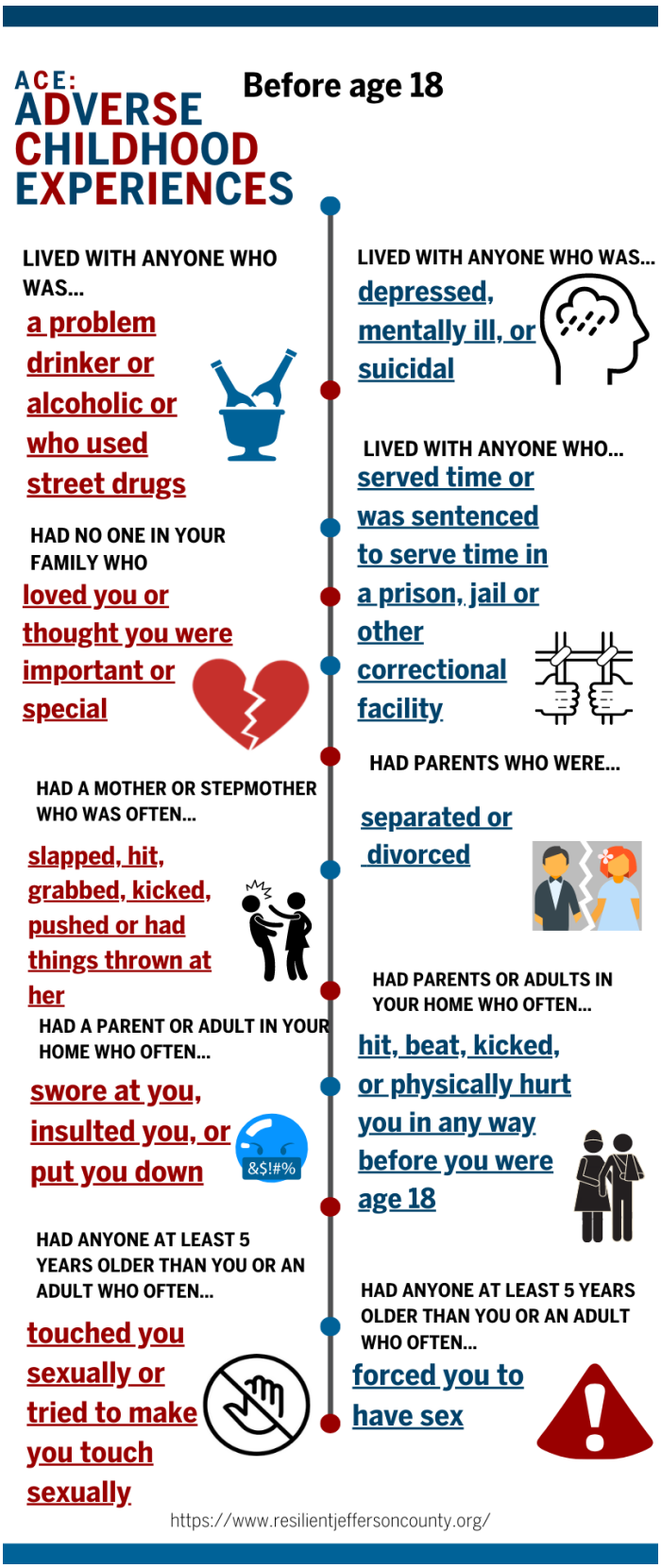
Adverse Childhood Experiences in Jefferson County, Indiana

2021 IU Southeast Sociology Research Lab



Adverse Childhood Experiences (ACEs) are traumatic events experienced from birth through age 17. Research shows that these experiences disrupt neurodevelopment, causing social, emotional, and cognitive impairments that affect behaviors, including health behaviors.[1] These impacts lead to negative outcomes in health, mental health, education, and social success and well being, ultimately resulting in early death.

Jefferson County is home to relatively high rates of smoking, obesity, physical inactivity, poor mental and physical health days, and diabetes. In addition, the county has a far higher suicide rate than the state or nation. Jefferson County has relatively low educational attainment, and the median household income is below the state median. In the face of these challenges, identifying leverage points for improving outcomes is vitally important.

