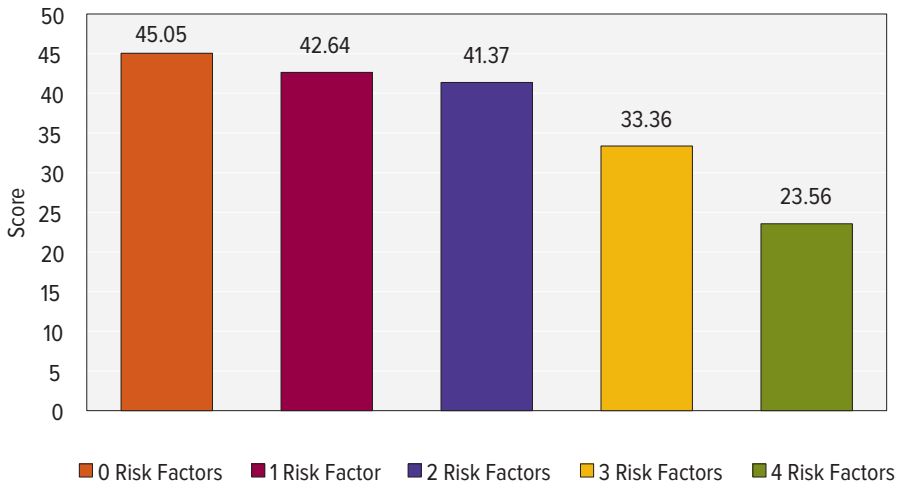
Children with fewer family risks perform better on developmental assessments.

In addition to assessing family risk among children applying for Pre-K, MCS also screens for developmental delays using the Brigance Screening II, a valid and reliable measure of skills in four key areas—physical motor development, social-emotional development, language development, and acquired knowledge.[39,40]

Brigance scores range from 0 to100 points,[39] but on average these children scored below 50 even if they had no family risk factors. (FIGURE 7) Furthermore, scores tended to be lower for children with more family risk factors. (Since only three children had all 5 family risk factors, they were not included in this analysis.)

FIGURE 7: Brigance Screening Score by Number of Family Risk Factors

Source: Memphis City Schools (MCS), Office of Research & Evaluation, Pre-K data, 2011-2012



Clearly, children whose families applied for MCS Pre-K have great potential to benefit from the quality educational experiences offered. Moreover, those who could not be offered a spot in a MCS Pre-K (due to limited capacity) will likely arrive at kindergarten less prepared to succeed unless they find other high-quality services.

While there are other high-quality options for preschool experiences, there are not enough slots available for all children. Shelby County currently only offers some combination of Head Start or Pre-K to 7,400 children each year, which is roughly half of the estimated 14,000 3- and 4-year-olds in Shelby County living in poverty.

There are other childcare and early education programs in Shelby County, but availability, location, and cost of high-quality programs are often barriers to low-income families and their children.[32] Overall, our community has seen an increase in the availability of quality early educational care. However, many young children are still left unserved and more efforts at multiple levels are needed to break the cycle of poverty through early education.

References

1. Reynolds AJ, Ou SR. Alterable predictors of child wellbeing in the Chicago longitudinal study. *Children and Youth Services Review*. 2004; 26: 1–14.

2. Duncan GJ, Dowsett CJ, Claessens A. School readiness and later achievement. *Developmental Psychology*. 2007; 43(6): 1428-1446.

3. Hart B, Risley TR. *Meaningful differences in the everyday experience of young American children*. Baltimore, MD: Paul H. Brookes Publishing Co; 1995.

4. Lee VE, Burkam DT. *Inequality at the Starting Gate: Social Background Differences in Achievement as Children Begin School*. Washington, DC: Economic Policy Institute; 2002.

5. Snow CE, Burns MS, Griffin P. (Eds.). *Preventing Reading Difficulties in Young Children*. Washington, DC: National Academy Press; 1998.

6. Serpell R, Sonnenschein S, Baker L, Ganapathy H. Intimate cultures of families in early socialization of literacy. *Journal of Family Psychology*. 2002; 16(4): 391-405.

7. Hoff E. The specificity of environmental influence: socioeconomic status affects early vocabulary development via maternal speech. *Child Development*. 2003; 74(5): 1368-1378.

8. Zimmerman FJ, Gilkerson J, Richards JA, Christakis DA, Xu D, Gray S, Yapanel U. Teaching by listening: The importance of adult-child conversations to language development. *Pediatrics*. 2009; 124: 342-249.

9. Willms, D. (2007). *Wait to Fail*. Presentation to the Canadian Education Association.

10. Sell M, Imig, D. *Understanding the Relationship Between Family Income and School Readiness in Memphis;* 2011, February 18. Available at: http://www.theurbanchildinstitute.org/sites/all/files/2011-02_School_Readiness.pdf. Accessed on February 1, 2012.

11. Stipek DJ, Ryan RH. Economically disadvantaged preschoolers: Ready to learn but further to go. *Developmental Psychology*. 1997; 33(4): 711-723.

12. Adler NE, Boyce T, Chesney MA, Cohen S, Folkman S, Kahn RL, et al. Socioeconomic status and health: The challenge of gradient. *American Psychologist*. 1994; 49: 15-24.

13. Cowell, AJ. The relationship between education and health behavior: Some empirical evidence. *Health Economics*. 2006; 15(2): 125-146.

14. Duncan, Greg., Kathleen Ziol-Guest, and Kalil A. Early-Childhood Poverty and Adult Attainment, Behavior, and Health. *Child Development*. 2010; 81(1): 306-325.

15. Elo IT. Preston SH. Educational differentials in mortality: United States, 1979-85. *Social Science & Medicine*. 1996; 42(1), 47-57.

16. Lodi-Smith J, Jackson J, Bogg T, Walton K, Wood D, Harms P, Roberts B.W. Mechanisms of health: Education and health-related behaviours partially mediate the relationship between conscientiousness and self-reported physical health. *Pyschology & Health*. 2010; 25(3): 305-319.

17. Nocon M, Keil T, Willich SN. Education, income, occupational status and health risk behavior. *Journal of Public Health*. 2007; 15: 401–405.

18. Yeung WJ, Linver MR, Brooks-Gunn J. How money matters for young children's development: parental investment and family processes. *Child Development*. 2002; 73(6): 1861-1879.

19. The Urban Child Institute. *Strengthen Shelby County by Investing in Early Childhood*. 2012. Available at: http://www.theurbanchildinstitute.org/articles/research-to-policy/policy/strengthen-shelby-county-by-investing-in-early-childhood. Accessed on: March 20, 2012.

20. Perry BD, Pollard RA, Blakley TL, Vigilante D. Childhood trauma, the neurobiology of adaptation & "use-dependent" development of the brain: how states become traits. *Infant Mental Health Journal*. 1996; 16(4): 271-291.

21. Zero to Three. *Getting Ready for School Begins At Birth;* 2011. Available at: http://www.zerotothree.org/child-development/social-emotional-development/gettingreadyforschool beginsatbirth.pdf. Accessed on March 20, 2012.

22. Bradley RH, Caldwell BM. Caregiving and the regulation of child growth and development: Describing proximal aspects of caregiving systems. *Developmental Review*. 1995; 15: 38–85.

23. Collins WA, Maccoby EE, Steinberg L, Hetheringotn EM, Bornstein MH. Contemporary research on parenting: The case for nature and nurture. *American Psychologist*; 2000; 55: 218–232.

24. Morrison, F. J., & Cooney, R. R. Parenting and Academic Achievement: Multiple Paths to Early Literacy. In J. G. Borkowski, S. L. Ramey, & M. Bristol-Power (Eds.), *Parenting and the Child's World: Influences on Academic, Intellectual, and Socioemotional Development* Mahwah, NJ: Erlbaum. 2001; 141-160.

25. Son S, Morrison FJ. The nature and impact of changes in home learning environment on development of language and academic skills in preschool children. Home Learning Environment on Development of Language and Academic Skills in Preschool *Children Developmental Psychology*. 2010, 46(5): 1103–1118.

26. Griffin EA, Morrison FJ. The unique contribution of home literacy environment to differences in early literacy skills. *Early Child Development and Care*. 1997; 127: 233–243.

27. Melhuish, E. C., Phan, M. B., Sylva, K., Sammons, P., Siraj-Blatchford, I., & Taggart, B. Effects of the Home Learning Environment and Preschool Center Experience Upon Literacy and Numeracy Development in Early Primary School. *Journal of Social Issues*. 2008;(64): 95–114.

28. Raikes H, Pan BA, Luze G, Tamis-LeMonda ST, Brooks-Gunn J, Constantine J, et al. Mother-child book reading in low-income families: Correlates and outcomes during the first three years of life. *Child Development*. 2006; 77: 803–1128.

29. Paratore JR. Approaches to family literacy: Exploring the possibilities. *The Reading Teacher*. 2005; 59: 394-396.

30. United States Census Bureau. Reading to children by any family Member-characteristics of families and households with children age 1 to 5. *A Child's Day: 2009*; 2011. Available at: http://www.census.gov/hhes/socdemo/children/data/sipp/well2009/tables.html. Accessed on March 20, 2012.

31. Hartman, A. *Literacy Mid-South Helping Memphians Read*. WMCTV. 2012. Available at http://www.wmctv.com/story/16358079/literacy-mid-south-helping-memphians-read. Accessed on April 12, 2012.

32. The Urban Child Institute. *The State Of Children in Memphis and Shelby County: Data Book (5th ed.)*; 2010. Available at: http://www.theurbanchildinstitute.org/sites/all/files/databooks/TUCI_Data_Book_V_2010.complete.pdf. Accessed on March 20, 2012.

33. Gormley W, Gayer T, Phillips D, Dawson B. *The Effects of Oklahoma's Universal Pre-Kindergarten Program on School Readiness*. New York, NY: The Center for Research on Children in the U.S., Georgetown University, 2004.

34. Sammons, P., Elliot, K., Sylva, K., Melhuish, M., Siraj-Blatchford, & Taggart, B. The Impact of Pre-school on Young Children's Cognitive Attainments at Entry to Reception. *British Education Research Journal*. 2004; 30(5): 691-712.

35. Sell M. *The Effects of Pre-K Experience on "Kindergarten Readiness Indicator" Scores: 4-year Trends*, Memphis, TN: Memphis City Schools; 2009. Available at: http://www.mcsk12.net/docs/Data/PreK/Effects%20of%20Pre-K%20Experience%20on%20KRI%20Scores%20-%204%20Year%20Trends.pdf. Accessed on: March 20, 2012.

36. Magnuson K, Duncan G. The role of family socioeconomic resources in racial test score gaps. *Developmental Review*. 2006; 26: 365-399.

37. Magnuson K, Meyers M, Ruhm C, Waldfogel J. Inequality in Preschool Education and School Readiness. *American Educational Research Journal*. 2004; 41: 115-157.

38. The Urban Child Institute. *Research to Policy January 2011: The Implications of Teen Parenting for Early Childhood Development in Memphis*. 2011. Available at: http://www.theurbanchildinstitute.org/articles/research-to-policy/overviews/the-implications-of-teen-parenting-for-early-childhood. Accessed on April 13, 2012.

39. Brigance, A.H. *Brigance Preschool Screen-II*. North Billerica, MA: Curriculum Associates, Inc. 2005.

40. Glascoe, F.P. *Technical Report for the Brigance Screens*. North Billerica, MA: Curriculum Associates, Inc. 2005.

Special Topic: Shelby County *Books from Birth* Program

In Shelby County, many children start life at a disadvantage, making effective early intervention particularly important. Programs that set young children on a pathway to school readiness and academic success help to build an educated, productive future for our community.

