

ADVERSE CHILDHOOD EXPERIENCES

in Shelby County, Tennessee



Commissioned by a Shelby County, Tennessee community collaborative comprised of Baptist Memorial Hospital for Women, Knowledge Quest and Porter-Leath, in partnership with the Adverse Childhood Experiences Task Force of Shelby County

Prepared by The Research and Evaluation Group at PHMC



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Executive Summary

Negative experiences during childhood, such as suffering child abuse or neglect or parental substance abuse, not only impact quality of life during childhood, but these negative experiences also have a detrimental impact on the health and wellbeing of that child as an adult. These negative experiences, also known as adverse childhood experiences (ACEs), have been linked to an increase in risky health behaviors during adulthood, such as smoking, illicit drug use and multiple sexual partners. A high number of ACEs have also been associated with poor health outcomes in adulthood, such as heart attack, cancer and depression.

In May 2014, the collaborative of Baptist Memorial Hospital for Women, Knowledge Quest and Porter-Leath, in partnership with the ACE Task Force of Shelby County, Tennessee, commissioned Public Health Management Corporation (PHMC) to conduct a telephone survey to assess the prevalence of ACEs in Shelby County, Tennessee. The survey found that ACEs are common in Shelby County, as an estimated 361,200 adults (52%) have experienced at least one ACE. One out of five adults in Shelby County (21%) experienced two to three ACEs and twelve percent of adults experienced 4 or more ACEs. The most common ACEs among adults in Shelby County are emotional abuse (23%), emotional neglect (25%) and substance abuse in the household (25%).

A dose-response relationship was seen between ACEs and poor health; both risky and negative health behaviors and with selected outcomes. After controlling for gender, age, race/ethnicity, and educational status, compared to a person with no ACEs, an adult in Shelby County with 4 or more ACEs has significantly greater odds of rating their health as fair or poor, being a problem drinker or current smoker, having had 30 or more sexual partners, having used illicit drugs, having had a sexually transmitted infection, having been diagnosed with depression, and having attempted suicide.

Employment status, ability to work and perspective on job opportunities were also found to be associated with ACEs. After controlling for gender, age, race/ethnicity, and educational status, compared to a person with no ACEs, an adult in Shelby County with 4 or more ACEs has significantly greater odds of being unemployed, unable to work and feel they have insufficient job opportunities.

Many adults also reported that they experienced adversities in their community or neighborhood while growing up. Thirty seven percent of adults reported that while growing up they witnessed someone being shot or stabbed and one in five reported that they didn't feel safe in their neighborhood or that their neighbors could be trusted.

The results presented in this report follow the trends found in other studies about adverse childhood experiences. They suggest a need for policy and program development to prevent ACEs among Shelby County youth and reduce the impact of ACEs experienced by youth and adult Shelby County residents to improve overall health and wellbeing.

Introduction

Negative experiences in childhood, such as abuse and neglect have been found to increase the risk for poor health behaviors, health problems, and higher mortality rates during adulthood. A child who is experiencing abuse, neglect, or other adversities and who does not have a stable, responsive relationship with an adult, may experience an excessive or prolonged activation of the physiologic stress response systems, known as toxic stress.

These adverse experiences during childhood, such as suffering child abuse or neglect or parental substance abuse not only impact the life of a child, but may also have a detrimental impact on the health and wellbeing of that child as an adult.

What are ACEs?

In 1998, doctors Vincent Felitti and Robert Anda, along with their colleagues, published a groundbreaking paper that examined the association between childhood adversity and health outcomes in adulthood. The Adverse Childhood Experiences Study (ACE), as it came to be known, was based on a survey and review of medical records of more than 17,000 patients of Kaiser Permanente's San Diego Health Appraisal Clinic, California.^{i ii} The ACE Study found that adverse childhood experiences were quite common. The study defined ACEs as:

- Child abuse (physical, emotional, and sexual),
- Child neglect (physical, emotional), and
- Household dysfunction (mental illness, incarcerated relative, mother treated violently, substance abuse, divorce).

Among the participants in the ACE Kaiser Study, 63 percent reported having ACEs in at least one of the categories defined above and 12 percent

reported having 4 or more categories of adverse childhood experiences (ACE).ⁱⁱⁱ

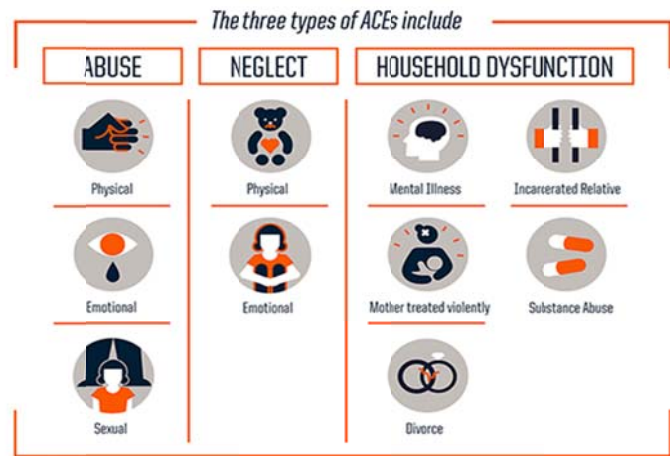


Image courtesy of the Robert Wood Johnson Foundation

Strikingly, the original ACE Study found a relationship between ACEs and adult health risks, such as alcoholism, smoking, use of illicit drugs, and risky sexual activity. These risky health behaviors often precipitate poor health outcomes, including chronic health conditions. Compared to persons with no ACEs, a person with 4 or more ACEs was found to be:^{iv}

- 12.2 times as likely to have attempted suicide,
- 7.4 times as likely to consider themselves to be an alcoholic,
- 4.7 times as likely to have ever used illicit drugs,
- 4.6 times as likely to have had two or more weeks of depressed mood in the past year,
- 3.2 times as likely have had 50 or more intercourse partners, and
- 2.3 times as likely to currently smoke.

In addition, ACEs were found to have a dose-response relationship to poor self-rated health, as well as disease conditions such as ischemic heart disease, cancer, chronic lung disease, skeletal fractures, and liver disease. As the number of ACEs increased, the risk of negative health outcomes increased.

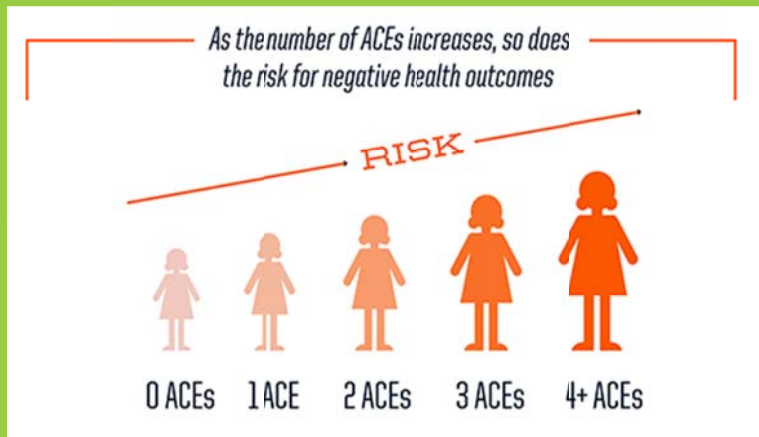
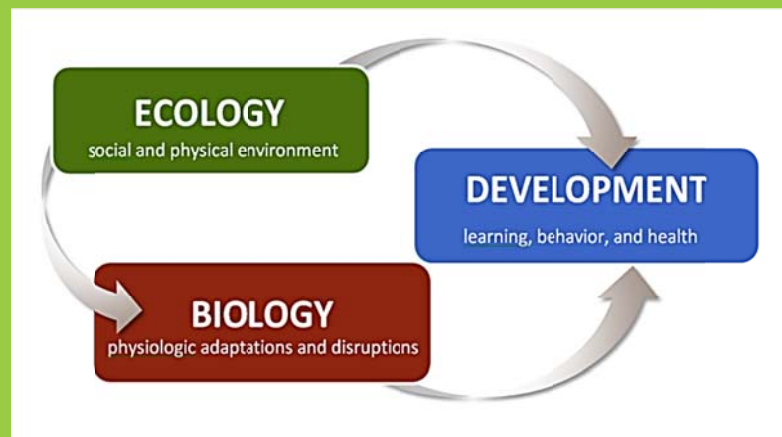


Image courtesy of the Robert Wood Johnson Foundation



Model adapted from American Academy of Pediatrics

Compared to those with no ACEs, a person with 4 or more ACEs was found to be:

- 3.9 times as likely to have chronic bronchitis or emphysema,
- 2.4 times as likely to have had hepatitis or jaundice,
- 2.2 times as likely to have had ischemic heart disease,
- 1.9 times as likely to have had cancer, and
- 2.2 times as likely to have fair or poor self-rated health.

How do ACEs impact health?

Additional research in the fields of neuroscience, molecular biology, genomics, and developmental biology among others has provided evidence about how early experiences and environmental influences can leave a lasting effect on the developing brain and long-term health. Toxic stress, the strong, frequent, or prolonged activation of the body's stress response systems in the absence of the buffering protection of a supportive adult relationship can disrupt the development of the brain as well as other organ and metabolic systems during sensitive developmental periods. This disruption may result in learning impairments and physical and

mental illness. Negative experiences, such as ACEs are just one cause of toxic stress.^v

Are there other childhood adversities?

Since 1998 more than 60 articles have been published by doctors Felitti and Anda and others examining the relationship between ACEs and health risk behaviors and health outcomes. In recent years this community of ACE researchers has begun to acknowledge and recognize that ACEs are not the only negative experiences that cause toxic stress. Other negative experiences during childhood that may create toxic stress include experiencing homelessness, bullying, discrimination, and child trafficking; witnessing violence in the community; living in a war zone; and being forced into marriage. This community of ACE researchers has begun to explore how to expand the conventional ACEs to look at other negative experiences in childhood and assess their impact on health behaviors and health outcomes.

For example, the ACE International Research Network, led by the World Health Organization and the United States Centers for Disease Control and Prevention, developed the ACE International Questionnaire to measure a range of adversities across low, middle and high-income countries. The questionnaire includes the conventional ACE

questions used in the original Kaiser Study as well as additional questions about other negative childhood experiences, such as parental death, bullying, physical fights with peers, witnessing violence in the community, exposure to war, and whether a family member was killed by soldiers, police, militia or gangs.^{vi}

In Philadelphia, Pennsylvania the Institute for Safe Families (ISF) commissioned an ACE survey of Philadelphia adults.^{vii} ISF's goal was to assess ACEs, as well as adversities related to the neighborhood or community that one grows up in that may have long term impacts on health and wellbeing. The ACE Survey, created by the Philadelphia ACE Task Force and Public Health Management Corporation, included the conventional ACE questions as well as questions about the following community adversities:

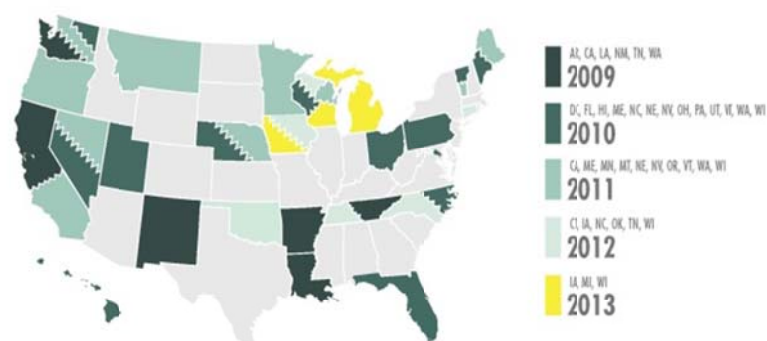
- Neighborhood safety and trust
- Bullying
- Witness violence
- Racism/Discrimination

Where have ACEs been measured?