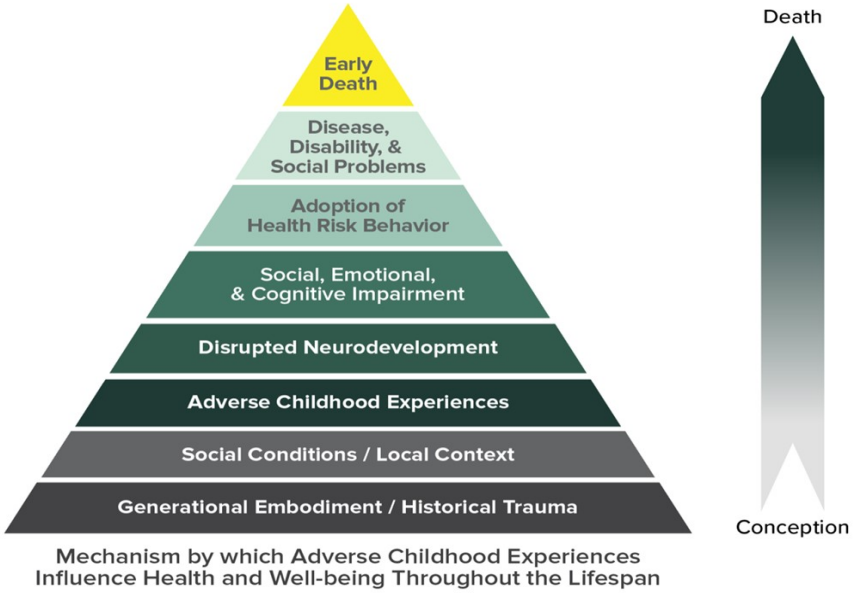
The Jefferson County community-wide ACEs survey is an attempt to document the prevalence of ACEs, draw connections between experiences of childhood trauma and health, mental health, education, and economic outcomes, and identify the highest priorities for prevention and intervention.

Key Findings

Based on a weighted sample:

- The estimated average ACE score for Jefferson County adults is 2.4.
- 30.4% of Jefferson County adults have an ACE score of 4 or higher.
- Roughly 9.7% of Jefferson County adults have an ACE score of 7 or higher.
- More than a third of Jefferson County adults report that before age 18 they experienced one or more of the following: separation or divorce of parents, emotional abuse, or living with someone who suffered from substance use disorder (an alcoholic or drug user).
- 32.2% of Jefferson County adults have no ACEs.

Figure 1: Impact of ACEs Throughout the Lifespan



Source: CDC-Kaiser Health. 2020[1998]. "About the CDC-Kaiser ACE Study." *Violence Prevention* (https://www.cdc.gov/violenceprevention/ACE/about.html).

Research on ACEs

In 1998, Vincent Felitti, Robert Anda, and a team of researchers published a groundbreaking study documenting statistically significant relationships between experiences of seven categories of childhood trauma and health risk behaviors and disease in adulthood.[2] Since that time, dozens of studies have replicated and expanded on the initial findings, confirming consistent relationships between ACEs and negative outcomes in the areas of health, mental health, substance abuse, educational attainment, employment stability, and income. This field of research finds strong dosage effects where those with higher ACE scores experience progressively higher rates of disease and dysfunction in their adult lives. Those with zero reported ACEs have significantly better outcomes than those with four or more ACEs across a range of indicators of adult well-being and predictors of early death.[3]

Sex, Age, Education, & Income

The inclusion of ACEs as part of the Behavioral Risk Factor Surveillance System (BRFSS) has allowed researchers to amass a very large geographically diverse sample of adults from 34 states. While childhood trauma is common across sociodemographic groups, the research suggests that some populations are at risk for higher ACE scores than others.[4]

A majority of American adults (57.8%) experienced at least one childhood trauma and 21.5% experienced 3 or more ACEs.[5] Multiracial individuals have a significantly higher average ACE score (2.4) than all other races and ethnicities, and whites have the lowest average ACE score of the racial categories (1.5).[6] Women have a higher mean ACE score than men (1.6 compared to 1.5), and those age 25-34 report a significantly higher mean ACE score than any other group (2.0).[7]