Reading is a fundamental tool for learning, and acquiring an early love for reading increases the chances that children will become proficient readers later.[1,2] Children whose parents read to them learn to take pleasure in books. They tend to develop richer vocabularies, arrive at kindergarten prepared to succeed, and read at grade level. They are also more likely to succeed in later grades, to graduate from high school on time, and to attend college.[3-5]

Research shows key differences in early home reading practices between low- and middle-income families. Low-income parents are less likely to read with children, and their children are less likely to enjoy reading.[6,7] Poor children also have less access to children's books.[8,9] Children's early access to books is a key factor in promoting kindergarten readiness and later academic success.[10]

Books from Birth: Spreading children's books across Shelby County.

Increasing young children's access to books is precisely the mission of the Shelby County *Books from Birth* (*BfB*) program, which delivers an age-appropriate book each month for the first five years of a child's life. By increasing access to books, the *BfB* program aims to build a culture of early reading, promote stronger family connections, and help prepare all Shelby County children for kindergarten. The program is free, and all Shelby County children under age five are eligible.[11]

Shelby County's *BfB* program is the largest affiliate of Dolly Parton's *Imagination Library (IL)*. The IL program was founded in 1995 in an effort to inspire an early love of reading and ensure all children have their own home libraries. Each year, a committee of early childhood education experts chooses developmentally appropriate and high-quality books to be delivered by the program.[12]

Shelby County's *BfB* program was started in 2005, with the help of the Governor's *Books from Birth* Foundation, which matches funds raised by the Shelby County program.[13] The result is an inexpensive early educational intervention targeting the needs of children in Shelby County.

Currently, the *BfB* program reaches almost half of all children from birth to age five in Shelby County,[14] and another 34,000 children have graduated from the program. As FIGURE 1 shows, the program has reached children in every part of the county: every zip code has at least 30 percent of children under five enrolled in the program.

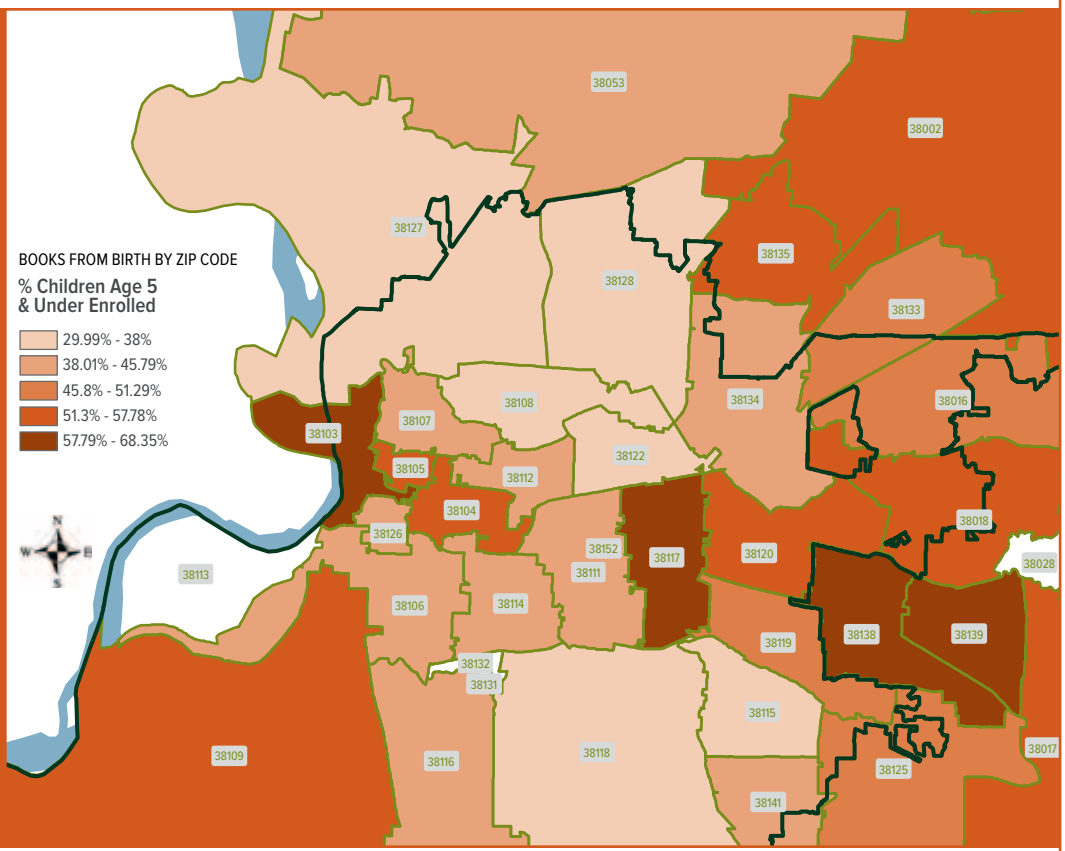


FIGURE 1: *Books from Birth* Reaches Children in Every Part of Shelby County

Source: Shelby County Books from Birth, Zip Code Report, February 2012

Is *Books from Birth* more than just a good idea?

A number of studies have asked parents in the program about the changes they see in their family's reading habits. Consistently, parents indicate that as a result of the program:

- They spent more time reading with children.
- Their comfort reading to children improved.
- Their children's interest in books increased.[15,16]

These trends are particularly evident for low-income families and families enrolled in the program longer.[17,18] Additionally, kindergarten teachers report that *BfB* children are better prepared when they reach school than non-participants.[19,20]

Until recently, however, no evaluation had compared reading patterns in participating families to those of similar families who did not participate in the program. Also lacking was a rigorous assessment of the program's effect on kindergarten readiness, particularly for low-income children.

Over the past year, Memphis City Schools, The Urban Child Institute, and Shelby County *Books from Birth* collaborated on a study designed to evaluate the effects of the *BfB* program. The evaluation addressed two main questions:

1. Do *BfB* families engage in better early reading habits than families who don't receive the books?
2. Do children in the *BfB* program have higher kindergarten readiness scores than other children after we take into account other factors like family income and pre-school experiences?

To answer these questions, information was collected on 389 children entering kindergarten in five Memphis City School (MCS) elementary schools at the beginning of the 2011-2012 school year. This information included

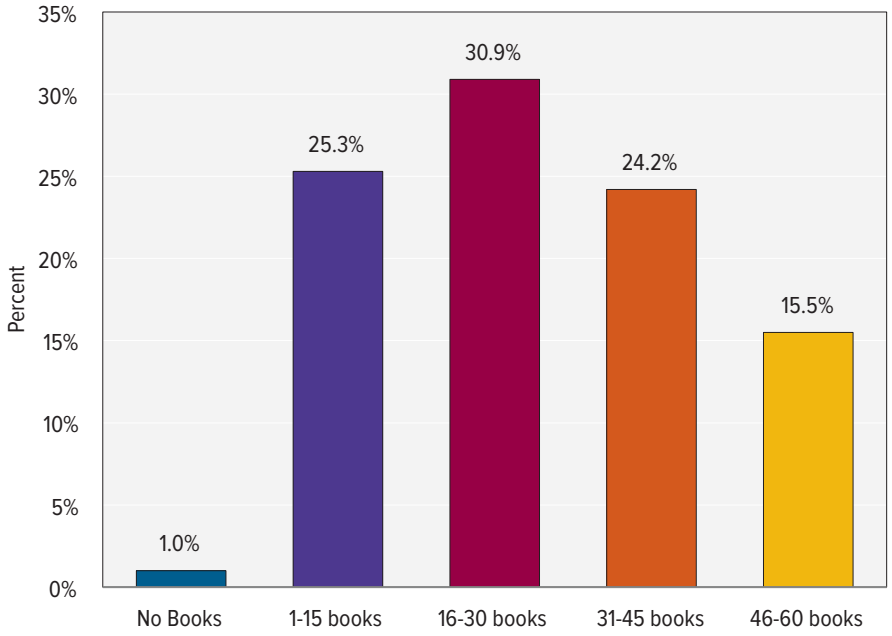
- Early home reading practices
- *Books from Birth* participation
- Children's preschool experiences
- Family income
- School readiness measures

Most *Books from Birth* participants received more than 15 *Imagination Library* Books.

Findings from the investigation show that the *BfB* program reached half of the new kindergartners in these schools. Both low-income and middle-income families took advantage of the program: 50 percent of low-income children and 60 percent of middle-income children were *BfB* participants. Most participating children received more than 15 *IL* books prior to entering kindergarten with as many as 15 percent of children receiving most of the 60 *IL* books (shown in FIGURE 2).

FIGURE 2: How Many Books Has Your Child Received from *Imagination Library*?

Source: Donahue S., Samiei, SA, Sell, M, Imig, D, & Bush, AJ. Books from Birth Participation is Associated with Better Family Reading Habits and Predicts School Readiness. Unpublished manuscript.



Books from Birth participants had more children's books in their homes than non-participants.

The evaluation also indicates that *BfB* is a major source of children's books in Shelby County. Participants had substantially more children's books at home than non-participants. (See FIGURE 3.) This finding is important because studies show that children who have more books tend to have better academic outcomes.[21,22] The current evaluation suggests that children with 26 or more books scored 15 points higher on the school readiness language scale than the district average.

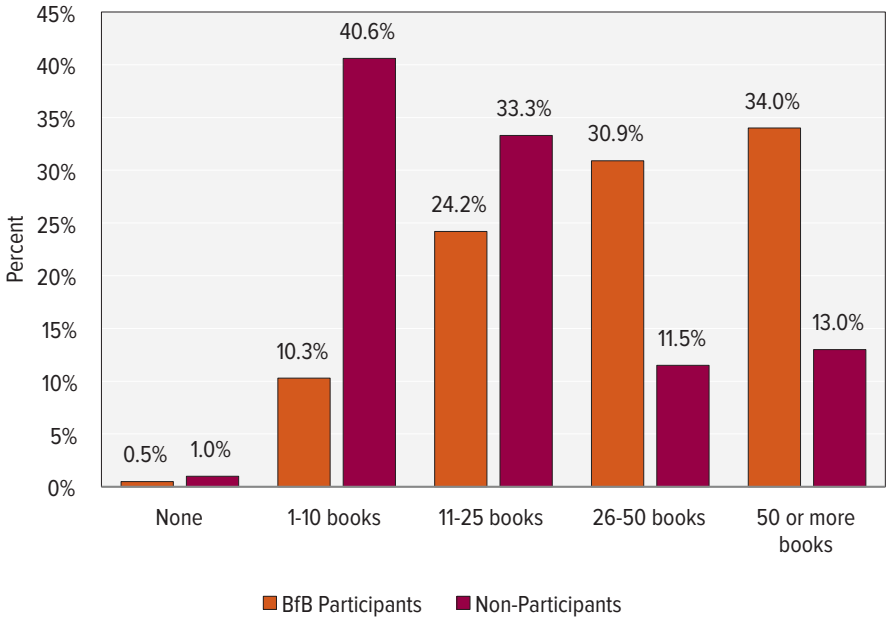


FIGURE 3:
How Many Young Children's Books Do You Have in Your Home?

Source:
Donahue S., Samiei, SA, Sell, M, Imig, D, & Bush, AJ. Books from Birth Participation is Associated with Better Family Reading Habits and Predicts School Readiness. Unpublished manuscript.

BfB families also reported stronger home reading habits than non-participating families. Parents were more likely to read with children, go to the library, talk about books, and sing the alphabet with their children. *BfB* parents were also more likely to be comfortable reading with their children and their children are more likely to enjoy shared reading.

Consistent with earlier findings, receipt of more *IL* books was associated with stronger program effects. Families that received 46-60 *IL* books had significantly higher family reading habit scores than families that received 1-15 *IL* books.