The original ACE Kaiser Study was conducted in California with patients at Kaiser Permanente's San Diego Health Appraisal Clinic. The prevalence of ACEs has also been assessed at the state level. In 2008, the Centers for Disease Control and Prevention (CDC) developed an ACE module for use in the Behavioral Risk Factor Surveillance System (BRFSS), a state-based surveillance system operated by state health departments in collaboration with the Centers for Disease Control and Prevention. BRFSS is a telephone survey that collects information on health risk behaviors, prevalence of chronic diseases, use of preventive health practices, injury, and health care access.

The ACE module was first administered in 2009 to five states: Arkansas, Louisiana, New Mexico,

Tennessee, and Washington.^{viii} As of 2013, 26 states and the District of Columbia have implemented the ACE module.



Although the study ended in 1997, some states are collecting information about ACEs in their population through the Behavioral Risk Factor Surveillance System (BRFSS).

Image credit: Centers for Disease Control and Prevention

The Kaiser Study and the ACE module used in the BRFSS state studies have assessed ACEs in populations that are primarily white with a high education level. The population of the original ACE Study conducted by Felitti, Anda, et al. included patients at Kaiser Permanente's San Diego Health Appraisal Clinic who were 80 percent white and 43 percent were college graduates. The population of the respondents to the 2009 BRFSS ACE module used in five states, including Tennessee, was also primarily white (74.8%) and with a high education level (e.g., 39.3% were college graduates or higher).

There is a growing body of literature examining ACEs in communities that are not predominately white or have a high degree of education. In the United States, researchers are beginning to look at ACEs in urban settings which have a higher percentage of the population who are economically disadvantaged, have lower educational status, and are racial/ethnic minorities compared to the population found in the original Kaiser and BRFSS surveys. These studies include a cohort study of ACEs in an urban, minority sample in the United States;^{ix} a retrospective chart review of pediatric patients in

a low-income, urban community,^x and focus group discussions to identify and characterize the adverse experiences faced by youth from a low-income urban community.^{xi}

In addition, ACEs have been studied in an urban setting in the Philippines,^{xii} a developing country, and among young adults in the eastern European Region.^{xiii}

Shelby County ACE Survey

In May 2014, the ACE Center Task Force of Shelby County, Tennessee was established to create a trauma-informed community, engaging residents in understanding the costly and harmful outcomes of toxic stress on all families that arise from adverse childhood experiences. The ACE Task Force of Shelby County is composed of more than 40 local leaders, including staff from Porter-Leath, dedicated to raising community awareness about the costly and harmful outcomes of toxic stress arising from adverse childhood experiences.

To learn more about the underlying prevalence of adverse childhood experiences in the Shelby County community, the collaborative contracted with Public Health Management Corporation (PHMC) to conduct a telephone survey of residents in Shelby County. The survey assessed the prevalence of ACEs, health risk behaviors and health conditions among adults. Findings from this survey provide county-level data which can be used to guide program planning and drive local policy.

Methods

The Shelby County ACE Survey was fielded in the summer of 2014 through a random-digit dial telephone survey with households in Shelby County, Tennessee. A total of 1,506 interviews were conducted with adults 18 and older who spoke English or Spanish. Just over

40 percent of respondents (606) were reached on their cell phones.

The sample was stratified to ensure representation across Shelby County, both within and outside of the City of Memphis. Approximately two-thirds of the sample (1,003 respondents) lived within the city at the time of the interview, with the remaining 503 outside of the city.

Potential respondents were invited to participate on behalf of a collaboration between Baptist Memorial Hospital for Women, Knowledge Quest and Porter-Leath, and told that their responses would allow us to better understand problems that may occur early in life, and may help others in the future. Each respondent was assured of the anonymity of their responses.

The survey questionnaire was developed by PHMC, in consultation with the collaborative. Questions were modeled on existing items in use in prior studies, including the Behavioral Risk Factor Surveillance System ACE Module, the Kaiser Permanente ACE Study, and the Philadelphia ACE Study. To facilitate comparisons with findings from Tennessee's and other states' BRFSS surveys, questions about physical abuse, emotional abuse, sexual abuse, substance abuse, mental illness, violence between adults, and household member in prison were worded as



they are in the ACE module used in the BRFSS survey. Questions about emotional and physical neglect, which are not asked in the ACE module in the BRFSS Survey, were adapted from the Kaiser ACE Study and from USDA research on food insecurity. To facilitate comparisons with findings from Tennessee's and other states' BRFSS surveys, questions about neglect were not included in this report's findings describing the ACE score, ACE prevalence, or the statistical analysis assessing the relationship between ACEs and health behaviors and health outcomes.

Abuse

- Physical abuse:
 - A parent or adult living in your home ever hit, beat, kick or physically hurt you in any way, not including spanking
- Emotional abuse:
 - A parent or adult in your home more than once swore at you, insulted you, or put you down
- Sexual abuse:
 - An adult or someone at least five years older touched you in a sexual way or had you touch their body in a sexual way or forced you to have sex

Household Dysfunction

- Substance abusing household member
 - You lived with anyone who was a problem drinker or an alcoholic
 - You lived with anyone who used illicit street drugs or abused prescription medications
- Mentally ill household member
 - You lived with anyone who was depressed, mentally ill, or suicidal
- Violence between adults
 - Once or more than once your parents or other adults in the home slapped, hit, kicked, punched or beat each other up

Findings about neglect are described in "Child Neglect and Other Adversities in the Home" section of this report. A question about parental separation or divorce was not included in this survey.

Differences in wording between the Shelby County ACE Study, the original Kaiser ACE Study and the BRFSS ACE module can be found in Appendix B. To assess the presence of ACEs, adults were asked about the following during their first 18 years of life:

- Household member in prison
 - You lived with anyone who served time or was sentenced to serve time in a prison, jail, or other correctional facility

Neglect

- Emotional neglect:
 - Often or very often you felt there was no one in your family who loved you or thought you were important or special
 - Often or very often you felt that your family didn't look out for each other, feel close to each other, or support each
- Physical neglect¹:
 - Your family cut the size of meals or skipped meals because there was not enough money in the budget for food

¹ Due to time limitations, the proxy "food insecurity" was used as the indicator for physical neglect (i.e., How often did your family cut meals because there was not enough money in the budget for food?)

Recognizing that there are other childhood negative experiences related to caregiving and to the childhood home(s), but not measured on the conventional ACE categories, the survey also asked about the following negative experiences:

- Foster care
 - You were ever in foster care
- Corporal punishment
 - You were spanked a few times a year or more
- Verbal violence between adults
 - Parent or adult in home was yelled at, screamed at, sworn at, insulted, or humiliated
- Threatened by an adult
 - Parent or other adult in home acted in a way that made you afraid you would be physically hurt

The survey also asked questions that measure stresses outside of the home, in the community in which one grew up. These community stressor questions were developed by the Philadelphia ACE Task force for the Philadelphia ACE Survey commissioned by the ISF ². These community adversity questions were taken from the California Health Interview Survey Adult Questionnaire; the Adverse Childhood Experiences International Questionnaire; the National Survey on Children's Exposure to Violence; and the CDC Family Health History and Health Appraisal questionnaire.

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<http://www.instituteforsafefamilies.org/philadelphia-urban-ace-study>

Community Adversities

- Neighborhood safety and trust
 - You felt safe in your neighborhood
 - You felt that people in your neighborhood looked out for each other, stood up for each other, and could be trusted
- Bullying
 - You were bullied by a peer or classmate
- Witness violence
 - You saw or heard someone being stabbed or shot in real life
- Racism
 - You were treated badly or unfairly because of your race or ethnicity

Finally, the ACE questionnaire also included questions about perceived health status, current health behaviors (e.g., number of sexual partners, smoking status, problem drinker, and use of illicit drugs) and current health conditions (e.g., coronary heart disease, jaundice, sexually transmitted infection). Survey questions also addressed socio-demographic indicators.

For in-depth survey methodology and description of analyses, see Appendix B.



Adverse Childhood Experiences in Shelby County

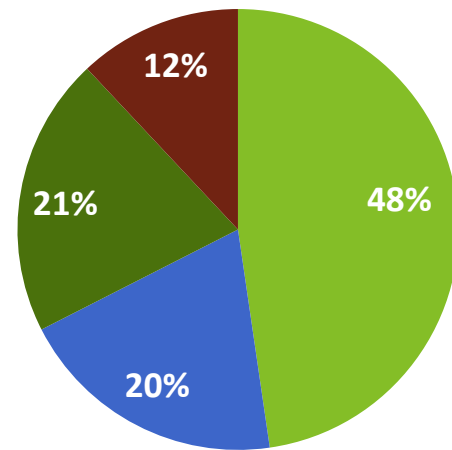
Adverse Childhood Experiences (ACEs) are common among adults in Shelby County, with 52 percent of the adult population, an estimated 361,200 adults, having experienced at least one ACE. One out of five adults experienced two to three ACEs (21%) and 12 percent of adults in Shelby County experienced 4 or more ACEs (Figure 1).³

Prevalence of ACE scores by Sociodemographic Characteristics

As found in the Kaiser Study and from states that used the ACE module in the BRFSS survey, younger adults were more likely to report experiencing 4 or more ACEs than older adults. In Shelby County, 11 percent of adults aged 30-59 indicated they had experienced 4 or more ACEs while 5 percent of adults 60 – 74 years experienced 4 or more ACEs (Table 1). There are a number of possible reasons to explain this difference. Older adults may be less likely to recall ACEs than younger adults; may recall their past experiences differently; or may feel a stronger taboo towards reporting experiences of abuse or neglect. Older adults with ACEs may be more difficult to reach due to potentially higher rates of early morbidity and mortality among those with ACEs, especially multiple ACEs.

Women and men experienced ACEs at similar rates (Table 2). This finding is different from the original Kaiser Study which found that females reported experiencing more ACEs than males.

Figure 1. Shelby County Prevalence of ACEs and Population Estimates



- 0 ACEs (329,408 adults)
- 1 ACE (136,999 adults)
- 2-3 ACEs (141,603 adults)
- 4 or more ACEs (82,607 adults)

Table 1. ACE Scores by Age

Age Group	Number of ACEs			
	0	1	2-3	4+
18-29	42%	18%	19%	21%
30-59	45%	21%	23%	11%
60-74	57%	19%	19%	5%
75+	70%	21%	6%	3%

Table 2. ACE Scores by Gender

Gender	Number of ACEs			
	0	1	2-3	4+
Male	45%	20%	23%	12%
Female	49%	20%	19%	12%

³ To provide comparison to the BRFSS ACE module, the emotional and physical neglect questions have been omitted from the ACE score calculations.

Adults of all races and ethnicities reported experiencing ACEs (Table 3); similar to other studies. Approximately one out of two adults, regardless of race or ethnicity, has experienced one or more ACEs.

Adults with less than a high school education were more likely to report experiencing 4 or more ACEs than those who graduated from college (Table 4). Among adults who did not complete high school, 15 percent had experienced 4 or more ACEs; among college graduates only seven percent had experienced 4 or more ACEs.