Those with higher income and educational attainment have lower ACE scores than those with lower income and educational attainment.[8] Research suggests that among the mechanisms by which ACEs produce poorer outcomes in education and employment are the health and mental health outcomes that affect work performance and stability.[9]

Research in Wales suggests the impact of ACEs on educational attainment is largely explained by failure to complete high school.[10] Research indicates that a combination of lower educational attainment and challenges with employment stability explain negative income outcomes for those with higher ACE scores.[11]

Health

Toxic stress is one mechanism by which childhood trauma affects adult health and mental health outcomes. When the body experiences chronic stressors, it remains in a fight or flight mode of vigilance that causes the release of hormones and chemicals that affect neurodevelopment and long-term health outcomes.[12] Chronic stress causes changes to neurobiology that impact early brain development,[13] the immune system,[14] and the endocrine system.[15] Stressful or traumatic experiences often lead to social, emotional, and cognitive deficiencies that increase risk for unhealthy behaviors and chronic disease.[16]

Toxic stress can cause issues with immune and metabolic systems that fight illness, leading to a

lifetime of susceptibility to illness.[17] Toxic stress causes early onset of disease, disability, and premature death.[18] ACE exposure increases risk of obesity.[19] Higher ACE scores are associated with increased risk of smoking, heart disease, chronic lung disease, poor self-rated health, having 50 or more sexual intercourse partners, and sexually transmitted disease (2-4 fold increase in risks).[20] Researchers find a 1.4-1.6 fold increase in physical inactivity and severe obesity among those with 4 or more ACEs compared to those with none.[21] The number of ACEs showed a dose dependent relationship with diseases such as ischemic heart disease, cancer, chronic lung disease, skeletal fractures, and liver disease.[22] Research links ACEs to systemic arterial stiffness among adolescents.[23]

Mental Health and Substance Use Disorder

Childhood trauma increases risk for a range of mental health concerns and for substance use disorder (SUD). Bryant (2020) found that each individual ACE type was significantly associated with SUD.[24] These issues may impact employment stability. Studies find associations between early adversity and each of the following:

- Frequent mental distress.[25]
- Depression.[26]
- Suicide attempts.[27]
- Smoking.[28]
- Alcohol abuse.[29]
- Substance abuse.[30]

In addition, sexual abuse and parental/other family member's mental illness increase the odds for having a suicide attempt for both men and women and emotional neglect is also a factor for men.[31]

While some may understand ACEs as individual level experiences that shape individual outcomes, social connectedness, community, and public policy may play significant roles in preventing and mitigating the impacts of adverse childhood experiences.[32] Moreover, a high prevalence of ACEs results in community level impacts such as lower educational attainment, labor force issues, poor performance in indicators of health and quality of life.

Methods

The Indiana University Southeast Sociology Research Lab and Applied Research and Education Center (AREC) used the Centers for Disease Control's 10-item ACE instrument as the base for the Jefferson County community-wide ACEs survey. Based on the review of the literature, the team asked additional questions to obtain information on adult outcomes found to be associated with ACEs. In addition, the team included demographic questions to allow for comparisons between Jefferson County and national patterns.

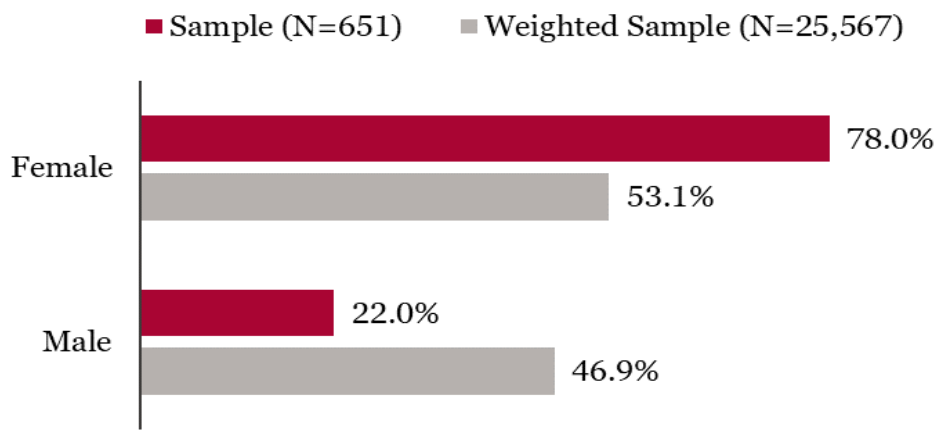
The Indiana University Institutional Review Board reviewed and approved the study design and materials. The survey was made available electronically using Qualtrics survey software. Participants were recruited using email distribution of the link through local nonprofit organizations and other mailing lists using a snowball sampling approach, where recipients were free to share and distribute as they chose. In addition, social media posts encouraged participation and linked to the online survey.