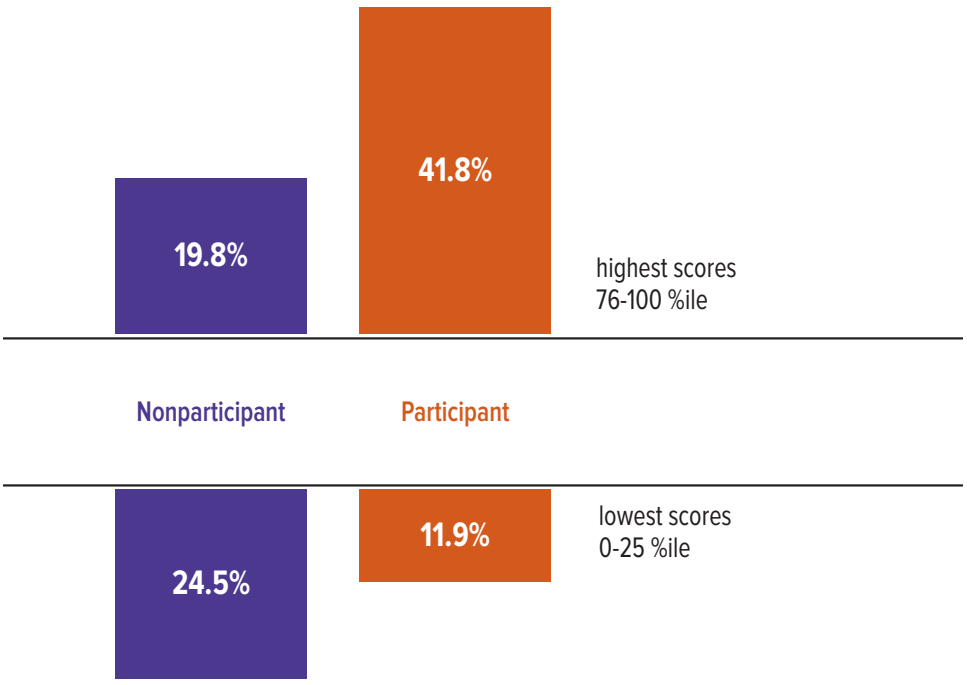
Books from Birth participants are better prepared for Kindergarten.

In addition to assessing family reading habits, this evaluation compared school readiness of children who participated in the program to children who did not. Previous research shows that kindergarten readiness predicts later academic success and well-being.

MCS teachers administer the Kindergarten Readiness Indicator (KRI) on the first day of school. The KRI was developed by the MCS to determine children's early math and language skills quickly and efficiently.[23] FIGURE 4 presents the distribution of KRI language readiness scores of *BfB* participants and non-participants. *BfB* participants were almost four times more likely to score in the highest quartile on the school readiness language scale than the lowest quartile, while non-participants were equally likely to fall into the highest and lowest quartile.

FIGURE 4: Kindergarten Readiness Indicator Language Scores by *Books from Birth* Participation

Source: Donahue S., Samiei, SA, Sell, M, Imig, D, & Bush, AJ. Books from Birth Participation is Associated with Better Family Reading Habits and Predicts School Readiness. Unpublished manuscript



Regardless of family income, children benefit from *Books from Birth*.

The *BfB* program seems to be beneficial for children regardless of family income. Overall, children in middle-income families were less likely to have low school readiness scores. However, within each income group, *BfB* participants had stronger scores than non-participants. As FIGURE 5 indicates, both the average KRI language score, and the distribution of scores around the mean were stronger for the group of *BfB* children.

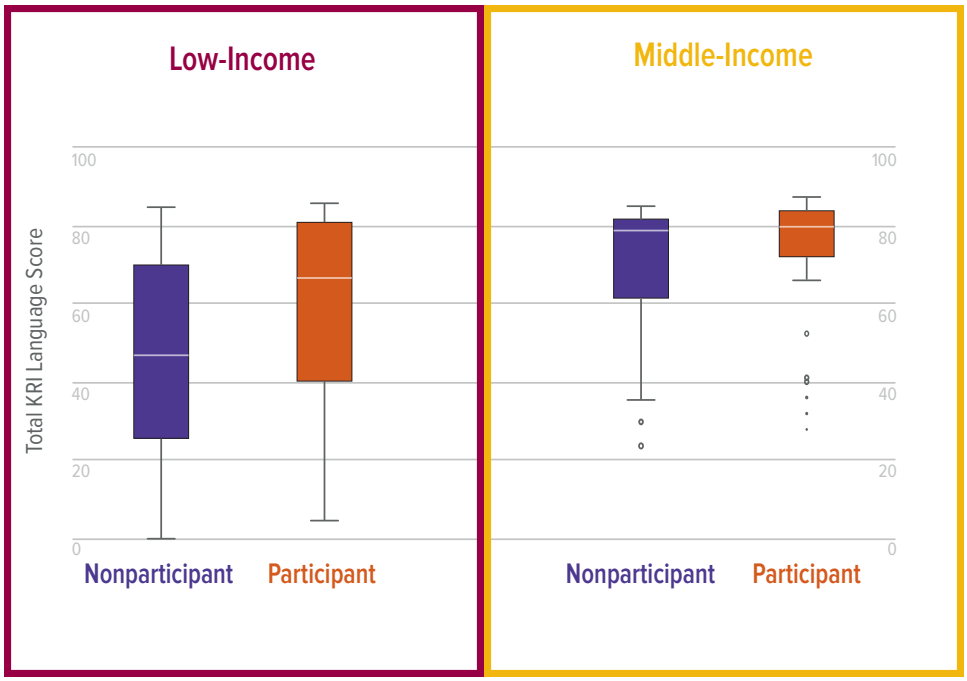


FIGURE 5: Kindergarten Readiness Indicator Language Scores by *Books from Birth* Participation & Income

Source: Donahue S., Samiei, SA, Sell, M, Imig, D, & Bush, AJ. Books from Birth Participation is Associated with Better Family Reading Habits and Predicts School Readiness. Unpublished manuscript.

Shelby County's *Books from Birth* program is associated with better family reading habits and higher school readiness scores.

In fact, participating in the *BfB* program statistically predicted better school readiness language scores, even after accounting for other factors, including families' reading habits, child's age at kindergarten entry, preschool experience, and family income. After accounting for each of these factors, a child in the program is likely to score 8 points higher on the KRI language measure. (*BfB* participation was also associated with stronger math readiness scores, but the results were not statistically significant after accounting for other factors.)

Numerous studies have followed large cohorts of children into adulthood. These studies indicate that maintaining a culture of reading at home is associated with improved school readiness and better educational outcomes. These home characteristics are even more crucial for fragile families.[24-26]

Armed with an understanding of how to strengthen their children's early reading skills, parents can build home literacy environments that promote school readiness and academic success.[27,28] The *Books from Birth* program is an effective early intervention program that provides families with valuable reading materials, fostering a culture of early reading and making a difference in the lives of Shelby County's youngest children.

References

1. Snow CE, Burns MS, Griffin P. (Eds.). *Preventing Reading Difficulties in Young Children*. Washington, DC: National Academy Press; 1998.

2. Serpell R, Sonnenschein S, Baker L, Ganapathy H. Intimate cultures of families in early socialization of literacy. *Journal of Family Psychology*. 2002; 16(4): 391-405.

3. Justice LM, Kaderavek JN. Emedded-explicit emergent literacy intervention: Background and description approach. *Language, Speech, and Hearing Services in Schools*. 2004; 35: 201-211.

4. Lee VE, Burkam DT. *Inequality at the Starting Gate: Social Background Differences in Achievement as Children Begin School*. Washington, D.C.: Economic Policy Institute; 2002.

5. Sadowski M. The School Readiness Gap: Prekindergarten—not just preschool—may be the key to narrowing disparities in achievement by race, ethnicity, and income. *Harvard Education Letter*. 2006; 22(4): 1-4.

6. Serpell R, Sonnenschein S, Baker L, Ganapathy H. Intimate cultures of families in early socialization of literacy. *Journal of Family Psychology*. 2002; 16(4): 391-405.

7. McQuillan J. The Literary Crisis: False Claims, Real Solutions. Portsmouth, NH: Heinemann; 1998.

8. Lee VE, Burkam DT. *Inequality at the Starting Gate: Social Background Differences in Achievement as Children Begin School*. Washington, D.C.: Economic Policy Institute; 2002.

9. Neuman S, Dickinson, D. (Eds.). *Handbook of Early Literacy Research* (Vol. 2). The Guilford Press; 2006.

10. Neuman S. *Changing the Odds for Children at Risk: Seven Essential Principles of Educational Programs that Break the Cycle of Poverty*. Praeger Publishers; 2009.

11. Shelby County Books from Birth. *Help Us Build a Community of Readers*; 2012. Available at: http://booksfrombirth.org/. Accessed April 3, 2012.

12. Shelby County Books from Birth. *Help Us Build a Community of Readers*; 2012. Available at: http://booksfrombirth.org/. Accessed April 3, 2012.

13. Shelby County Books from Birth. *Help Us Build a Community of Readers*; 2012. Available at: http://booksfrombirth.org/. Accessed April 3, 2012.

14. U.S. Census Bureau. *State & County Quickfacts: Shelby County, TN*; 2012, January 17. Available at :http://quickfacts.census.gov. Accessed February 28, 2012.

15. Gordon, T. D. (2010). *Celebrating little dreamers: An analysis of the first 18 months of Dolly Parton's Imagination Library in Middletown, Ohio*. Middletown, OH: Imagination Library Middletown. Retrieved from: http://www.mcfoundation.org/report.pdf

16. High/Scope Educational Research. *Literacy outcomes and the household literacy environment: An evaluation of the Dolly Parton's Imagination Library*. Ypsilanti, MI: High/Scope Educational Research Foundation Research Department; 2003, November 26.

17. Thomason GB. *The impact of the Ferst Foundation for Childhood Literacy on the home literacy environment*. (Unpublished doctoral disseration). Liberty University, Lynchburg, VA; 2008.

18. Ridzi F, Sylvia MR, Singh S. Imagination Library: Do More Books in Hand Mean More Shared Book Reading? *Le Moyne College Center for Urban and Regional Applied Research Working Paper*; 2011, June 5.

19. Governer's Books from Birth Foundation. *Tennessee's Imagination Library improves school preparedness*. Available at: http://uwcentralcoast.org/PDF/BooksFromBirthResearch.pdf; 2008. Accessed November 1, 2010.

20. Tennessee Board of Regents. *Imagination Library Program fall 2007 survey of pre-kindergarten teachers: Report of findings;* 2008, January. Available at: http://www.governorsfoundation.org/pdf/PreKindergartenResultsFall07final.pdf. Accessed November 1, 2010.

21. Sanders LM, Zacur G, Haecker T, Klass P. Number of children's books in the home: an indicator of parent health literacy. *Ambulatory Pediatrics*. 2004; 4(5):424-8.

22. Evans MDR, Kelley J, Sikora J, Treiman DJ. Family scholarly culture and educational success: Books and schooling in 27 nations. *Research in Social Stratification and Mobility;* 2010, in press. Available at: http://www.rodneytrice.com/sfbb/articles/home.pdf

23. Sell MA. *Kindergarten Readiness Indicator: Instrument scoring and validation technical report*. Memphis, TN: Memphis City Schools; 2008.

24. Golova, N., Alario, A., Viver, P., Rodriguez, M. & High, P. Literacy promotion for Hispanic families in a primary care setting: A randomized, controlled trial. *Pediatrics*. 1999; 5: 993–997.