Adults who are living in or near poverty, defined as having a household income below 200 percent of the Federal poverty guidelines, were more likely to report having experienced 4 or more ACEs compared with adults who live at or above 200 percent of the poverty level (Table 5).⁴ Among adults living in or near poverty in Shelby County, 16 percent reported having experienced 4 or more ACEs while 9 percent of adults living at or above 200 percent of the poverty level reported experiencing 4 or more ACEs.

Adults who live in Memphis were more likely to report experiencing 4 or more ACEs than adults in suburban Shelby County (Table 6). Among adults in Memphis, 13 percent reported experiencing 4 or more ACEs while 9 percent of adults who live in the suburbs experienced 4 or more ACEs.

Table 3. ACE Scores by Race and Ethnicity

	Number of ACEs			
	0	1	2-3	4+
White (Not Latino)	48%	21%	21%	11%
Black (Not Latino)	46%	20%	21%	13%
Latino	52%	21%	19%	8%
Other	46%	7%	26%	22%

Table 4. ACEs by Educational Attainment

Educational level	Number of ACEs			
	0	1	2-3	4+
Less than high school	44%	17%	24%	15%
High school	47%	20%	20%	14%
Some college	43%	21%	23%	13%
College grad	56%	20%	17%	7%

Table 5. ACEs by Poverty Status

Poverty level	Number of ACEs			
	0	1	2-3	4+
< 200% poverty	41%	20%	24%	16%
At or above 200% of poverty	53%	20%	19%	9%

Table 6. ACEs by Residence

Residence	Number of ACEs			
	0	1	2-3	4+
Memphis	45%	20%	22%	13%
Suburban Shelby County	54%	20%	18%	9%

⁴ The Department of Health and Human Services 2013 Poverty Guidelines were used to create 200% poverty based on respondent's estimates of their family income in the prior year. The cutoff for 200% poverty is \$22,980 for a single householder and \$47,100 for a family size of four residing in the same household.



Individual ACEs in Shelby County

In Shelby County, the prevalence of conventional ACEs followed the trends seen in previous studies. As in the Kaiser Study and other states' findings, emotional abuse is the most prevalent ACE in Shelby County (Figure 2): 23 percent of adults in Shelby County reported that they had experienced emotional or verbal abuse as a child (i.e., a parent or another adult in their home swore at, insulted, or put them down). One out of five adults (20%) reported that they experienced sexual abuse as a child and 14 percent reported that they experienced physical abuse as a child.

As found in the Kaiser Study and other state findings, the most common household dysfunction ACE indicator in Shelby County was living in a household with someone who was an alcoholic or used drugs. One quarter (25%) of adults reported that they lived in a household with someone who had substance abuse problems (i.e., problem drinker or alcoholic, someone who used illegal street drugs or who abused prescription medication) (Figure 3).

One out of five adults (22%) reported that they witnessed violence between adults at least once in their childhood home and 13 percent lived with someone who suffered from a mental illness (i.e., depressed, mentally ill, or suicidal). Additionally, 12 percent of adults indicated that they shared a home with someone who served time or was

sentenced to serve time in a prison, jail, or other correctional facility (Figure 3).

Figure 2. Childhood Abuse ACEs in Shelby County, TN 2014

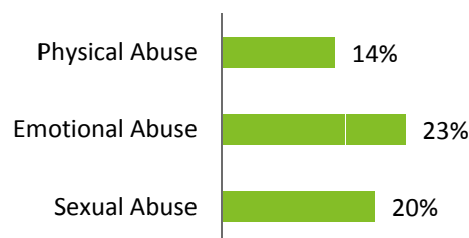
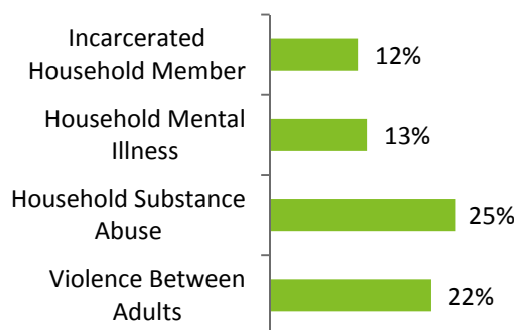


Figure 3. Household Dysfunction ACEs in Shelby County, TN 2014



Comparison of ACEs in Shelby County, the state of Tennessee, and Five-States

Childhood Abuse

The trends in prevalence of the conventional ACEs in Shelby County are similar to the findings about ACEs in the state of Tennessee as measured by the ACE module implemented as part of the BRFSS in 2012^{xiv} as well as the findings about ACE as measured using the ACE module of the BRFSS in 2009 in five states: Tennessee, as well as, Arkansas, Louisiana, New Mexico, and Washington. Emotional abuse was the leading childhood abuse ACE indicator in Shelby County, the state of Tennessee, and the five-state BRFSS

Study⁵ (23%, 25%, and 26% respectively) (Figure 4).^{6,7}

The rates for the ACE indicator physical abuse were similar among adults in Shelby County, state of Tennessee, and the five-state BRFSS Study (14%, 14%, and 15% respectively). The reported rate of child sexual abuse was higher for adults in Shelby County (20%) compared to adults in the state of Tennessee (11%), and from adults in the five-state BRFSS Study (12%).

Household Dysfunction

The prevalence of household dysfunction ACEs, such as violence between adults, substance abuse in household, mental illness in household, and incarcerated household member showed similar patterns among Shelby County adults, adults in the State of Tennessee, and adults in the five states who completed the ACE module in BRFSS in 2009.

The leading household dysfunction ACE among adults in Shelby County, the state of Tennessee, and the five-states that completed the ACE BRFSS module was substance abuse in household. The prevalence of substance abuse was slightly lower in Shelby County compared with Tennessee and the five states. One out of four Shelby County

adults (25%), 30 percent of adults in Tennessee, and 29 percent of adults from the five-state BRFSS Study reported that they lived in a household where there was substance abuse (Figure 5).

Figure 4. Childhood Abuse ACEs in Shelby County, Tennessee, and Five States

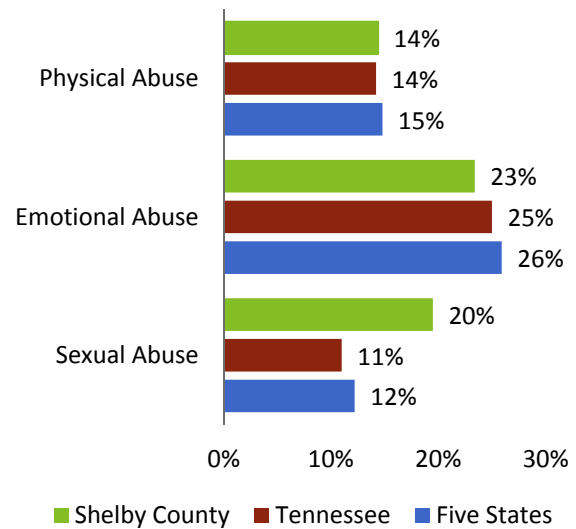
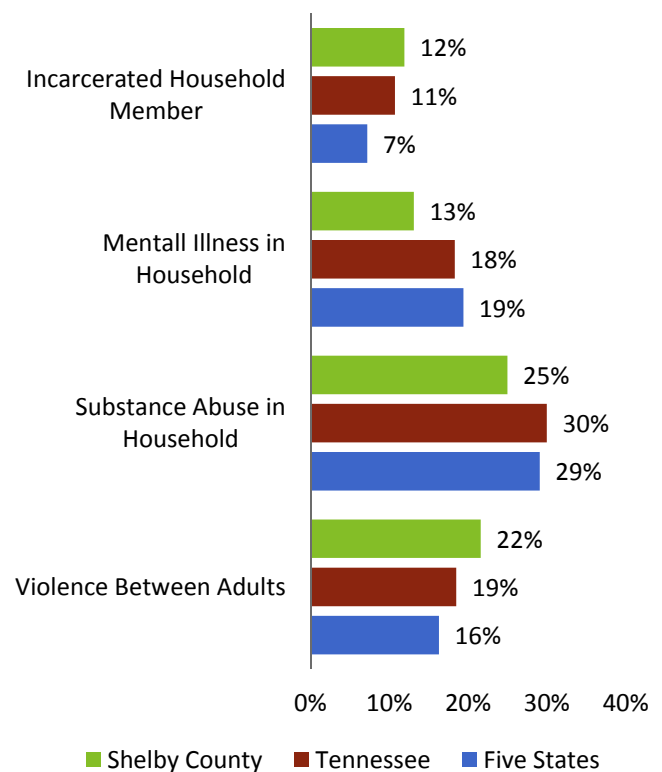


Figure 5. Household Dysfunction ACEs in Shelby County, Tennessee, and Five States



⁵ The five-state BRFSS Study included the state of Tennessee.

⁶ Emotional and physical neglect were not measured by the Tennessee BRFSS nor on the five states BRFSS; thus comparisons between Shelby County, Tennessee, and the five states BRFSS on emotional and physical neglect are not made here.

⁷ Shelby ACE and BRFSS surveys both collect data via phone facilitating comparisons between them.



Adults from Shelby County had slightly higher rates of violence between adults in their childhood household (22%) while growing up

compared to adults from the state of Tennessee (19%) and from the five-state BRFSS Study (16%). Adults from Shelby County had similar rates of living in a childhood home with someone who served time or was sentenced to serve time in prison compared to the State of Tennessee (12% and 11% respectively), while the five-states BRFSS survey found lower rates (7%).

Adults from Shelby County reported lower rates of mental illness in the household (13%) compared to adults in the state of Tennessee (18%) and adults from the five states (19%).

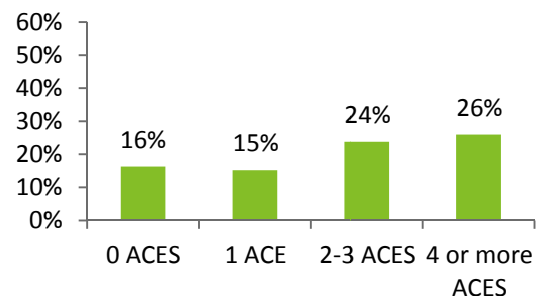
ACE Scores, Health Risks, and Employment in Shelby County

Self-assessed health

Self-assessed health status of adults in Shelby County, Tennessee was affected by a higher ACE score. Among adults with 4 or more ACEs, 26 percent rated their personal health status as either fair or poor while adults with no ACEs rated their health status as fair or poor 16 percent of the time (Figure 6).

The relationship between ACEs and self-rated health status was found to be statistically significant. An adult with 4 or more ACEs has 2.1 times greater odds than adults with no ACEs in rating their health as fair or poor.⁸

Figure 6. Fair or Poor Self- Rated Health Status



⁸ This difference was tested for statistical significance after controls for gender, age, educational status, and race/ethnicity were implemented in order to determine whether demographic differences between the 4 or more and no ACE groups were the underlying cause of (footnote continued)

health status differences. After controls in binary logistic regression, significance was maintained (Wald chi-square <.05) with adults with 4 or more ACEs having 2.1 times greater adjusted odds than adults with no ACEs in rating their health as fair or poor.

Risky Behaviors

Higher ACE scores were also associated with risky health behaviors. Risky behaviors included being a current smoker, problem drinking, having had over 30 sexual partners, and illicit drug use. Dose-response relationships were observed for all risky health behaviors measured, meaning that the more ACEs a person experienced, the more likely he or she was to engage in the behavior.