Flyers were posted throughout the county and quarter sheet flyers were distributed via local organizations with a QR code that linked directly to the survey. The QR code also appeared on the survey collection boxes to make the online survey available in all locations where paper surveys were distributed. Paper surveys were made available at 10 sites throughout the community, including both rural and in-town locations, and venues serving low-income and otherwise diverse populations that tend to be underrepresented in online surveys. Spanish language paper surveys were made available in locations serving the Hispanic population and the online survey was available in both English and Spanish. Locked survey boxes were available for survey collection along with business reply envelopes that allowed respondents to mail completed surveys directly to the AREC.

Three surveys were received via direct mail and 46 paper surveys came in through drop boxes. Six hundred and one electronic surveys were completed for a total of 666 surveys. Of those, 642 answered all 10 questions about childhood trauma.

The research team used SPSS 28 to manage and analyze the data. In order to better estimate

Figure 2: Males and Females in Sample and Jefferson County Weighted Sample



Note: Weighted sample reflects county demographics for age, sex, education, and income.

Sample and County Demographics

The convenience sampling strategy produced a large sample, but one that is not representative of the community's demographics. The sample is heavily skewed toward women (Figures 2), under-represents 18-24 year-olds and those over age 65 (Figure 3), over-represents those with higher education (Figure 4), and those from higher income categories (Figure 5).

population figures, the sample was weighted to county population figures for sex, age, income, and education. Cross tabs with appropriate significance tests were used to test group differences, along with t-tests for differences in mean ACE scores across groups.

This report presents basic descriptive analysis for both the actual and weighted samples to ensure transparency around the estimation procedures and to provide a clearer sense of the likely prevalence of ACEs and associated adult outcomes in Jefferson County, Indiana.

Jefferson County is 94.5% White, 2.1% Black, 0.9% Asian, 1.2% two or more races, and 2.8% Hispanic. The sample was 98.9% White and only 1.9% Black and 2.0% Hispanic. The small number of minority responses make weighting for race and Hispanic problematic.

The weighted sample uses responses received and demographics for the county to generate a data set that approximates the full population and its sex, age, education, and income distributions. For example, our sample was 22.0% male (Figure 2); weights for sex generate a sample that matches the