25. Mendelsohn AL, Mogilner, LN, Dreyer BP, Forman JA, Weinstein SC, Broderick M, Cheng KJ, Magloire T, Moore T, & Napier C. The Impact of a Clinic-Based Literacy Intervention On Language Development in Inner-City Preschool Children. *Pediatrics*. 2001; 107(1): 130-134.

26. Monique Senechal M, LeFevre J. Parental involvement in the development of children's reading skill: A five-year longitudinal study. *Child Development*. 2002; 73(2): 445-460.

27. Debaryshe BD, Binder JC, Buell MJ. Mothers' implicit theories of early literacy instruction: Implications for children's reading and writing. *Early Child Development and Care*. 2000; 160: 119-131.

28. Reese E, Cox A. Quality of adult book reading affects children's emergent literacy. *Developmental Psychology*. 1999; 35(1): 20-28.

Community

It's no surprise that parents' income matters for their children's development. It takes money to provide for a child's needs. Even when a family has enough to cover basic necessities like food and shelter, they may struggle to make ends meet and find it difficult to purchase resources like quality child care and learning materials that can give children a strong start in life.

What is often overlooked, however, is that the neighborhood where a child lives can have effects over and above parental income and other family-level influences. In other words, neighborhoods matter—even for children in families with adequate incomes and positive home environments. Crime, widespread unemployment, social isolation, and lack of community resources create unhealthy environments for children's development.[1]

This chapter takes a look at the most recent available data on community-level factors that have been shown to affect children's chances for later achievement and success.

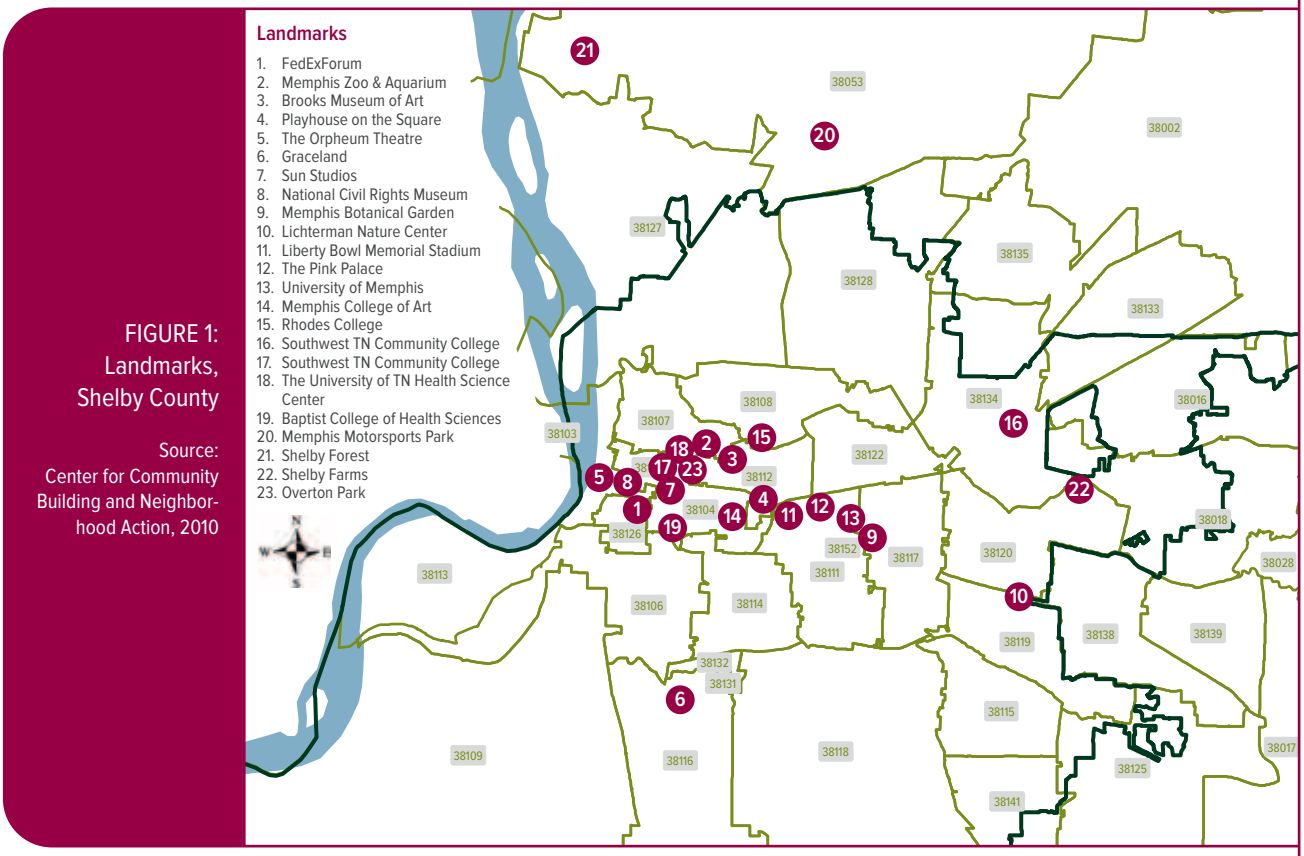


FIGURE 1: Landmarks, Shelby County

Source: Center for Community Building and Neighborhood Action, 2010

Most of the data is presented at the census-tract level. To ensure readability, we have not labeled census tracts in the following maps. Instead, we include zip code labels to provide a context for the tract-level statistics. We have also provided a map of well-known landmarks (FIGURE 1) to help readers orient themselves.

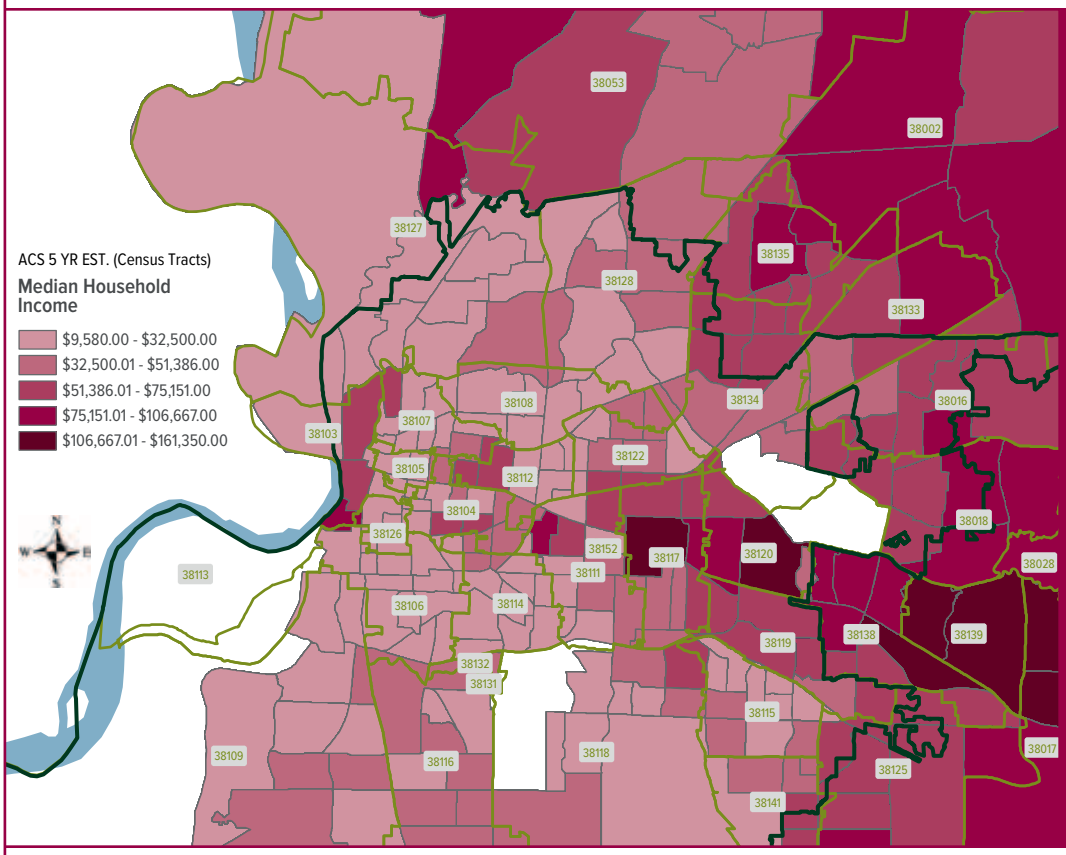


FIGURE 2: Median Household Income, Shelby County

Source: US Census Bureau, American Community Survey 5 Year Estimates, 2006-2010

Neighborhood income has been linked to children's outcomes.

Research consistently links family income to child well-being. The effects of income begin early: by age three, lower-income children tend to have lower cognitive scores and more behavioral problems.[2]

Living in a low-income neighborhood can have effects that are independent of family income. In areas of concentrated disadvantage, children are likely to face multiple risk factors that threaten their educational, emotional, and social outcomes.[3,4]

FIGURE 2 depicts the median household incomes for Census Tracts in Shelby County.

- Census Tract 114 (in Zip Code 38107) has the lowest median household income in Shelby County ($9,580).
- Census Tract 213.53 (in 38139) has the highest median income in the county ($161,350).
- The highest median income in Memphis is in Census Tract 213.11 (38120) with $124,531.
- 91 out of 221 Census Tracts in Shelby County have a median household income of $32,500 or less.

Neighborhood poverty and economic hardship threaten children's healthy development.

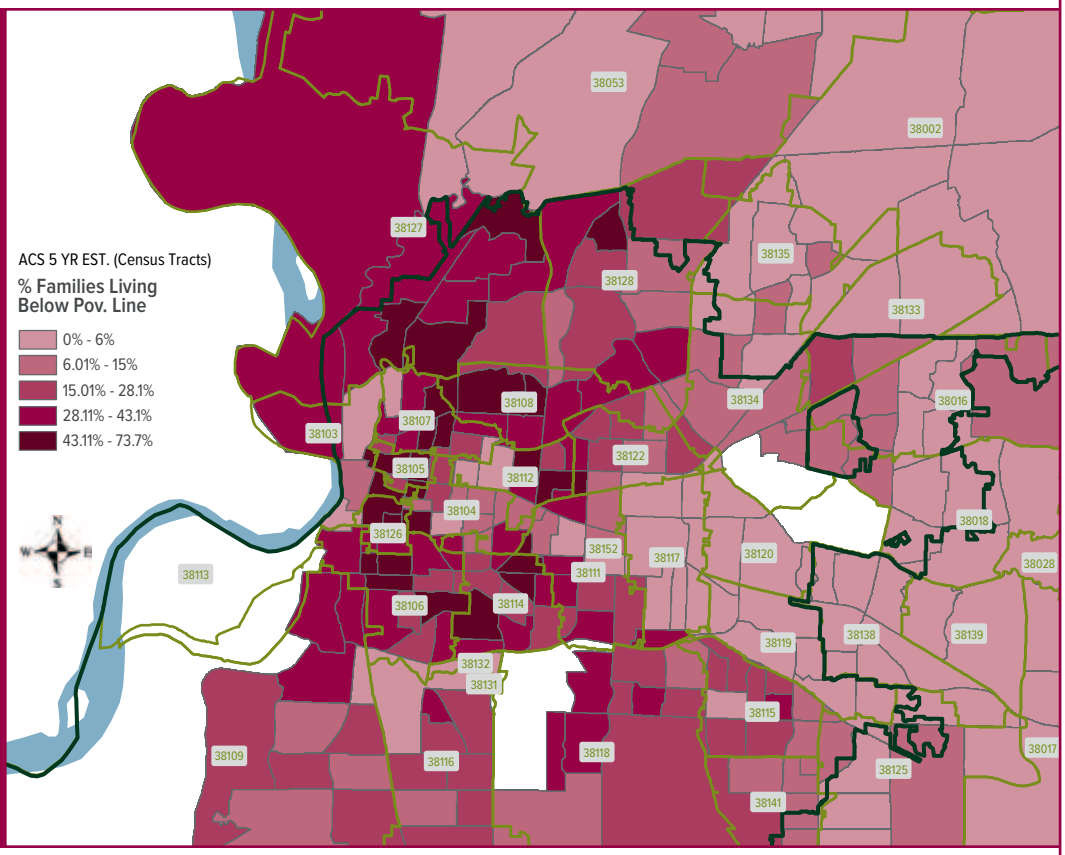


FIGURE 3: Percent of Families Living Below the Poverty Line, Shelby County

Source: US Census Bureau, American Community Survey 5 Year Estimates, 2006-2010

Poverty

Research suggests that there is a critical threshold or "tipping point" of neighborhood poverty. When the percentage of poor families in a neighborhood reaches 20 to 30 percent, negative family and child outcomes increase sharply.[5]

High-poverty neighborhoods are typically defined as having more than 30 percent of households living below the federal poverty threshold.[6] Children in high-poverty neighborhoods are at higher risk of health problems, behavioral difficulties, teen pregnancy, high school dropout, and substance abuse, even after accounting for family characteristics.[5]

FIGURE 3 shows each Census Tract's percentage of families living in poverty.