Forty one percent of adults with 4 or more ACEs and 14 percent of adults with no ACEs were current smokers (Figure 7). Problem drinking, that is having five or more drinks during at least one occasion over the past 30 days, was reported by 28 percent of adults with 4 or more ACEs and by 10 percent of adults with no ACEs (Figure 8).

Nineteen percent of adults with 4 or more ACEs and 5 percent of adults with no ACEs reported having had more than 30 sexual partners (Figure 9). The strongest dose-response relationship was observed for illicit drug use as 54 percent of adults with 4 or more ACEs and 18 percent of adults with no ACEs reported having used illicit drugs at least once (Figure 10).

These associations between higher ACE score and risky health behaviors were found to be statistically significant for each variable measured.⁹ When controlling for gender, age, educational status and race/ethnicity, adults with 4 or more ACEs had 3.7 times greater odds of being a current smoker, 3.1 times greater odds of being categorized as a problem drinker, 4.4 times

greater odds of having had 30 or more sexual partners and 4.5 times greater odds of having had used illicit drugs at least once compared to adults with no ACEs.

Figure 7. Current Smoker

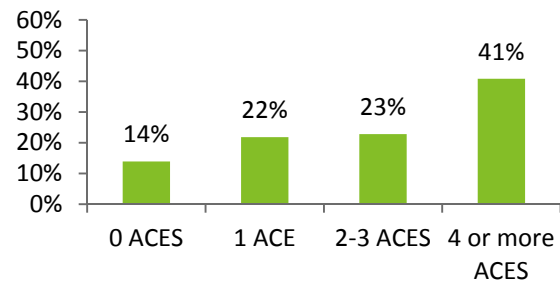


Figure 8. Problem Drinking

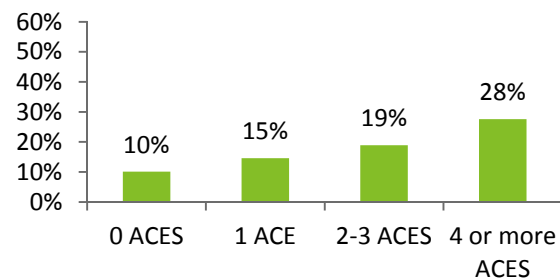


Figure 9. Multiple Sexual Partners (30+)

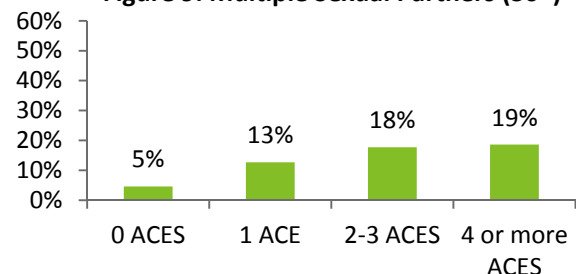
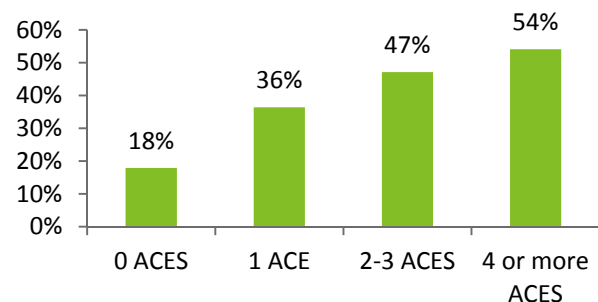


Figure 10. Illicit Drug Use



⁹These relationships were found to be highly statistically significant bivariate (Pearson chi-square, $p < .001$), as well as multivariate (binary logistic regression, $p < .001$).

Physical Health Outcomes

Rates of poor physical health outcomes were higher among adults who reported a larger number of childhood adversities; however this relationship was not as strong as the relationship between ACEs and risky health behaviors

Figure 11. Heart Attack

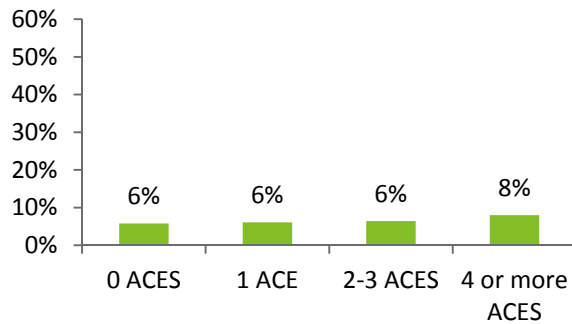


Figure 12. Jaundice and Other liver Problems

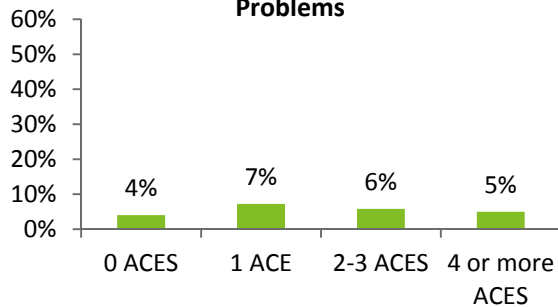
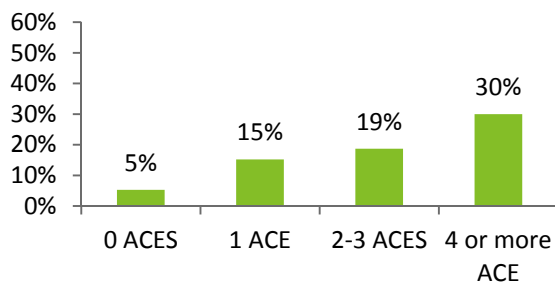


Figure 13. STI



Among adults with 4 or more ACEs, 8 percent had experienced a heart attack while 6 percent of adults with no ACEs had experienced a heart attack (Figure 11). This relationship between ACEs and heart attack was not found to be statistically significant, both bivariate and multivariate after demographic controls.

A dose-response relationship was also not observed for ACEs and jaundice or other liver trouble and the relationship was not found to be statistically significant. The rates of jaundice and other liver problems among adults with 4 or more ACEs (5%) was similar to the rates for adults with no ACEs (4%) (Figure 12).

A dose-response relationship was seen for ACEs and having an STI. Thirty percent of adults with 4 or more ACEs had been told by a doctor that they had an STI while only 5 percent of those with no ACEs had an STI (Figure 13). After controlling for gender, age, educational status and race/ethnicity, adults with 4 or more ACEs had 7.2 times greater odds than adults with no ACEs to ever have had an STI.¹⁰

¹⁰ The relationship was found to be statistically significant bivariate (Pearson chi-square, $p < .001$) as well as multivariate (binary logistic regression, $p < .001$).

Mental Health Outcomes

ACEs have also been associated with mental health challenges as an adult. Dose-response relationships were observed between ACE score and both mental outcomes measured: depression and suicide attempt.

More than fifty percent of adults with 4 or more ACEs reported having been diagnosed with depression, while only 15 percent of adults with no ACEs had been diagnosed with depression (Figure 14).

Adults with a higher number of ACEs were more likely to report having attempted suicide: 29 percent of adults with 4 or more ACEs reported a suicide attempt while only 2 percent of adults with no ACEs reported having had a suicide attempt (Figure 15).

The relationships between ACEs and mental health outcomes were found to be significant after adjusting for demographic controls.¹¹ Adults with 4 or more ACEs had 5.6 times greater adjusted odds of being diagnosed with depression and 20.7 times greater adjusted odds of having attempted suicide than adults with no ACEs

Figure 14. Depression

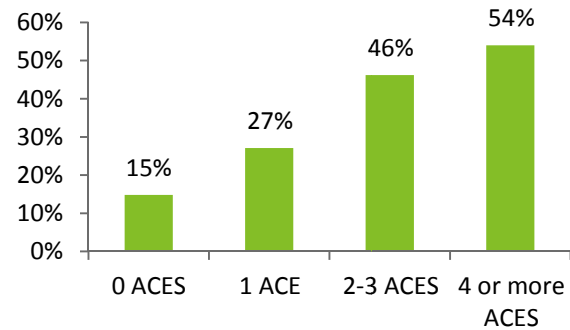
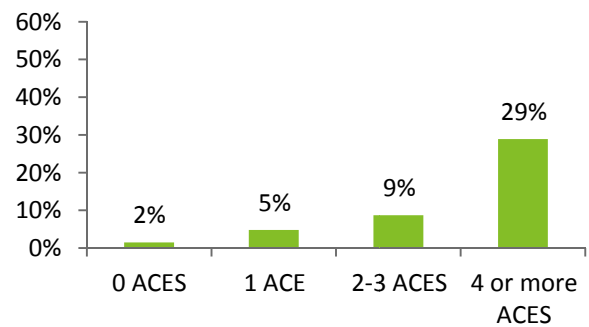


Figure 15. Suicide Attempt



¹¹ The Wald Chi Square statistics is significant at .05.

Employment Outlook

ACEs may also impact outlook about job opportunities and employment status and ability to work. A dose-response relationship was observed for ACEs and perceptions of sufficient job opportunities. Among adults with 4 or more ACEs, 44 percent felt that they had insufficient job opportunities available to them in Shelby County, while 16 percent of adults with no ACEs felt they had insufficient job opportunities (Figure 16).

When asked about their current employment status, 17 percent of adults with 4 or more and 7 percent of adults with no ACEs were unemployed. Fifteen percent of adults with 4 or more ACEs and 8 percent of adults with no ACEs were unable to work or disabled (Figure 17).

When controlling for gender, age, educational status, and race/ethnicity, adults with 4 or more ACEs had 3.6 times greater odds of feeling they had insufficient job opportunities; 2.1 times greater odds of being unemployed and 2.6 times greater odds of being unable to work than adults with no ACEs.¹²

Figure 16. Insufficient Job Opportunities

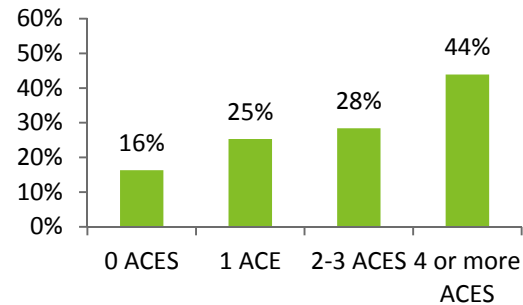
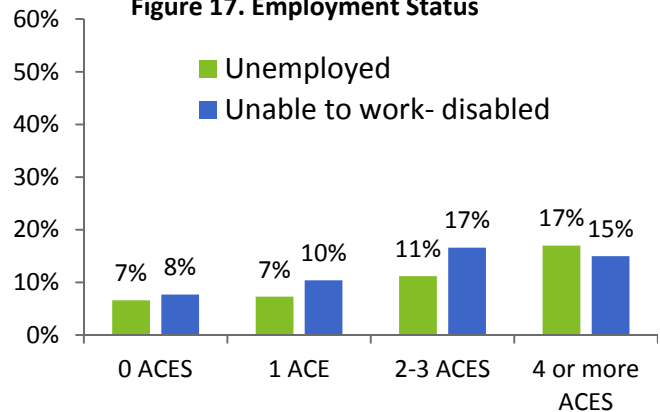


Figure 17. Employment Status



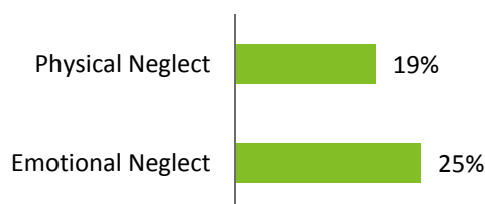
¹² The Wald Chi Square statistics is significant at .05 for each of these adjusted odds ratios.