Figure 3: Age

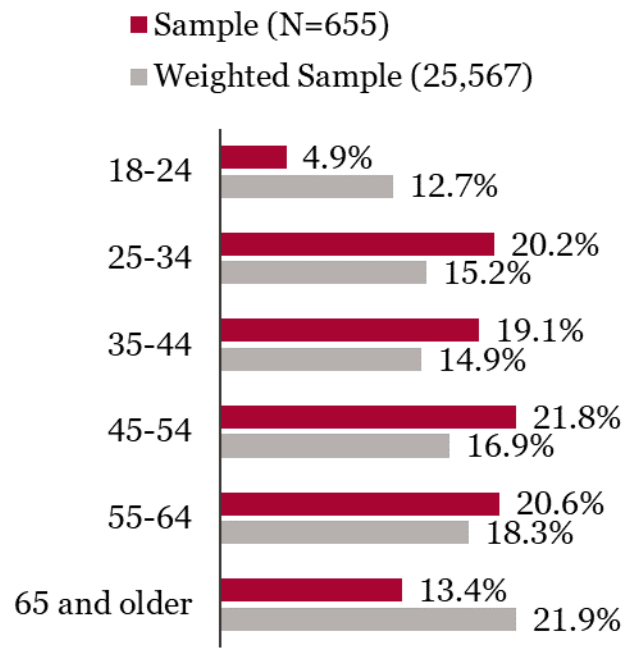


Figure 4: Educational Attainment

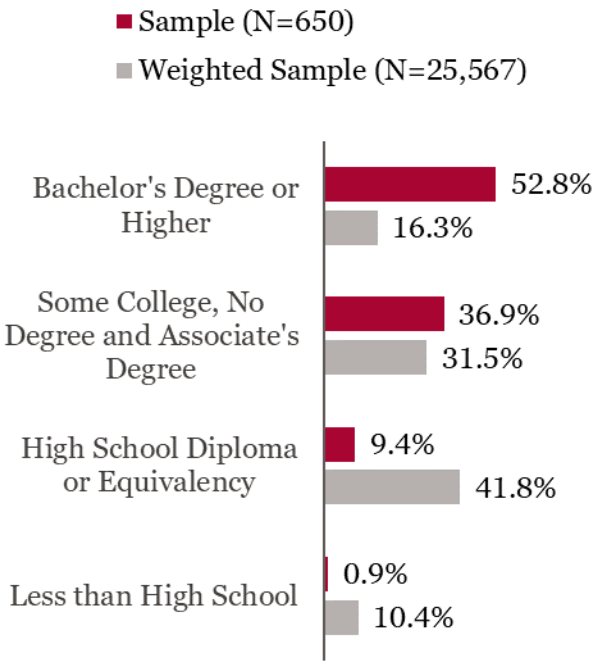
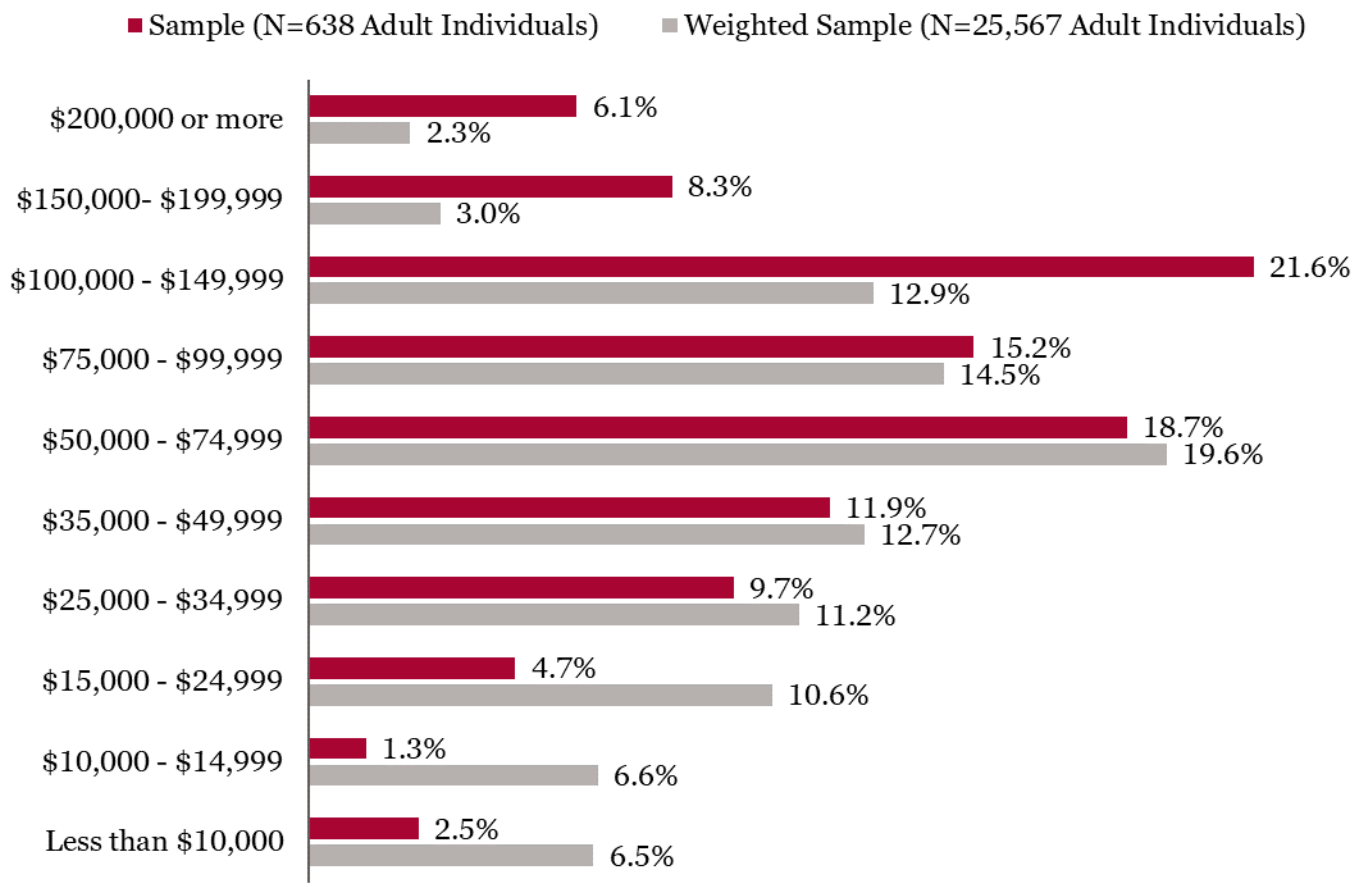