- Census Tract 45 (Zip Code 38126) has the largest percentage of families that are living below the poverty line (73.7%).
- Census Tract 204 (38053) has the lowest percentage of families that are living below poverty with 0.6 percent.
- In 12 out of 221 Census Tracts, 50 percent or more of families are living below the poverty line.

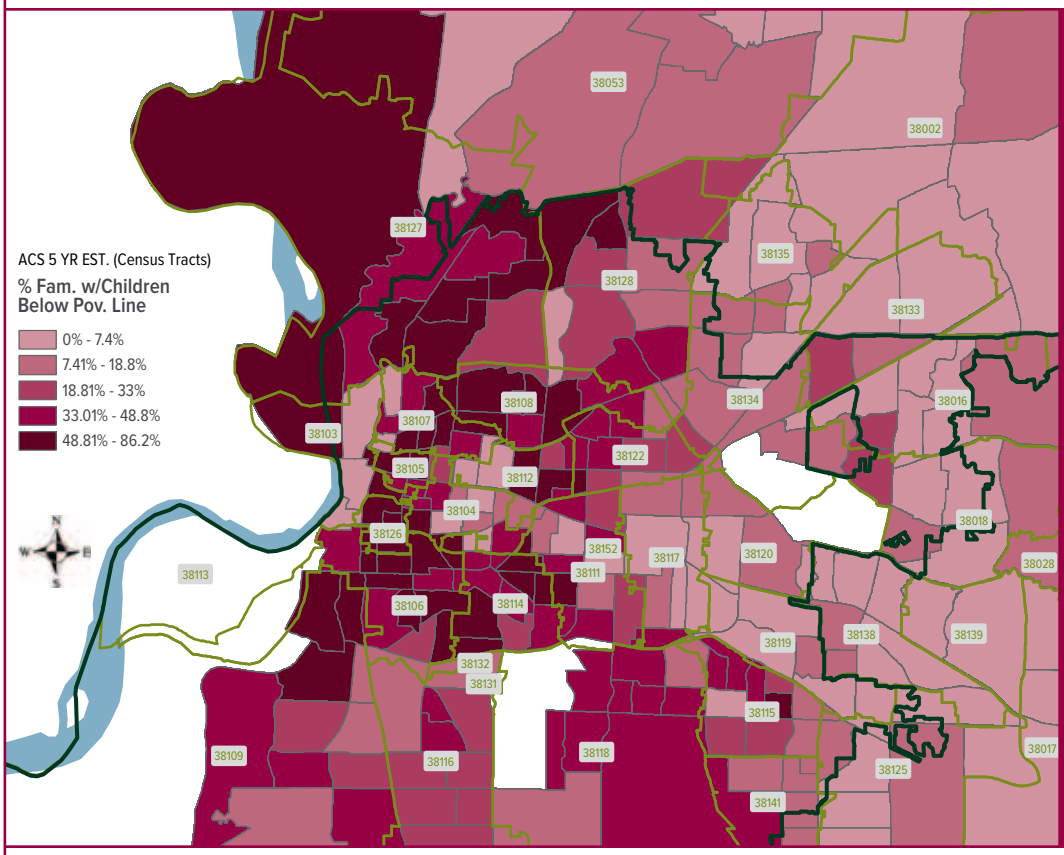


FIGURE 4:
Percent of Families with Children Living in Poverty, Shelby County

Source:
US Census Bureau, American Community Survey 5 Year Estimates, 2006-2010

Child Poverty

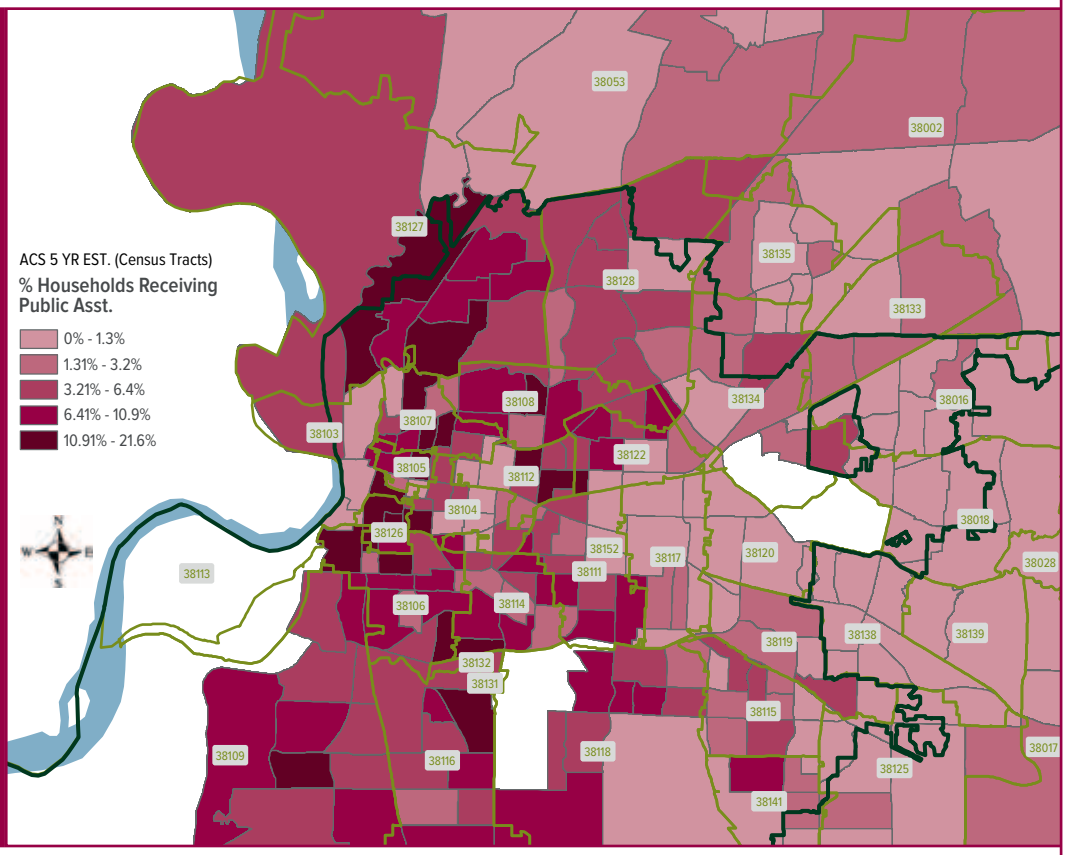
Living in high-poverty neighborhoods is associated with lower-quality learning experiences in the homes of young children, even after family income is taken into account. Child poverty can affect physical health, cognitive abilities, educational achievement, and emotional and social adjustment.[7,8] Recent research has even linked early poverty to long-term changes in children's brain development.[9,10]

In Shelby County, high-poverty neighborhoods are also neighborhoods with large numbers of children. FIGURE 4 shows the distribution of Shelby County families with children living in poverty.

- Census Tract 8 (Zip Code 38108) has the largest percentage of families with children that are living below the poverty line in the county, with 86.2 percent.
- Tract 208.20 (38002) has the lowest percentage of families living below poverty.
- In 41 out of 221 Census Tracts, at least 50 percent of families with children are living below the poverty line.

FIGURE 5:
Percent of Households receiving Public Assistance Income, Shelby County

Source:
US Census Bureau, American Community Survey 5 Year Estimates, 2006-2010



Public Assistance

Further evidence of the economic distress experienced by many Shelby County families is presented in FIGURE 5, which shows the receipt of public assistance income.

- Tract 45 (Zip Code 38126) has the highest percentage of households receiving public assistance (21.6 %).
- 34 out of 221 tracts have no households receiving public assistance.

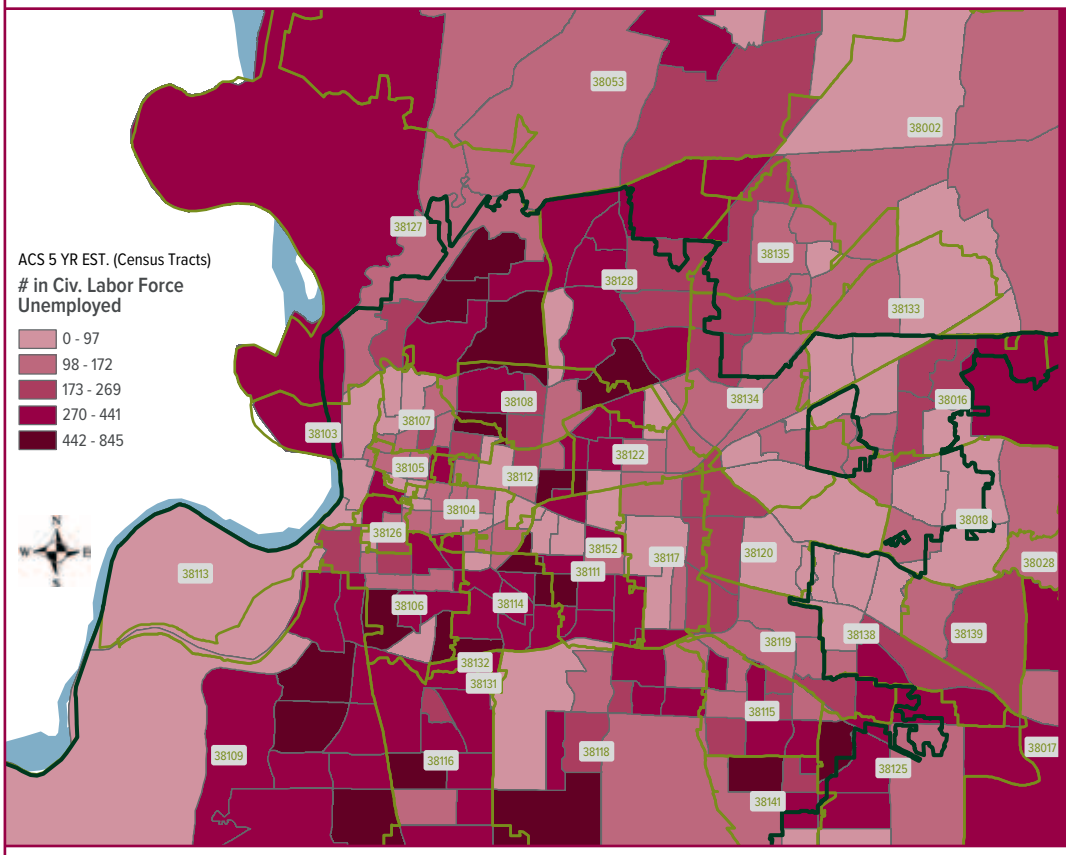


FIGURE 6: Number Unemployed Individuals in Civilian Labor Force, Shelby County

Source: US Census Bureau, American Community Survey 5 Year Estimates, 2006-2010

Unemployment

FIGURE 6 shows Census Tract patterns of unemployment in Shelby County. (Our measure of unemployment is based on census estimates of individuals who were not working but were able, available, and actively looking for work.)