Child Neglect and Other Adversities in the Home

Physical and emotional neglect during childhood is considered to be an ACE. Neglect measures were not included in the original Kaiser Study, but were added in a second survey wave of the Kaiser Study and included in subsequent publications. Neglect measures were not included in the BRFSS ACE module. In order to provide comparisons between ACE prevalence in Shelby County and BRFSS, findings about neglect were not included in the analysis previously described, but instead are described below.

One out of four adults (25%) in Shelby County indicated that they experienced emotional neglect as a child (Figure 18). That is, they felt that no one in their family loved them, thought they were important or special; their family did not look out for each other, were not close to each other, or did not support each other. Approximately one out of five adults (19%) reported that they experienced physical neglect.¹³

Figure 18. Prevalence of Childhood Neglect ACEs, Shelby County, Tennessee, 2014



In addition to ACEs, this survey also assessed other childhood adversities related to a caregiver or that may occur in the childhood home(s), such as experiencing corporal punishment (i.e., spanking) and witnessing a parent or another adult raising them be verbally abused. Among adults in Shelby County:

- 65% were spanked as a child
- 37% witnessed their parent or another adult raising them be verbally abused (e.g., yelled at, screamed at, sworn at, insulted or humiliated)
- 12% grew up in a household with an adult who made them feel threatened, that is, the adult acted in a way that made them afraid they would be physically hurt
- 2% lived in foster care



¹³ Physical neglect was measured by food insecurity (i.e., their family sometimes cut the size of meals or skipped meals because there was not enough money in the budget for food).

Community Adversities

As noted previously, toxic stress during childhood may be caused by ACEs. However, other negative experiences may also cause toxic stress. These negative experiences may include community adversities such as witnessing violence in the neighborhood and experiencing discrimination based on one's race or ethnicity.

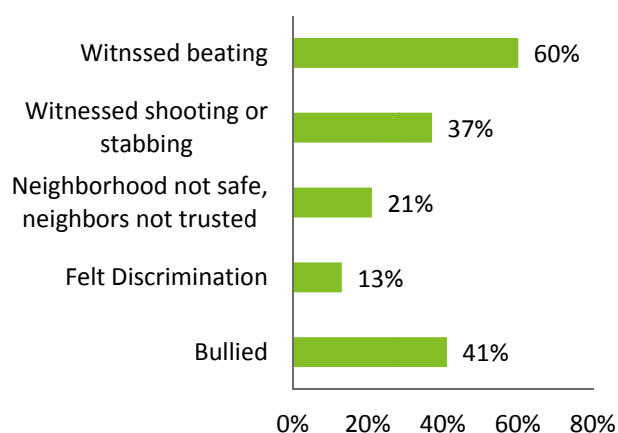
The prevalence of adults in Shelby County who experienced community adversities while growing up is shown in Figure 19. Among adults in Shelby County, 37 percent reported having seen someone shot or stabbed and 60 percent saw someone being beaten up.

One out of five adults reported that none of the time or only some of the time they felt safe in their neighborhood or that none of the time or only some of the time they felt that people in their neighborhood looked out for each other, stood up for each other, and could be trusted (21%).



More than 10 percent of adults (13%) reported that while growing up they felt discriminated against often or very often due to their race or ethnicity. Two out of five adults (41%) reported they were bullied as a child.

Figure 19. Community ACEs in Shelby County, TN 2014



Discussion

Adverse childhood experiences are common in Shelby County. An estimated 361,200 adults have experienced at least one ACE. The most common ACEs are emotional abuse (23%), emotional neglect (25%) and substance abuse (25%). Findings from this study confirmed the relationship between the conventional ACEs (abuse and household dysfunction) and risky health behaviors. Specifically, this study confirmed the relationship between ACEs and STIs, depression, and suicide attempts. A relationship between ACEs and heart attack and ACEs and jaundice was not found. This could be due to under-reporting of ACEs among the older age group. The fact that reported health status was significantly lower among the high ACEs group suggests that relationships with life-threatening chronic conditions cannot be ruled out. The study also confirmed the relationship between ACEs and employment status. We believe this is the first study to measure the association between ACEs and perceived job opportunities.

This study builds on the growing research assessing adversities related to the community or environment in which one grows up. Thirty seven percent of adults reported that during their youth they saw someone shot or stabbed and 21 percent did not feel safe in their neighborhood or trust their neighbors.

Without a buffering, protective adult relationship, ACEs, the community adversities, and other negative experiences in childhood may lead to toxic stress which can impact learning behaviors, increase the adoption of risky health behaviors, and ultimately have a negative impact on health outcomes in adulthood.

Given the prevalence of ACEs in Shelby County, the findings from this report suggest a need to advocate for and inform policies and programs to

prevent ACEs for Shelby County youth. The findings also suggest the need for programs and policies for both youth and adults to reduce or prevent the impact of ACEs on risky health behaviors, health outcomes, and job opportunities.

One key to preventing and reducing the impact of ACEs are safe, stable and nurturing relationships between parents or caregivers and children. The Centers for Disease Control and Prevention suggests the following strategies to address the needs of children and their families:

- Home visiting to pregnant women and families with newborns,
- Parent support programs for teens and teen pregnancy prevention programs,
- Parenting training programs,
- Mental illness and substance abuse treatment,
- Intimate partner violence prevention,
- Preschool enrichment,
- Social support for parents, and
- Sufficient income support for lower income families.^{xv}

Preventing ACEs and reducing their impact will enhance the health and wellbeing of residents of Shelby County.



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PHMC Porter-Leath ACE Survey, Shelby County, Revised 8/25/14**INTRODUCTION:**

Intro1 Hello, this is _____ calling on behalf of a Collaboration of Baptist Memorial Hospital for Women, Knowledge Quest and Porter-Leath.

(IF THE R ASKS ABOUT KNOWLEDGE QUEST AND PORTER-LEATH PLEASE RESPOND: Knowledge Quest and Porter-Leath are non-profit organizations in Memphis that provides needed social services to at-risk children and families.)

(ASK IF LANDLINE SAMPLE)

(P.N.-SET 'MALE/FEMALE' AS AN ADJUSTABLE RATIO)

(Added 07/14/14)

Q1.1. May I please speak with the (Male/Female) 18 or older living in this household?

- | | | |
|---|----------------------------|---------------------|
| 1 | Yes, respondent on phone | (CONTINUE) |
| 2 | Respondent coming to phone | (REPEAT INTRO) |
| 3 | Respondent not available | (CONTINUE) |
| 4 | Refused | (PLEASE CODE AS S1) |

(ASK ALL)

(P.N. – SHOW CODE "L Less than 18" ONLY IF CELLPHONE SAMPLE)

Q1. (AGE SCREEN) Can I confirm that you are 18 or older?

(PN: SHOW ONLY IF LANDLINE: IF RESPONDENT IS NOT 18 OR OLDER ASK: May I please speak to someone 18 or older?)

- | | | |
|---|----------------------------|--------------------|
| 1 | Yes, respondent on phone | (CONTINUE) |
| 2 | Respondent coming to phone | (REPEAT INTRO) |
| 3 | Respondent not available | (SET UP CALL BACK) |
| L | Less than 18 | (THANK AND TERM) |

4 Refused (PLEASE CODE AS S1)

(ASK CELL1 IF CELL PHONE SAMPLE ONLY)

CELL1. Before we continue, are you driving or doing anything that requires your full attention right now?

- 1 Yes, respondent is driving/doing something SET UP CALLBACK
- 2 No, respondent is not driving/doing something GO TO Q2
- 9 Refused (THANK AND TERMINATE)

(ASK ALL)

Q2. (COUNTY)First of all, in which county is your household located?

(DO NOT READ)

- 1 Shelby
- 2 Other (THANK AND TERMINATE)
- D (DO NOT READ)Don't know (THANK AND TERMINATE)
- R (DO NOT READ)Refused (THANK AND TERMINATE)

(ASK ALL)

Q3. (ZIPCODE)And, what is the five-digit zip code at your home address where you live?

(IF NECESSARY: This just helps us group neighborhoods together.)

_____ (ENTER 5 DIGITS AND ALLOW FOR LEADING '0')

- D (DO NOT READ)Don't know
- R (DO NOT READ)Refused

(ASK IF Q3 IS NON-SHELBY COUNTY ZIP CODE)

Q3.1 Just to confirm, do you live in Shelby County?

- 1 Yes
- 2 No (THANK AND TERMINATE)
- D (DO NOT READ)Don't know (THANK AND TERMINATE)

R (DO NOT READ)Refused (THANK AND TERMINATE)

(ASK IF Q3.1 = 1)

Q3.2(ZIPCODE2) Please confirm the five-digit zip code at your home address where you live?

(IF NECESSARY: This just helps us group neighborhoods together.)

_____ (ENTER 5 DIGITS AND ALLOW FOR LEADING '0')

N (DO NOT READ) Other

D (DO NOT READ)Don't know

R (DO NOT READ)Refused

PN: IF R PROVIDES ZIP CODE OUTSIDE OF THE VALID RANGE OF ZIP CODES, PLEASE DISPLAY THE FOLLOWING TEXT:

"INTERVIEWER NOTE: ZIP CODE IS OUT OF RANGE. IF THE R INISITS THEY LIVE IN SHELBY COUNTY, PLEASE CODE IT AS 'Other' IN QUESTION 3.2"

(ASK IF Q.3 = D OR R OR Q3.2 = N, D, R)

Q4. (MEMPHIS) Do you live within the city of Memphis, or somewhere else in Shelby County?

1 Memphis

2 Not in Memphis

D (DO NOT READ)Don't Know (THANK AND TERMINATE)

R (DO NOT READ)Refused (THANK AND TERMINATE)

Intro 2. Baptist Memorial Hospital for Women, Knowledge Quest, and Porter-Leath in Memphis are working together on this study. These organizations provide needed social services to at-risk children and families. We appreciate you sharing your experiences. This information will allow us to better understand problems that may occur early in life, and may help others in the future. Let me assure you that your answers will be kept strictly anonymous and will only be used together with the answers from other community residents. Let's get started...

(ASK ALL)

6. (RESPAGE)What is your age please?

_____ (ENTER NUMBER FROM 18-110)

L Less than 18 (THANK AND TERM)

D (DO NOT READ)Don't know

R (DO NOT READ)Refused

(ASK IF Q6=D OR R)

Q6.1. (AGE GROUP)Are you age 18 to 29, 30 to 59, 60 to 74, or 75 or older?

1 18 to 29

2 30 to 59

3 60 to 74

4 75 or older

D (DO NOT READ)Don't know (THANK AND TERMINATE)

R (DO NOT READ)Refused (THANK AND TERMINATE)

Our first question is about your health and well-being.

(ASK ALL)

Q7. (HLTHA5)Would you say that in general your health is excellent, very good, good, fair, or poor?

1 Excellent

2 Very Good

3 Good

4 Fair

5 Poor

D (DO NOT READ)Don't Know

R (DO NOT READ)Refused

The next few questions are about your health and well-being over your ENTIRE lifetime.

Have you EVER been told by a doctor or other health professional that you have or had any of these medical conditions or illnesses?