Figure 5: Income Distribution



county sex composition, which is 46.9% male (Figure 2). Because demographics are associated with ACEs, weighting produces a more accurate estimate of the prevalence of ACEs in the County.

Findings

The estimated average ACE score for adults in Jefferson County is 2.4 (SD=2.5) compared to a national mean of 1.6. In total, approximately 32.2% of Jefferson County adults have an ACE score of 0 and 67.7% of respondents have one or more ACEs compared to 57.8% nationally (Figure 7). An estimated 30.3% of Jefferson County adults report four or more ACEs and 9.6% report seven or more ACEs. Women have a significantly higher mean ACE score than men (2.7 compared to 2.1 with a median of 2 for women and 1 for men).

The highest prevalence ACEs are parents divorced or separated (43.1%), emotional abuse & fear for safety (37.0%), living with an alcoholic or drug user (33.6%), and household member mentally ill or attempted suicide (31.8%). The lowest prevalence ACE is household member that ever went to prison at 10.1% compared to 8.1% nationally (Figure 8).

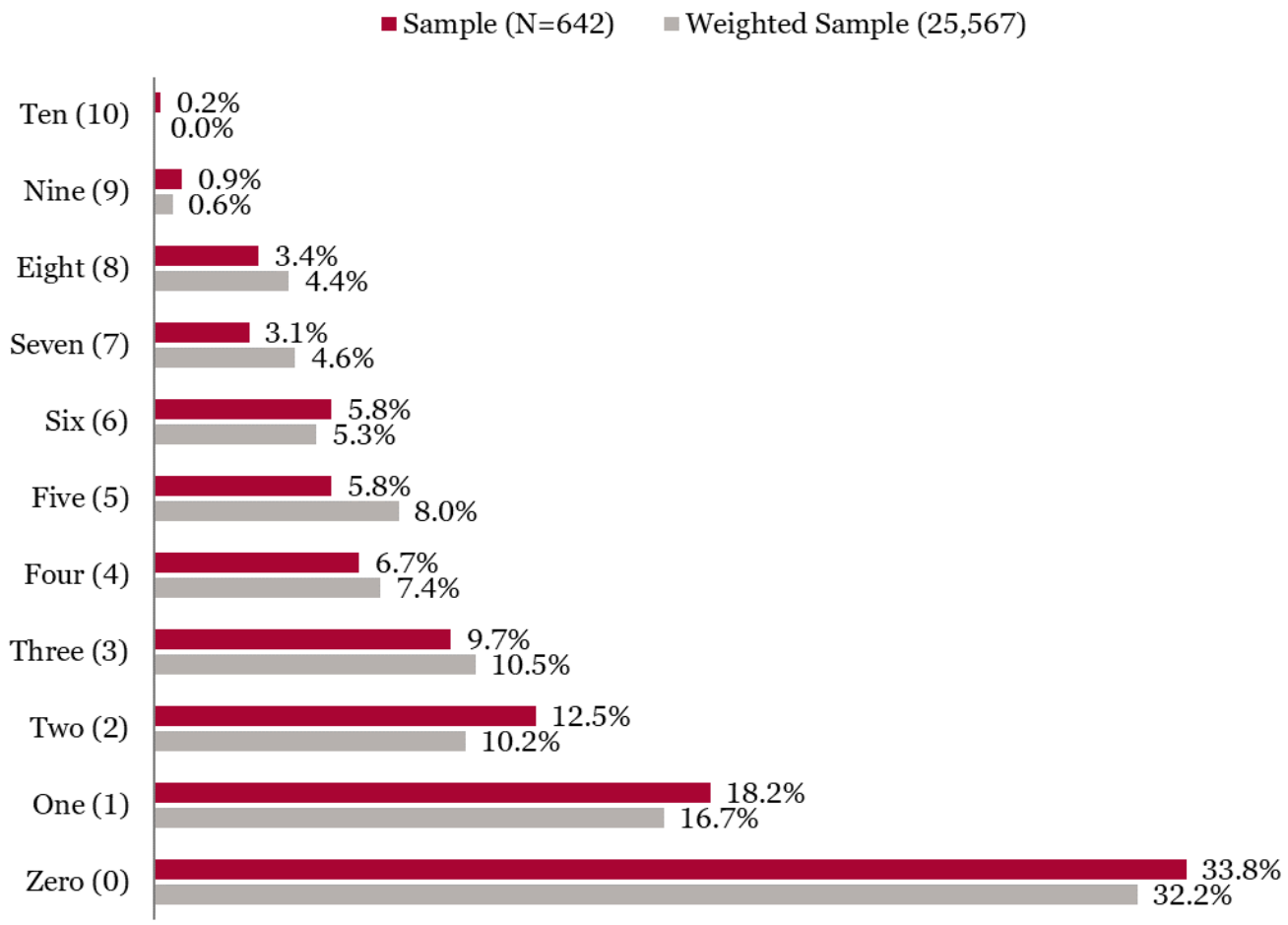
In the Jefferson County weighted sample, educational attainment is significantly associated with ACE scores. Those with four or more ACEs are significantly less likely to have a college degree or higher, are less likely to have a high