- The largest number of people unemployed is in Census Tract 100 (Zip Codes 38114/38104) with 845 unemployed.
- The largest percentage of people unemployed is in Tract 46 (38104) with 24.6 % unemployed.
- The lowest number of people unemployed is in Tract 37 (38103/38104) with 8 individuals.
- The lowest percentage of people unemployed is in Tract 37 (38103/38104) with 0.6% unemployed.

Education promotes positive and effective parenting.

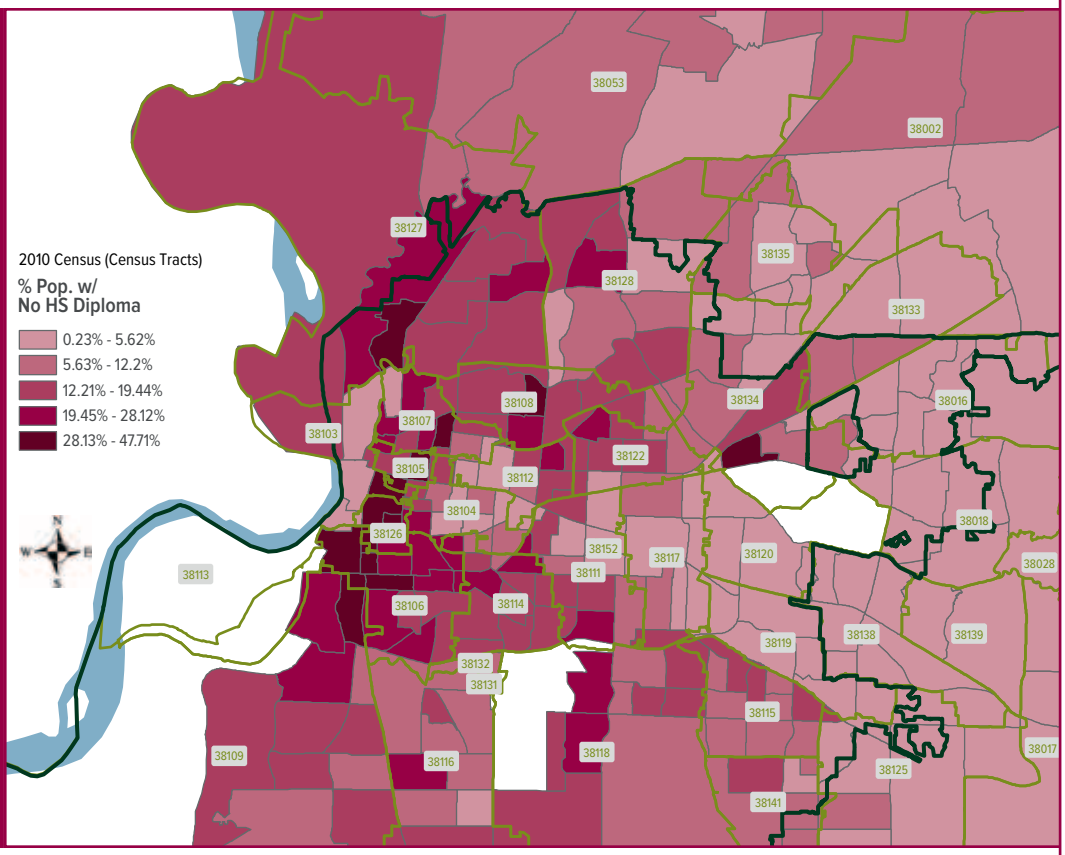


FIGURE 7: Percent of Individuals with no High School Diploma, Shelby County

Source: US Census Bureau, American Community Survey 5 Year Estimates, 2006-2010

Parental education is strongly tied to children's well-being. Better-educated parents tend to engage in more positive parenting and create more positive home environments for their children.[11]

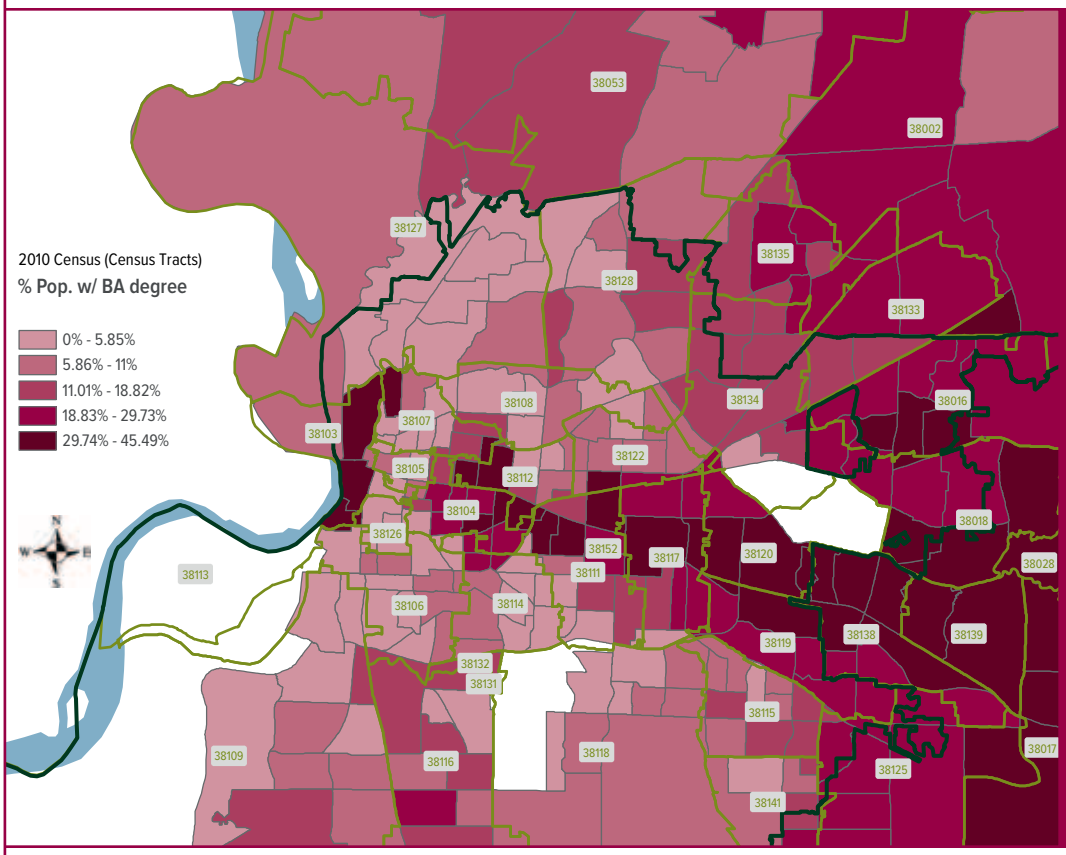


FIGURE 8:
Percent Population with a Bachelor's Degree, Shelby County

Source:
US Census Bureau, American Community Survey 5 Year Estimates, 2006-2010

FIGURES 7 and 8 show the low levels of educational attainment among Shelby County adults. FIGURE 7 presents the distribution of adults without a high school diploma; FIGURE 8 shows the percentages of residents who have earned a Bachelor of Arts degree.

- Census Tracts with the highest percentages of adults with no high school diplomas are found in Zip Codes 38126 and 38106.
- According to census estimates, Census Tract 4 (Zip Codes 38107/38108), Tract 14 (38112), Tract 45 (38126), and Tract 2 (38107) have 0 individuals that have earned a BA degree.
- Zip Code 38139 contains the Census Tracts with the highest number of individuals who have earned BA Degrees.

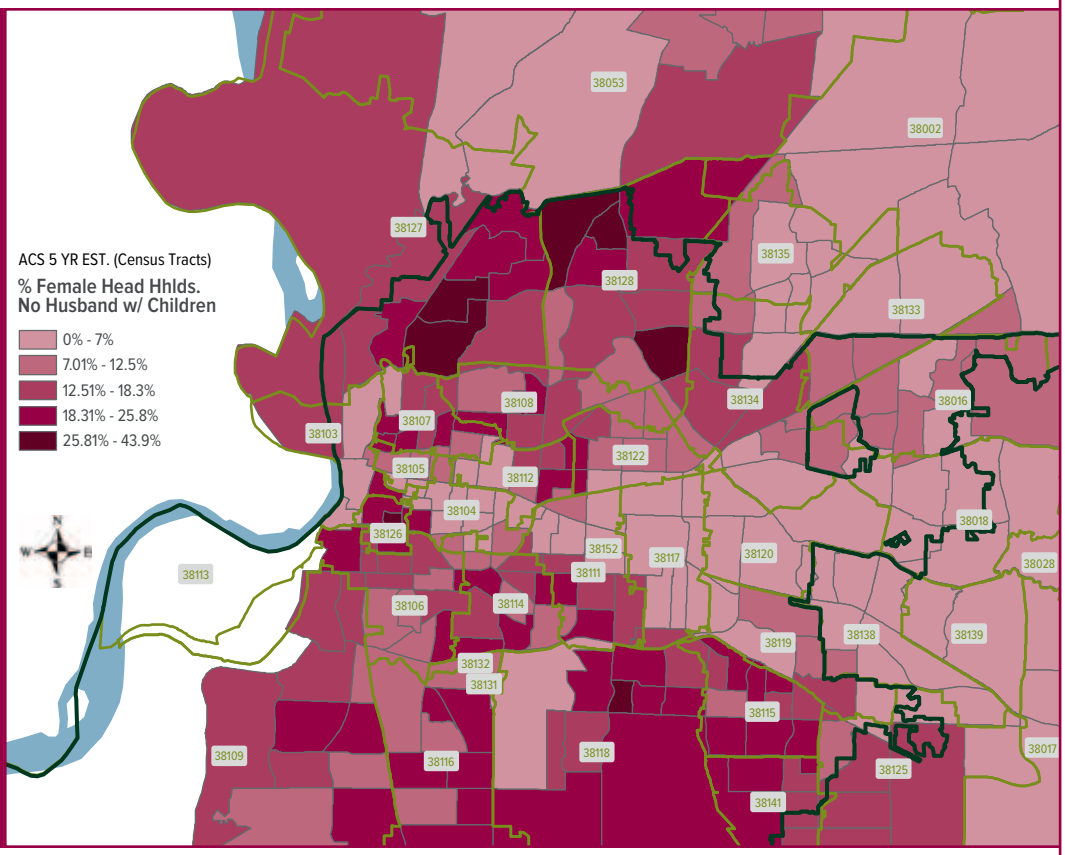


FIGURE 9: Percent of Female Head of Household, No Husband Present, with Children, Shelby County

Source: US Census Bureau, American Community Survey 5 Year Estimates, 2006-2010

On average, children in single-parent families are at higher risk than other children.

Researchers have tried to determine why children in single-parent families tend to have worse outcomes than children of married parents. Many studies of family structure conclude that it is not living with a single-parent that places a child at risk, but the economic difficulties and other problems that often accompany single-parenthood. Other studies find that children of single-parents fare worse than children of married couples, even when family incomes are similar.[8, 12]

FIGURE 9 shows Census Tract percentages of single-mother households with children.