How about...?

(ASK ALL)

Q8. (HRTATCK)Angina (AN-GINE-UH), coronary heart disease, or a heart attack also called a myocardial infarction (MY-OH-CARD-E-ALL IN-FARC-SHUN)?

1 Yes

2 No

D (DO NOT READ) Don't know

R (DO NOT READ) Refused

(ASK ALL)

Q9. (JAUNLIVR)Yellow jaundice (JAWN-DIS), hepatitis (HEPPA-TIE-TUSS), or any liver trouble?

1 Yes

2 No

D (DO NOT READ) Don't know

R (DO NOT READ) Refused

(ASK ALL)

Q10 (STI)Have you EVER been told by a doctor or other health professional that you had an STD, such as chlamydia (kluh-MID-ee-uh), gonorrhea (gone-uh-REE-uh), syphilis, herpes, genital warts or trichomoniasis (trik-uh-muh-NAI-uh-sis) (also known as Trich)? Do not include HIV or AIDS.

1 Yes

2 No

D (DO NOT READ) Don't know

R (DO NOT READ) Refused

I'd like to ask you some questions about events that happened during your childhood. This information will allow us to better understand problems that may occur early in life, and may help others in the future.

This is a sensitive topic and some people may feel uncomfortable with these questions. At the end of this section, I will give you a phone number for an organization that can provide information and referral for these issues.-Please keep in mind that you can ask me to skip any question you do not want to answer.

All questions refer to the time period before you were 18 years of age. Now, looking back before you were 18 years of age—

(IF NECESSARY: That organization is Lakeside Behavioral Health and their number is 901-377-4733.)

(ASK ALL)

Q11. (FEELSAFE) Did you feel safe in your neighborhood?

(READ LIST)

(IF NECESSARY: While you were growing up, that is during your first 18 years of life...)

(IF RESPONDENT MENTIONS HAVING LIVED IN MULTIPLE NEIGHBORHOODS WHILE GROWING UP ASK: Overall, did you feel safe in the neighborhoods you grew up in?)

- 1 All of the time
- 2 Most of the time
- 3 Some of the time, or
- 4 None of the time
- D (DO NOT READ) Don't know
- R (DO NOT READ) Refused

(ASK ALL)

Q12. (LOOKOUT) Did you feel people in your neighborhood looked out for each other, stood up for each other, and could be trusted? (READ LIST, IF NECESSARY)

(IF NECESSARY: While you were growing up, that is during your first 18 years of life...)

(IF RESPONDENT MENTIONS HAVING LIVED IN MULTIPLE NEIGHBORHOODS WHILE GROWING UP ASK: Overall, did you feel people in the neighborhoods you grew up in looked out for each other...?)

- 1 All of the time
- 2 Most of the time
- 3 Some of the time, or
- 4 None of the time
- D (DO NOT READ) Don't know

R (DO NOT READ) Refused

(ASK ALL)

Q13. (BULLIED)How often were you bullied by a peer or classmate?

(READ LIST, IF NECESSARY)?

(IF NECESSARY: While you were growing up, that is during your first 18 years of life...)

1 All of the time

2 Most of the time

3 Some of the time, or

4 None of the time

D (DO NOT READ) Don't know

R (DO NOT READ) Refused

The next questions are about how often, when you were a child, YOU may have seen or heard certain things in your NEIGHBORHOOD OR COMMUNITY-not in your home or on TV, movies, or the radio. When you were growing up, during the first 18 years of your life...

(ASK ALL)

Q14. (SAWBEAT)How often, if ever, did you see or hear someone being beaten up in real life?

Would you say

(READ LIST)?

1 Many times

2 A few times

3 Once, or

4 Never

D (DO NOT READ) Don't know

R (DO NOT READ) Refused

(ASK ALL)

Q15. (SAWSHOT)How often, if ever, did you see or hear someone being stabbed or shot in real life?
Would you say

(READ LIST)?

- 1 Many times
- 2 A few times
- 3 Once, or
- 4 Never
- D (DO NOT READ) Don't know
- R (DO NOT READ) Refused

Now please think about your childhood, in general, not just your neighborhood or community.

(ASK ALL)

Q16. (FEELSPCL)Did you often or very often feel that no one in your family loved you or thought you were important or special?

(IF NECESSARY: While you were growing up, during your first 18 years of life.

- 1 Yes
- 2 No
- D (DO NOT READ) Don't know
- R (DO NOT READ) Refused

(ASK ALL)

Q17.(NOSUPPORT)Did you often or very often feel that your family didn't look out for each other, feel close to each other, or support each other?

(IF NECESSARY: While you were growing up, during your first 18 years of life.

- 1 Yes
- 2 No
- D (DO NOT READ) Don't know
- R (DO NOT READ) Refused

(ASK ALL)

Q18 (CUTMEAL3) Did your family sometimes cut the size of meals or skip meals because there was not enough money in the budget for food?

(IF NECESSARY: While you were growing up, during your first 18 years of life.

- 1 Yes
- 2 No
- D (DO NOT READ) Don't know
- R (DO NOT READ) Refused

Sometimes people are treated badly, not given respect, or are considered inferior because of the color of their skin, because they speak a different language or have an accent, or because they come from a different country or culture.

(ASK ALL)

Q19. (DISCRIM) While you were growing up during your first 18 years of life how often did you feel that you were treated badly or unfairly because of your race or ethnicity? Would you say...?

(READ LIST)

- 1 Very often
- 2 Often
- 3 Sometimes
- 4 Rarely, or
- 5 Never
- D (DO NOT READ) Don't know
- R (DO NOT READ) Refused

Again, I want to remind you that the next questions refer to the time period while you were growing up in your first 18 years of life. During your first 18 years of life:

(ASK ALL)

Q20. (FOSTER) Were you ever in foster care?

(IF NECESSARY: during your first 18 years of life)?

- 1 Yes

- 2 No
- D (DO NOT READ) Don't know/Not Sure
- R (DO NOT READ) Refused

(ASK ALL)

Q21. (LIVDPRSD) Did you live with anyone who was depressed, mentally ill, or suicidal?

- 1 Yes
- 2 No
- D (DO NOT READ) Don't know/Not Sure
- R (DO NOT READ) Refused

(ASK ALL)

Q22. (LIVALCHL) Did you live with anyone who was a problem drinker or alcoholic

(IF NECESSARY: during your first 18 years of life)?

- 1 Yes
- 2 No
- D (DO NOT READ) Don't know/Not Sure
- R (DO NOT READ) Refused

Still looking back to your first 18 years of life...

(ASK ALL)

Q23. (LIVDRUG) Did you live with anyone who used illegal street drugs or who abused prescription medications?

- 1 Yes
- 2 No
- D (DO NOT READ) Don't know/Not Sure
- R (DO NOT READ) Refused

(ASK ALL)

Q24. (LIVPRISN) Did you live with anyone who served time or was sentenced to serve time in a prison, jail, or other correctional facility?

- 1 Yes
- 2 No
- D (DO NOT READ) Don't know/Not Sure
- R (DO NOT READ) Refused

Sometimes physical blows occur between parents or other adults in the house. While you were growing up, that is during your first 18 years of life...

(ASK ALL)

- Q25. (IPVVERB)How often, if ever, did you see or hear a parent, step parent or another adult who was helping to raise you being yelled at, screamed at, sworn at, insulted or humiliated? Would you say...(READ LIST)

(IF NECESSARY: While you were growing up, that is during your first 18 years of life...)

- 1 Many times
- 2 A few times
- 3 Once, or
- 4 Never
- D (DO NOT READ) Don't know/Not Sure
- R (DO NOT READ) Refused

(ASK ALL)

- Q26. (IPVPHYS)How often did your parents or adults in your home ever slap, hit, kick, punch, or beat each other up?

(IF NECESSARY: While you were growing up, that is during your first 18 years of life...)

- 1 Never
- 2 Once
- 3 More than once
- D (DO NOT READ) Don't know / Not sure
- R (DO NOT READ) Refused

Sometimes parents spank their children as a form of discipline. While you were growing up during your first 18 years of life...

(ASK ALL)

Q27. (SPANK)How often were you spanked?

(IF NECESSARY: While you were growing up, that is during your first 18 years of life...)

- 1 Never
- 2 Once or twice
- 3 A few times a year
- 4 Many times a year
- 5 weekly or more
- D (DO NOT READ) Don't know / Not sure
- R (DO NOT READ) Refused

Sometimes parents or other adults hurt children.

(ASK ALL)

Q28. (PHYSABUS)Before age 18, how often did a parent or adult in your home ever hit, beat, kick, or physically hurt you in any way? Do not include spanking. Would you say---

- 1 Never
- 2 Once
- 3 More than once
- D (DO NOT READ) Don't know / Not sure
- R (DO NOT READ) Refused

(ASK ALL)

Q29. (VERBABUS) How often did a parent or adult in your home ever swear at you, insult you, or put you down?

- 1 Never
- 2 Once

- 3 More than once
- D (DO NOT READ) Don't know / Not sure
- R (DO NOT READ) Refused

(ASK ALL)

Q30. (THRTABUS)How often did a parent or adult in your home ever act in a way that made you afraid that you would be physically hurt? (READ LIST)

- 1 Never
- 2 Once
- 3 More than once
- D (DO NOT READ) Don't know/Not Sure
- R (DO NOT READ) Refused

Some people, while growing up in their first 18 years of life, had a sexual experience with an adult or someone at least five years older than themselves. These experiences may have involved a relative, family friend, or stranger.

(ASK ALL)

Q31. (SEXUALLY)How often did anyone at least 5 years older than you or an adult, ever touch you sexually or try to make you touch them sexually?

- 1 Never
- 2 Once
- 3 More than once
- D (DO NOT READ) Don't know/Not Sure
- R (DO NOT READ) Refused

(ASK ALL)

Q32. (FORCESEX)How often did anyone at least 5 years older than you or an adult force you to have sex?

- 1 Never
- 2 Once

- 3 More than once
- D (DO NOT READ) Don't know/Not Sure
- R (DO NOT READ) Refused

Our next few questions are about your sexual relationships and practices. Remember that your answers will be kept strictly confidential. When we talk about a sex partner, we mean any person, male or female, with whom you had sex, even if it was just once. By sex, we mean oral sex, vaginal sex, or anal sex. The next questions are about your VOLUNTARY sex experiences.

(ASK ALL)

Q33. (SEXAGE) How old were you the first time you had sex?

_____ (ENTER NUMBER FROM 0-110)

- N (DO NOT READ) Never had sex
- D (DO NOT READ) Don't know
- R (DO NOT READ) Refused

(ASK IF Q33=0-110, D, R)

Q34. (SEXPART) How many different sex partners have you ever had? Remember, we are talking about people you had oral, vaginal or anal sex with. If you don't know the exact number, please give your best estimate.

_____ (ENTER NUMBER FROM 1-100)

- 101 More than 100
- D (DO NOT READ) Don't know
- R (DO NOT READ) Refused

ASK IF 34=D OR R

Q34.1. (SEXPART2) I am going to read some ranges. You can just stop me when I get to the right category.

Can you tell me if you have had:

- 1 Five or fewer

2 Six to ten

3 Eleven to 29, or

4 Thirty or more sexual partners

D (DO NOT READ) Don't know

R (DO NOT READ) Refused

Now, a few questions about various personal health behaviors.

(ASK ALL)

Q35. (EVRSMOKE) Have you smoked at least 100 cigarettes in your entire life?

1 Yes

2 No

D (DO NOT READ) Don't Know

R (DO NOT READ) Refused

(ASK IF Q35=1)

Q36. (SMOKE) Do you NOW smoke cigarettes every day, some days or not at all?

1 Every day

2 Some days

3 Not at all

D (DO NOT READ) Don't know

R (DO NOT READ) Refused

For the next two questions, please think about the past 30 DAYS

(ASK ALL)

Q37. (DRINK1) During the past thirty days, on how many different days did you have more than one alcoholic drink, including beer, wine, liquor or a mixed drink?

_____ (ENTER NUMBER FROM 0 to 30)

D (DO NOT READ) Don't Know

R (DO NOT READ) Refused

(ASK IF Q37=1-30)

Q38. (DRINK5) During the past thirty days. On how many different days did you have five or more drinks on the same occasion?

_____ (ENTER NUMBER FROM 0 TO NUMBER GIVEN IN Q.37)

D (DO NOT READ) Don't Know

R (DO NOT READ) Refused

The next question asks about activities over the course of your ENTIRE LIFE.

(ASK ALL)

Q39. (DRUGS) Have you ever used or injected illicit drugs, such as marijuana, cocaine, including crack, hallucinogens, inhalants, heroin, or prescription drugs that were not prescribed for you, including OxyContin (ox-ee-CON-tin), Xanax (ZAN-ax), or Adderall?

1 Yes

2 No

D (DO NOT READ) Don't know

R (DO NOT READ) Refused

The next few questions are about your well-being.

(ASK ALL)

Q40. (DEPRSD) In the past year, have you had two or more weeks of being in a depressed mood, that is feeling down, depressed, or hopeless, or had little interest in doing things?

1 Yes

2 No

D (DO NOT READ) Don't know

R (DO NOT READ) Refused

(ASK ALL)

Q41. (SUICIDE) Have you ever attempted suicide?

1 Yes

2 No

D (DO NOT READ) Don't know

R (DO NOT READ) Refused

DEMOGRAPHICS

The following questions are for classification purposes.

(ASK ALL)

Q42. (SHELBY) Do you feel that you and your family have sufficient job opportunities and educational options in Shelby county?

1 Yes

2 No

D (DO NOT READ) Don't know

R (DO NOT READ) Refused

Q41.1 Now I'd like to ask a few questions about your household: How many adults, age 18 or older, live in your household? Please be sure to include yourself.

_____ (Enter range from 1-15)

16 16 or more

RR (DO NOT READ) Refused

Q41.2 How many children under the age of 18 live in your household?

____ (Enter range from 0-15)

DD (DO NOT READ) Don't know

RR (DO NOT READ) Refused

(ASK ALL)

Q46. (RESPEMPL) Which of the following best describes your current employment situation?

- 01 Employed full-time
- 02 Employed part-time
- 03 Unemployed but looking for work
- 04 Unemployed and not looking for work
- 05 Retired
- 06 Unable to work—disabled
- 07 Homemaker
- 08 Full-time student/Job training
- D (DO NOT READ)Don't Know
- R (DO NOT READ)Refused

(ASK ALL)

Q43. (MAINWAGE)Are you the MAIN wage earner or person with the highest income for your family?

- 1 Yes
- 2 No
- D (DO NOT READ)Don't know
- R (DO NOT READ)Refused

(ASK IF Q43=2)

Q44. (MAINEMPL) Which of the following best describes the main wage earner's current employment situation: Is he or she.... (READ LIST)

- 01 Employed full-time
- 02 Employed part-time
- 03 Unemployed but looking for work
- 04 Unemployed and not looking for work
- 05 Retired
- 06 Unable to work—disabled

07 Homemaker

D (DO NOT READ) Don't know

R (DO NOT READ) Refused

P.N. PLEASE CREATE 'MWEEMPL' VARIABLE.

If Q43=1,D,R MWEEMPL=Q46.

If Q43=2 MWEEMPL=Q44.

(ASK ALL)

Q45. (RSPGRAD2) What was the last grade of school that you completed?

- 1 Less than high school graduate (0 to 11 years)
 - 2 High school graduate (grade 12 or GED certificate)
 - 3 Technical, trade or vocational school AFTER high school
 - 4 Some college, no four-year degree (includes Associates degree)
 - 5 College graduate (B.S., B.A., or other four-year degree)
 - 6 Post-graduate or professional schooling after college (e.g., toward a Master's degree or Ph.D; law or medical school)
- D (DO NOT READ) Don't know
- R (DO NOT READ) Refused

(ASK ALL)

Q47. (RESPHIS) Are you of Hispanic or Latino origin or descent?

- 1 Yes
 - 2 No
- D (DO NOT READ) Don't know
- R (DO NOT READ) Refused

(ASK ALL)

Q48. (RESPRACE) Which one of these groups would you say best represents your race?

(READ LIST)

(If Respondent selects “Something Else” READ : “There may not be a perfect choice in this list but please select which one of these groups you would say best represents your race [RE-READ all response categories] IF RESPONDENT IS NOT ABLE TO SELECT ONE OF THE AVAILABLE CATEGORIES SELECT CODE 97 AND SPECIFY]

- 1 White
- 2 Black or African American
- 3 Asian or Pacific Islander
- 4 American Indian or Alaska Native
- 5 Biracial or Multiracial or
- 97 Something else? (SPECIFY)
- 07 (DO NOT READ) Hispanic/Latino
- D (DO NOT READ) Don’t know
- R (DO NOT READ) Refused

(ASK IF Q.47 = 1 AND Q.48 = 7)

Q49. (WLBLADLT)Are you White Hispanic/Latino or Black Hispanic/Latino?

- 1 White Hispanic/Latino
- 2 Black Hispanic/Latino
- 7 (DO NOT READ) Other
- D (DO NOT READ) Don’t know
- R (DO NOT READ) Refused

(ASK ALL)

Q5. (SEXASK)What is your gender or sex?

(DO NOT READ)

- 1 Male

- 2 Female
- 3 Transgender
- 4 Biological intersex at birth
- 5 Something else
- D (DO NOT READ)Don't Know
- R (DO NOT READ)Refused

(ASK ALL)

Q50. (**INCOME**A)Which of the following income categories best describes your total 2013 family income? Please include income from anyone living at this address who is related to you by blood, marriage, or adoption. Also, please be sure to include income from all sources, such as wages, salaries, welfare, social security, retirement benefits, investments, alimony and/or child support.

Is your total family income (READ LIST)?'

- 1 Less than \$17,000
- 2 At least \$17,000 but less than \$35,000
- 3 At least \$35,000 but less than \$60,000
- 4 \$60,000 or more
- D (DO NOT READ)Don't Know
- R (DO NOT READ)Refused

(ASK Q50=1)

Q50a. (**INCOME**11)Can you tell me if your total 2013 family income was under 11 thousand five hundred or 11 thousand five hundred or more?

- 1 Under 11 thousand five hundred
- 2 11 thousand five hundred or more
- D (DO NOT READ)Don't Know
- R (DO NOT READ)Refused

(ASK IF Q.50=2)

Q50b. (INCOME27)Can you tell me if your total 2013 family income was under 27 thousand six hundred or 27 thousand six hundred or more?

- 1 Under 27 thousand six hundred
- 2 27 thousand six hundred or more
- D (DO NOT READ)Don't Know
- R (DO NOT READ)Refused

(ASK IF Q.50=3)

Q50c. (INCOME47)Can you tell me if your total 2013 family income was under 47 thousand two hundred or 47 thousand two hundred or more?

- 1 Under 47 thousand two hundred
- 2 47 thousand two hundred or more
- D (DO NOT READ)Don't Know
- R (DO NOT READ)Refused

(ASK IF Q.50=4)

Q50d. (INCOM100)Can you tell me if your total 2013 family income was under one hundred thousand or one hundred thousand or more?

- 1 Under 100 thousand
- 2 100 thousand or more
- D (DO NOT READ)Don't Know
- R (DO NOT READ)Refused

(ASK Q.50.1 IF Q.50a = 1,2, OR Q.50b=1,2 OR Q.50c=1,2 OR q.50d=1,2)

SHOW CODES 01-04, DD, RR IF Q.50a = 1

SHOW CODES 05-08, DD, RR IF Q.50a = 2

SHOW CODES 09-13, DD, RR IF FQ.50b = 1

SHOW CODES 014-16, DD, RR IF Q.50b = 2

SHOW CODES 17-19, DD, RR IF Q.50c = 1

SHOW CODES 20-23, DD, RR IF Q.50c = 2

SHOW CODES 24-26, DD, RR IF FQ.50d = 1

SHOW CODES 27-29, DD, RR IF FQ.50d = 2

Q50f. (INCOME) Please stop me when I get to the correct category. Is that... ?

(READ LIST. ENTER ONE ONLY)

(INTERVIEWER - IF RESPONDENT IS NOT SURE PLEASE SPECIFY THAT WE ARE ONLY
LOOKING FOR THEIR BEST GUESS)

- 01 Less than \$5,500
- 02 \$5,500 to under \$7,400
- 03 \$7,400 to under \$9,300
- 04 \$9,300 to under \$11,500
- 05 \$11,500 to under \$13,100
- 06 \$13,100 to under \$14,900
- 07 \$14,900 to under \$16,400
- 08 \$16,400 to under \$17,000
- 09 \$17,000 to under \$18,700
- 10 \$18,700 to under \$21,900
- 11 \$21,900 to under \$22,400
- 12 \$22,400 to under \$26,200
- 13 \$26,200 to under \$27,600
- 14 \$27,600 to under \$29,700
- 15 \$29,700 to under \$33,700
- 16 \$33,700 to under \$35,000
- 17 \$35,000 to under \$39,300
- 18 \$39,300 to under \$44,840
- 19 \$44,840 to under \$47,200
- 20 \$47,200 to under \$50,800

- 21 \$50,800 to under \$52,400
- 22 \$52,400 to under \$56,500
- 23 \$56,500 to under \$60,000
- 24 \$60,000 to under \$67,700
- 25 \$67,700 to under \$75,000
- 26 \$75,000 to under \$100,000
- 27 \$100,000 to under \$150,000
- 28 \$150,000 to under \$250,000
- 29 \$250,000 or More
- DD (DO NOT READ) Don't Know
- RR (DO NOT READ) Refused

(IF LANDLINE SAMPLE)

- L1 Now thinking about your telephone use. . . Does anyone in your household including yourself, have a working cell phone?
 - 1 Yes respondent or someone else has cell phone in household
 - 2 No
 - 9 (DO NOT READ) Don't know/No answer

(IF CELL PHONE SAMPLE)

- C1 Now thinking about your telephone use, is there at least one telephone INSIDE your home that is currently working and is not a cell phone?
 - 1 Yes, has a home telephone
 - 2 No, no home telephone
 - 9 (DO NOT READ) Don't know/No answer

That was our last question. We appreciate your time and cooperation. Thank you so much. We offer every participant in our research a phone number for an organization that can provide information and

referrals for any of the issues we discussed in this interview. That organization is Lakeside Behavioral Health and their number is 901-377-4733.

Thank you again.

Methodology

Survey Methods

The Shelby County ACE Survey was fielded by Social Science Research Solutions (SSRS), a subcontractor of Public Health Management Corporation, from July 10, 2014 through August 11, 2014.