- Census Tract 45 (Zip Code 38126) has the largest percentage of single-mother families (43.9%).
- Tract 73 (Zip Codes 38111/38117) has the lowest percentage at 0.9 percent.

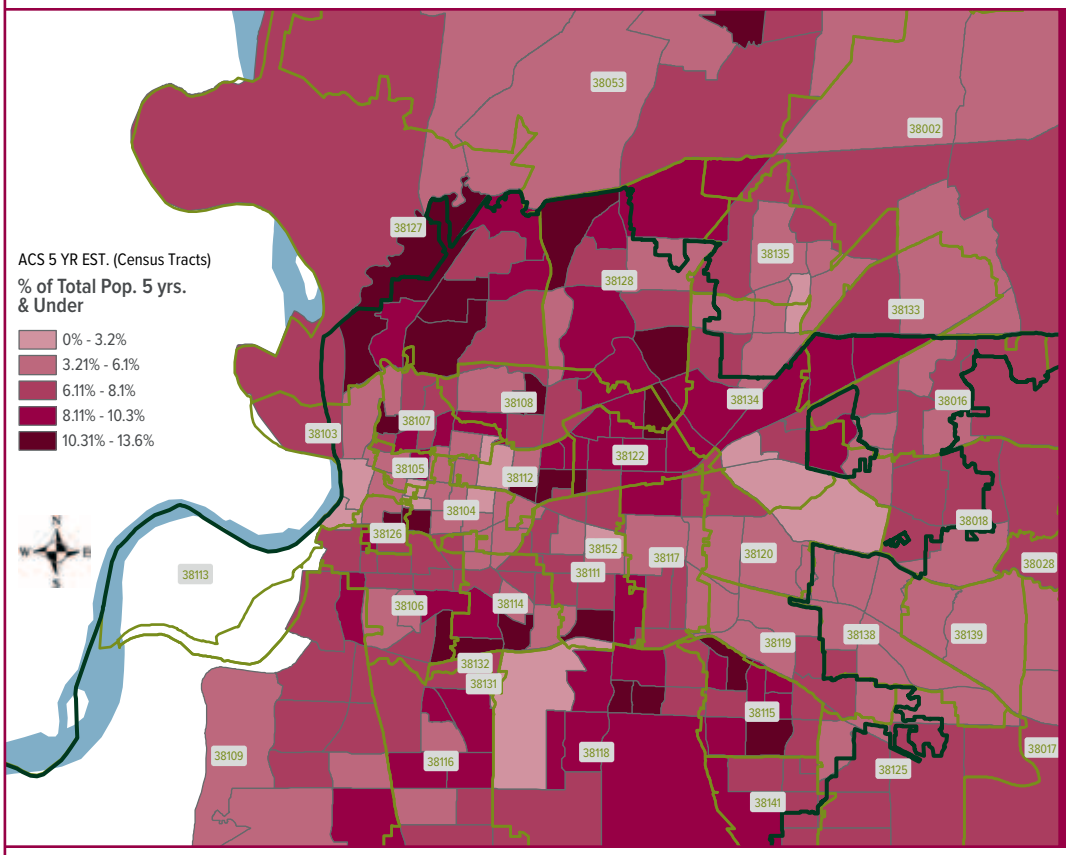


FIGURE 10: Percent of Total Population 5 Years and Under, Shelby County

Source: US Census Bureau, American Community Survey 5 Year Estimates, 2006-2010

Too many of Shelby County's youngest children are at risk.

Taken together, the statistics presented in this chapter have troubling implications for the well-being of Shelby County's young children. The prevalence of neighborhood risk factors means that children can be at risk even when their families provide them with a nurturing and stimulating home environment.

Early disadvantage appears to be especially detrimental to children's development. For example, income and economic circumstances appear to have stronger effects in early childhood than in adolescence.[13]

FIGURE 10 shows the population of children under age 5 in Shelby County. Comparing this pattern to those of the maps above shows that a disproportionate number of our community's children live in high-risk neighborhoods.

- The Census Tracts with the highest concentration of children are 106.20 (Zip 38118) and 217.10 (Zip Code 38115), each with 13.6 percent.
- The lowest percentage is in Tract 73 (38111/38117) with 1.2%.

Shelby County is undergoing dramatic population changes.

Shelby County residential patterns have begun to change in recent years. The population of Memphis' central areas is decreasing, while outlying areas of Shelby County are gaining population. In order to combat neighborhood-level risk for Shelby County's children, we need a more thorough understanding of these trends and the ways they will affect the county's future population.

FIGURE 11 shows changes in Shelby County's population by Zip Code from 2000 to 2010. A negative change represents a decrease in population; a positive change represents population growth.

- 38105 and 38106 in Memphis and 38018 in Cordova saw the biggest losses in population between 2000 and 2010.
- 38002 in Arlington and 38103 and 38125 in Memphis saw the most population growth.

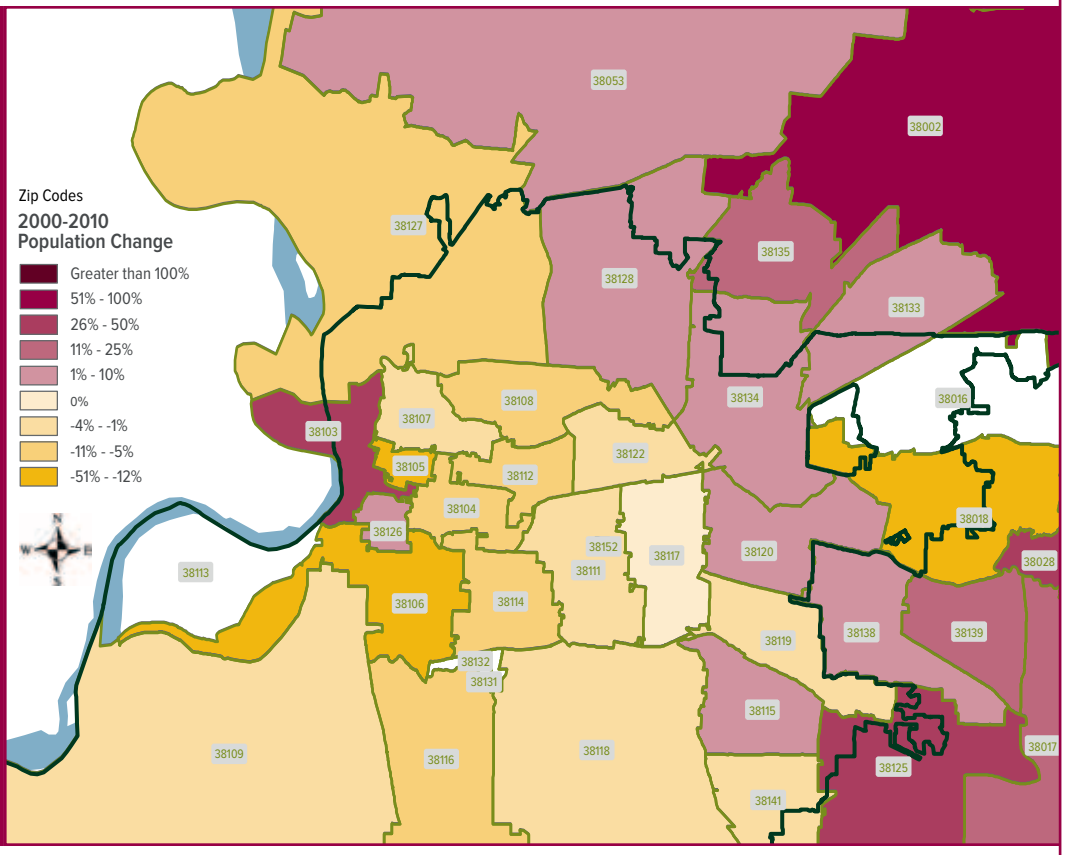


FIGURE 11: Population Change 2000-2010, Shelby County

Source: US Census Bureau, 2000-2010

References

1. Galster G, Marcotte DE, Mandell M, et al. The influence of neighborhood poverty during childhood on fertility, education, and earnings outcomes. *Housing Studies*. 2007; 22(5):723-751.

2. Berger LM, Paxson C, Waldfogel J. Income and child development. *Children and Youth Services Review*. 2009; 31: 978–989.

3. Fantuzzo JW, Rouse HL, McDermott PA, et al. Early childhood experiences and kindergarten success: A population-based study of a large urban setting. *School Psychology Review*. 2005; 34: 571-588.

4. Sampson RJ, Morenoff JD, Gannon-Rowley T. Assessing "neighborhood effects": Social processes and new directions in research. *Annual Review of Sociology*. 2002; 28: 443– 478.

5. Mather M, Rivers KL. *The concentration of negative child outcomes in low-income neighborhoods*. 2006. Annie E. Casey Foundation. Available at: http://www.aecf.org/upload/publicationfiles/census.pdf

6. Leventhal T, Brooks-Gunn J. Changes in neighborhood poverty From 1990 to 2000 and youth's problem behaviors. *Developmental Psychology*. 2011; 47(6):1680-98.

7. Brooks-Gunn J, Duncan GJ. The effects of poverty on children. *The Future of Children*. 1997; 7(2): 55-71.

8. Sarsour K, Sheridan M, Jutte D, et al. Family socioeconomic status and child executive functions: The roles of language, home environment, and single parenthood. *Journal of the International Neuropsychological Society*. 2011; 17: 1–13.

9. Hanson JL, Chandra A, Wolfe BL, et al. Association between income and the hippocampus. PLoS ONE. 2011; 6(5): e18712.

10. Noble KG, Houston SM, Kan E, et al. Neural correlates of socioeconomic status in the developing human brain. *Developmental Science*. 2012; in press, 1–12.

11. Magnuson KA, Sexton HR, Davis-Kean PE, et al. Increases in maternal education and young children's language skills. *Merrill-Palmer Quarterly*. 2009; 55 (3): 319-350.

12. Carlson MJ, Corcoran ME. Family structure and children's behavioral and cognitive outcomes. *Journal of Marriage and Family*. 2001; 63(3): 779-792.

13. Duncan GJ, Ziol-Guest KM, Kalil A. Early childhood poverty and adult attainment, behavior, and health. *Child Development*. 2010; 81: 306–325.

The Nurse-Family Partnership in Memphis

Since 1987, my colleagues and I have been conducting a large study in Memphis to determine the long-term effectiveness of the Nurse-Family Partnership (NFP), a home visiting program aimed at improving the health of at-risk mothers and their children.

Designed for mothers who have limited financial resources and are bearing their first child, NFP has three major goals:

- to improve prenatal health and promote positive birth outcomes
- to support children's development and well-being by encouraging positive and effective parenting practices
- to increase the economic well-being of families by helping mothers clarify their life goals and make informed decisions about work, education, and future pregnancies

Mothers typically register before the 28th week of pregnancy, and the program lasts through the first two years after birth. During this time, specially trained registered nurses visit families in their homes, forming close, collaborative relationships focused on improving maternal and infant health. Nurses encourage the involvement of other family members and friends and link families with outside services when needed. For most of the program's duration, nurses visit families every two weeks. (Visits are weekly for the first six weeks after birth and monthly during the program's last 4 months.)

David Olds, PhD, leads the Prevention Research Center for Family and Child Health at the University of Colorado and is the founder of the Nurse-Family Partnership.

Evaluating the Program

Our evaluation of the Memphis NFP was designed to allow researchers to follow long-term outcomes for families who completed the program. In 1991, about 1300 Memphis women registering for prenatal care were offered participation in this study; over 1100 chose to enroll. Eighty-five percent of participants lived in families with incomes below the Federal Poverty Level.