Potential respondents were invited to participate on behalf of a collaboration between Baptist Memorial Hospital for Women, Knowledge Quest and Porter-Leath, and assured of the anonymity of their responses. Respondents were given the telephone number for Lakeside Behavioral Health for information and referral.

Sample

A total of 1506 respondents were contacted on landlines and cell phones. Qualifying respondents were 18 years of age or older, spoke English or Spanish, and lived in Shelby County, TN.

Table 1: Completed Interviews by Sampling Frame

	Total Interviews	Landline	Cell Phone
Memphis	1,003	607	396
Non-Memphis	503	293	210
Total	1,506	900	606

The random-digit dial landline sample was generated through Marketing Systems Group's (MSG) GENESYS sampling system shortly before the beginning of data collection to provide the most up-to-date sample possible, maximizing the number of valid telephone numbers. Cellphone sample was defined using rate center information. Inactive, non-working and business telephone numbers were eliminated from the sample when possible using MSG's GENESYS ID plus and Cell-WINS procedures.

Survey Questionnaire

The survey questionnaire was developed by PHMC, in consultation with Porter-Leath and SSRS. Questions were modeled on existing items in use in prior studies, including the Philadelphia ACE Study, Behavioral Risk Factor Surveillance System ACE Module and the Kaiser Permanente study.

Fielding

The survey was fielded by interviewers at SSRS using CATI (computer assisted telephone interviewing). Telephone interviewers received written materials about the survey instrument and received formal training for this particular project. The written materials were provided prior to the beginning of the

field period and included an annotated questionnaire that contained information about the goals of the study as well as detailed explanations as to why questions were being asked, the meaning and pronunciation of key terms, potential obstacles to be overcome in getting good answers to questions, and respondent problems that could be anticipated ahead of time, as well as strategies for addressing the potential problems.

Following a pretest of 55 interviews, minor edits were made to the introduction and question order.

A differential call rule was established that required that call attempts be initiated at different times of day and different days of the week.

A table of sample dispositions, provided by SSRS, is below:

Table 2. Survey Dispositions

Eligible, Interview (Category 1)	
Completed interview	1506
Eligible, non-interview (Category 2)	
Refusal and breakoff	74
Break off	196
Language problem	2
Unknown eligibility, non-interview (Category 3)	
Always busy	616
No answer	8123
Answering machine-don't know if household	7194
Housing unit, unknown if eligible respondent	5567
No screener completed	526
Not eligible (Category 4)	
Fax/data line	1371
Non-working number	46349
Business, government office, other organizations	1094
No eligible respondent	1121
Total phone numbers used	73738
AAPOR Response Rate 3	23%

Weighting

The data were weighted to adjust for variation in individual probabilities of selection based on reachability on multiple telephone numbers (cell and landline), to account for geographic targets (Memphis versus non-Memphis) and then raked through iterative proportional fitting to match the marginal distribution of population parameters (gender, age, education, race and region).

Design effect for the PHMC ACE Survey of Shelby County, TN was 1.78 overall. Accounting for sample size and design effect, the conservative margin of sampling error for this study was $\pm 3.4\%$, for questions with two response options and an equal distribution of responses.

Table 3. Weighted and Unweighted Sample Distributions and Population Parameters

	Unweighted	Weighted	Target
Gender			
Male	35.3%	45.4%	46.2%
Female	63.3%	53.5%	53.8%
Age			
18-29	10.2%	21.4%	23.1%
30-59	43.8%	55.1%	55.2%
60-74	31.1%	16.8%	15.6%
75+	14.9%	6.7%	6.1%
Race			
Hispanic	3.3%	4.9%	4.9%
White Non-Hispanic	45.0%	41.5%	42.0%
Black Non-Hispanic	42.9%	48.7%	50.3%
Other Non-Hispanic	6.4%	3.1%	2.8%
Education			
Less Than High School	9.5%	12.6%	13.7%
High School	27.3%	27.7%	28.0%
Some College	28.0%	31.8%	32.1%
College	33.7%	26.9	26.2%
Geography			
Memphis	66.6%	69.0%	69.3%
Non-Memphis	33.4%	31.0%	30.7%

Data Cleaning and Analysis

Data were cleaned and analyzed using SPSS software. ACE indicators were recoded into dichotomous variables reflecting whether the respondent experienced each adverse experience. In cases where a respondent indicated “don’t know” or “not sure” to any of the ACE or community ACE questions, the ACE category was defined as a negative response. We excluded from the logistic regression analysis any respondents whose race was unstated, educational attainment was not reported, or did not answer (i.e. refused or missing) questions the conventional adverse childhood indicators.

ACE Classification

The ACE questions that were used to compare with the Tennessee BRFSS ACE findings and used in the regression analysis were taken from the ACE module used in the BRFSS surveillance system¹. These nine questions yielded two categories (i.e., Abuse and Household Dysfunction) and seven indicators of ACEs (i.e., emotional or verbal abuse, physical abuse, sexual abuse, household domestic violence, household substance abuse, household mental illness, and incarcerated family members). The ACE questions about neglect were adapted from the Kaiser ACE study and from USDA research on food insecurity. The ACE questions about community adversities were developed by the Philadelphia ACE Task Force and were adapted from the California Health Interview Survey Adult Questionnaire; the Adverse Childhood Experiences International Questionnaire; the National Survey on Children’s Exposure to Violence, and the Centers for Disease Control and Prevention Family Health History and Health Appraisal questionnaire.

Respondents were told that the ACE questions referred to their first 18 years of life.

Fewer than 1% responded “don’t know or not sure” to any of the Abuse or Household Dysfunction ACE questions, which was defined as a negative response for that ACE category. Any respondents whose race was unstated, educational attainment was not reported, or who did not respond to one or more of the questions that make up the Abuse or Household Dysfunction categories of ACEs, were excluded from the regression model. Table 5 details the differences in ACE indicators between the Shelby County study, the BRFSS Survey and the original Kaiser study.

¹ The questions asked on the BRFSS ACE module were adapted from the Kaiser ACE study questions to conform to fewer BRFSS question response categories. The questions were tested for understanding using focus groups.

Table 4. ACE Categories, Shelby County

ACE Category		Population Percent
Abuse	Physical abuse	14.4%
	Emotional abuse	23.4%
	Sexual abuse	19.5%
Household Dysfunction	Household member in prison	11.9%
	Mentally ill household member	13.1%
	Substance abusing household member	25.0%
	Violence between adults	21.7%
Neglect	Emotional neglect	25.1%
	Physical neglect	19.0%
Community Adversities	Saw someone beaten	60.1%
	Saw someone shot or stabbed	36.9%
	Experienced discrimination	12.7%
	Bullied	41.4%
	Neighborhood not safe, neighbors not trusted	20.9%
ACE Score	0 ACEs	47.7%
	1 ACE	19.9%
	2-3 ACEs	20.5%
	4 or more ACEs	11.9%

Appendix B. Methodology

ACE Indicator Comparison

ACE Indicator Comparison			
Shelby County ACE		BRFSS ACE	Kaiser ACE
ABUSE			
Emotional Abuse	How often did a parent or adult in your home ever swear at you, insult you, or put you down?	How often did a parent or adult in your home ever swear at you, insult you, or put you down?	Did a parent or other adult in the household often or very often swear at, insult, or put you down?
			Did a parent or other adult in the household often or very often act in a way that made you afraid that you would be physically hurt?
ACE	More than once	More than once	“Yes” to either of the above two questions
Physical Abuse	Before age 18, how often did a parent, or adult in your home ever hit, beat, kick, or physically hurt you in any way? Do not include spanking.	How often did your parents or an adult in your home ever hit, beat, kick or physically hurt you in any way? Do not include spanking.	Did a parent or other adult in the household often or very often push, grab, shove, or slap you?
			Did a parent or other adult in the household often or very often hit you so hard that you had marks or were injured?
ACE	More than once	More than once	“Yes” to either of the above two questions
Sexual Abuse	How often did anyone at least 5 years older than you or an adult ever force you to have sex?	How often did anyone at least 5 years older than you or an adult ever force you to have sex?	Did an adult or person at least 5 years older attempt oral, anal, or vaginal intercourse with you?
	How often did anyone at least 5 years older than you or an adult ever touch you sexually or try to make you touch them sexually?	How often did anyone at least 5 years older than you or an adult ever touch you sexually?	Did an adult or person at least 5 years older actually have oral, anal, or vaginal intercourse with you?
		How often did anyone at least 5 years older than you or an adult try to make you touch them sexually?	Did an adult or person at least 5 years older ever touch or fondle you in a sexual way?
			Did an adult or person at least 5 years older have you touch their body in a sexual way?
ACE	More than once or once to any of the above two questions	More than once or once to any of the above three questions	“Yes” to any of the above questions
NEGLECT			
Emotional Neglect	Did you often or very often feel that no one in your family loved you or thought you were important or special?	Not Asked	Did you often or very often feel that no one in your family loved you or thought you were important or special?
	Did you often or very often feel that your family didn’t look out for each other, feel close to each other, or support each other?		Did you often or very often feel that your family didn’t look out for each other, feel close to each other, or support each other?

Appendix B. Methodology

	Shelby County ACE	BRFSS ACE	Kaiser ACE
ACE	“Yes” to either of the above two questions		“Yes” to either of the above two questions
Physical Neglect	Did your family sometimes cut the size of meals or skip meals because there was not enough money in the budget for food?	Not Asked	Did you often or very often feel that you didn’t have enough to eat, had to wear dirty clothes, and had no one to protect you?
			Did you often or very often feel that your parents were too drunk or high to take care of you or take you to the doctor if you needed it?
ACE	"Yes"		“Yes” to either of the above two questions
Household Dysfunction			
Domestic Violence	How often did your parents or adults in your home ever slap, hit, kick, punch, or beat each other up?	How often did your parents or adults in your home ever slap, hit, kick, punch, or beat each other up?	Was your mother or stepmother sometimes, often, or very often pushed, grabbed, slapped, or had something thrown at her?
			Was your mother or stepmother sometimes, often, or very often kicked, bitten, hit with a fist, or hit with something very hard?
			Was your mother or stepmother ever repeatedly hit over at least a few minutes?
			Was your mother or stepmother ever threatened with, or hurt by, a knife or gun?
ACE	Once or More than once	Once or More than once	“Yes” to any of the above questions
Household Substance Abuse	Did you live with anyone who was a problem drinker or alcoholic?	Did you live with anyone who was a problem drinker or alcoholic?	Live with anyone who was a problem drinker or alcoholic?
	Did you live with anyone who used illegal street drugs or who abused prescription medications?	Did you live with anyone who used illegal street drugs or who abused prescription medications?	Live with anyone who used street drugs?
ACE	“Yes” to either of the above two questions	“Yes” to either of the above two questions	“Yes” to either of the above two questions
Household Mental Illness	While you were growing up, did you live with anyone who was depressed, mentally ill, or suicidal?	Did you live with anyone who was depressed, mentally ill, or suicidal?	Was a household member depressed or mentally ill?
			Did a household member attempt suicide?
ACE	"Yes"	"Yes"	“Yes” to either of the above two questions
Parental Separation or Divorce	Not Asked	Were your parents separated or divorced?	Were your parents were ever separated or divorced?
		"Yes"	"Yes"
Incarcerated Household Member	Did you live with anyone who served time or was sentenced to serve time in a prison, jail, or other correctional facility?	Did you live with anyone who served time or was sentenced to serve time in a prison, jail, or other correctional facility?	Did a household member go to prison?
ACE	"Yes"	"Yes"	"Yes"