After enrollment, each family was randomly assigned to one of two groups. The first group participated in the full Nurse-Family Partnership home visiting program and also received free transportation for prenatal care, periodic screening for children's development, and referrals to agencies when needed. The second (or "comparison") group did not participate in the home visiting program; they received only the transportation, screening and referral services.

After families completed the program, we continued to collect information on how they were faring. By observing differences in the two groups, we can estimate the added value of the NFP program beyond the basic services we provided to both groups of families. In other words, we can see how NFP affects health and development from pregnancy through late childhood.

Maternal Outcomes

The study results indicate that the Nurse-Family Partnership has positive effects on families. On several measures, nurse-visited mothers and children have had substantially better outcomes than mothers and children in the comparison group.

Compared to mothers in the comparison group, NFP mothers

- were 35 percent less likely to develop Pregnancy-Induced Hypertension (a pregnancy complication characterized by dangerously high blood pressure).
- had 23 percent fewer closely spaced subsequent pregnancies during the first two years following birth of the first child.

Child Outcomes

Children of participating families had better outcomes across many measures compared to children in the comparison group.

By age 2, NFP children

- had 23 percent fewer healthcare visits for treatment of injuries.
- had 79 fewer days of hospitalization for injuries and ingestions.

By age 6, NFP children

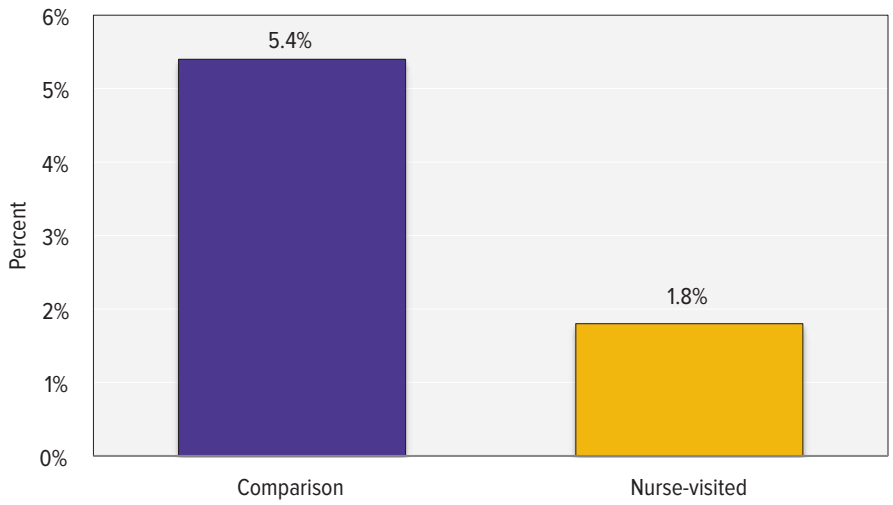
- performed better on tests of intellectual functioning and language development.
- had 67 percent fewer social and emotional problems (FIGURE 1).

At age 12, nurse-visited children

- reported 83 percent less use of illegal substances (FIGURE 2).
- were 29 percent less likely to report clinically significant symptoms of depression and anxiety (FIGURE 3).

FIGURE 1: Percent of Children with Socio-emotional Problems at Age 6 in Comparison and Nurse-Visited Groups

Source: Kitzman HJ, Olds, DL, Cole, RE, et al. Enduring effects of prenatal and infancy home visits by nurses on children. Archives of Pediatric and Adolescent Medicine. 2010; 164(5):412-418.



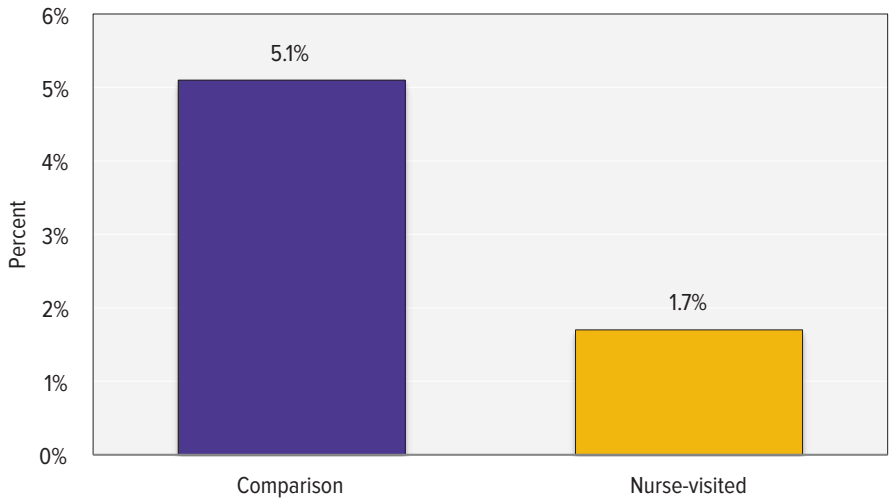


FIGURE 2:
Percent of 12-year Old Children Who Used Tobacco, Alcohol, or Marijuana at Age 12 in Comparison and Nurse-Visited Groups

Source: Kitzman HJ, Olds, DL, Cole, RE, et al. Enduring effects of prenatal and infancy home visits by nurses on children. Archives of Pediatric and Adolescent Medicine. 2010; 164(5):412-418.

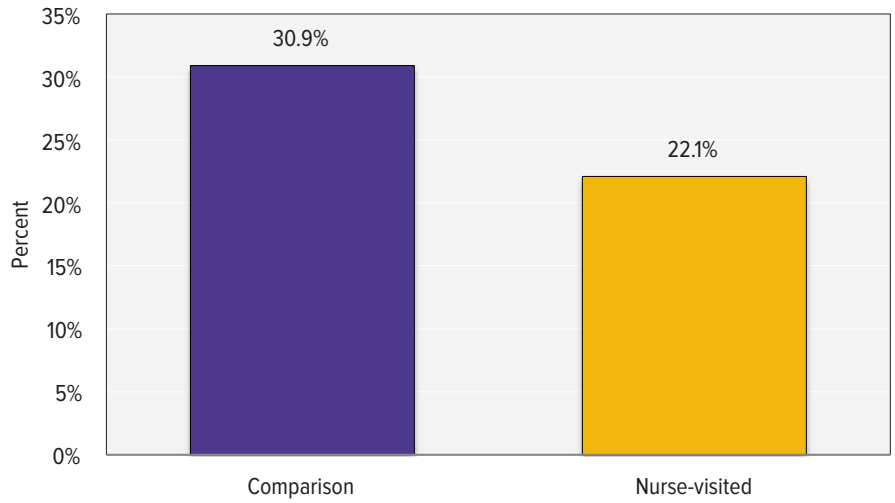
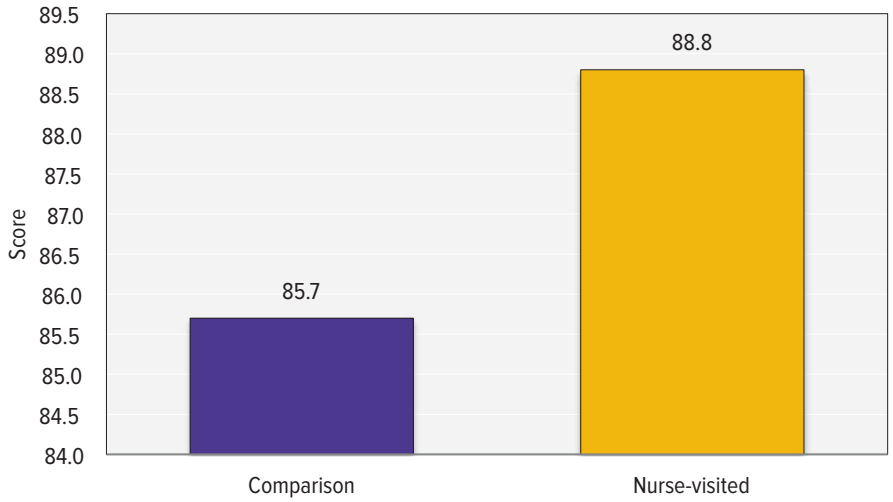


FIGURE 3:
Percent of Depression/Anxiety Among 12-Year Old Children in Comparison and Nurse-Visited Groups

Source: Kitzman HJ, Olds, DL, Cole, RE, et al. Enduring effects of prenatal and infancy home visits by nurses on children. Archives of Pediatric and Adolescent Medicine. 2010; 164(5):412-418.

FIGURE 4: Average Reading and Math Achievement Test Scores Among 12-Year Old Children (Born to Mothers With Low Psychological Resources) in Comparison and Nurse-Visited Groups

Source: Kitzman HJ, Olds, DL, Cole, RE, et al. Enduring effects of prenatal and infancy home visits by nurses on children. Archives of Pediatric and Adolescent Medicine. 2010; 164(5):412-418.



Many benefits of the program were more pronounced among mothers who had fewer psychological resources at the time they enrolled in the study. Past research shows that mothers with more symptoms of depression and anxiety, lower intellectual functioning, and limited sense of control over their lives often find it harder to care for their children effectively compared to mothers with more psychological resources. Evaluation results suggest that NFP may be particularly beneficial for these families:

- Program effects on childhood injuries were stronger for children of mothers with low psychological resources.
- Effects on cognitive and language functioning at age 12 were more pronounced among children of low-resource mothers (FIGURE 4).

Family Economic Well-Being

Nurse-Family Partnership families also fared better on measures of economic well-being. In the years between enrollment and the 12-year follow-up, families visited by nurses used fewer government entitlement services (Medicaid, food stamps, and cash assistance) than families in the comparison group. This reduced federal spending by about $12,300 per family (in 2006 dollars), which was more than the cost of providing the NFP program ($11,500 in 2006 dollars). In other words, public investment in NFP was returned through its effects on these three entitlement programs alone.

Conclusion

The Memphis Nurse-Family Partnership program was delivered through the Memphis/Shelby County Health Department. Because we reached such a large portion of the eligible population and provided the program through a local institution, we believe that the findings of this study have broad applicability to families in need throughout the community.

Today, the Nurse-Family Partnership serves families in Memphis through Le Bonheur Children's Hospital. It is also being expanded throughout the United States and in six other developed countries—in large part because of its remarkable success in Memphis. Additional information on the NFP can be found on its website: www.nursefamilypartnership.org.

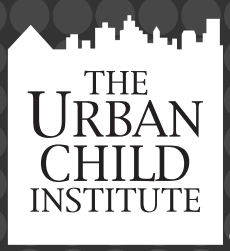
References:

1. Kitzman H, Olds DL, Cole R, et al. Enduring effects of prenatal and infancy home visiting by nurses on children: Age-12 follow-up of a randomized trial. *Archives of Pediatric and Adolescent Medicine*. 2010; 164(5):412-418.

2. Kitzman H, Olds DL, Henderson CR Jr., et al. Effect of prenatal and infancy home visitation by nurses on pregnancy outcomes, childhood injuries, and repeated childbearing: a randomized controlled trial. *Journal of the American Medical Association*. 1997; 278(8):644-52.

3. Olds DL, Kitzman H, Cole R, et al. Effects of nurse home visiting on maternal life-course and child development: age-six follow-up of a randomized trial. *Pediatrics*. 2004;114: 1550-9.

4. Olds DL, Kitzman H, Cole R, et al. Enduring effects of prenatal and infancy home visiting by nurses on maternal life-course and government spending: age-12 follow-up of a randomized trial. *Archives of Pediatric and Adolescent Medicine*. 2010: 164(5):419-424.



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