Figure 6: Race and Hispanic Ethnicity

	Sample (N=645)	Jefferson County
White alone	97.5%	95.0%
American Indian & Alaska Native alone	0.2%	0.4%
Black alone	.9%	2.2%
Asian alone	0.0%	0.9%
Two or More Races	1.4%	1.6%
Hispanic or Latino/a	2.0%	3.0%

Note: The weighted sample over-represents Whites and Hispanics. Still, the small number of Black and Hispanic responses would make weighting for race and Hispanic origin problematic.

Figure 7: Distribution of ACE Scores in Jefferson County Actual and Weighted Samples



Note: As you read the charts, weighted figures are likely closer to true population rates than sample figures.

school diploma or equivalency, and are more likely to have less than high school (Figure 9). The Jefferson County survey asked respondents if they have ever struggled to maintain consistent employment. Among those who report 4 or more ACEs, 19.2% of the weighted sample reported that they had compared to 10.1% of the weighted sample with zero ACEs. The association is statistically significant (Figure 10, $p<.001$).

Struggles with employment stability for those with higher ACE scores are likely the result of challenges with health, mental health, and substance abuse. When combined with lower educational attainment, these issues yield lower income levels. In the Jefferson County weighted sample the pattern is notable in higher percentages of those with four or more ACEs at lower income levels and lower percentages at the highest income levels than for those with zero ACEs. The significantly lower income levels of those with higher ACE scores makes it more likely that children in their households will also experience chronic stress associated with poverty.

Health, Mental Health, and Substance Abuse

ACEs are associated with poor health behaviors and high risk practices such as smoking and substance use that increase the likelihood of chronic disease and premature death. County Health Rankings data indicate that Jefferson County has higher average numbers of days of poor mental and physical health than the state average. Residents report an average 5.2 poor mental health days per month compared to 4.7 for the state and 3.8 among U.S. top performers, and 4.2 poor physical health days per month compared to 4.0 for the state and 3.4 among U.S. top performers. The county has relatively high rates of smoking (24%), obesity (33%), and physical inactivity (25%).*

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*County Health Rankings round data to whole numbers so we are unable to present figures to the first decimal place.

Figure 8: Prevalence of each ACE in Jefferson County Actual and Weighted Samples

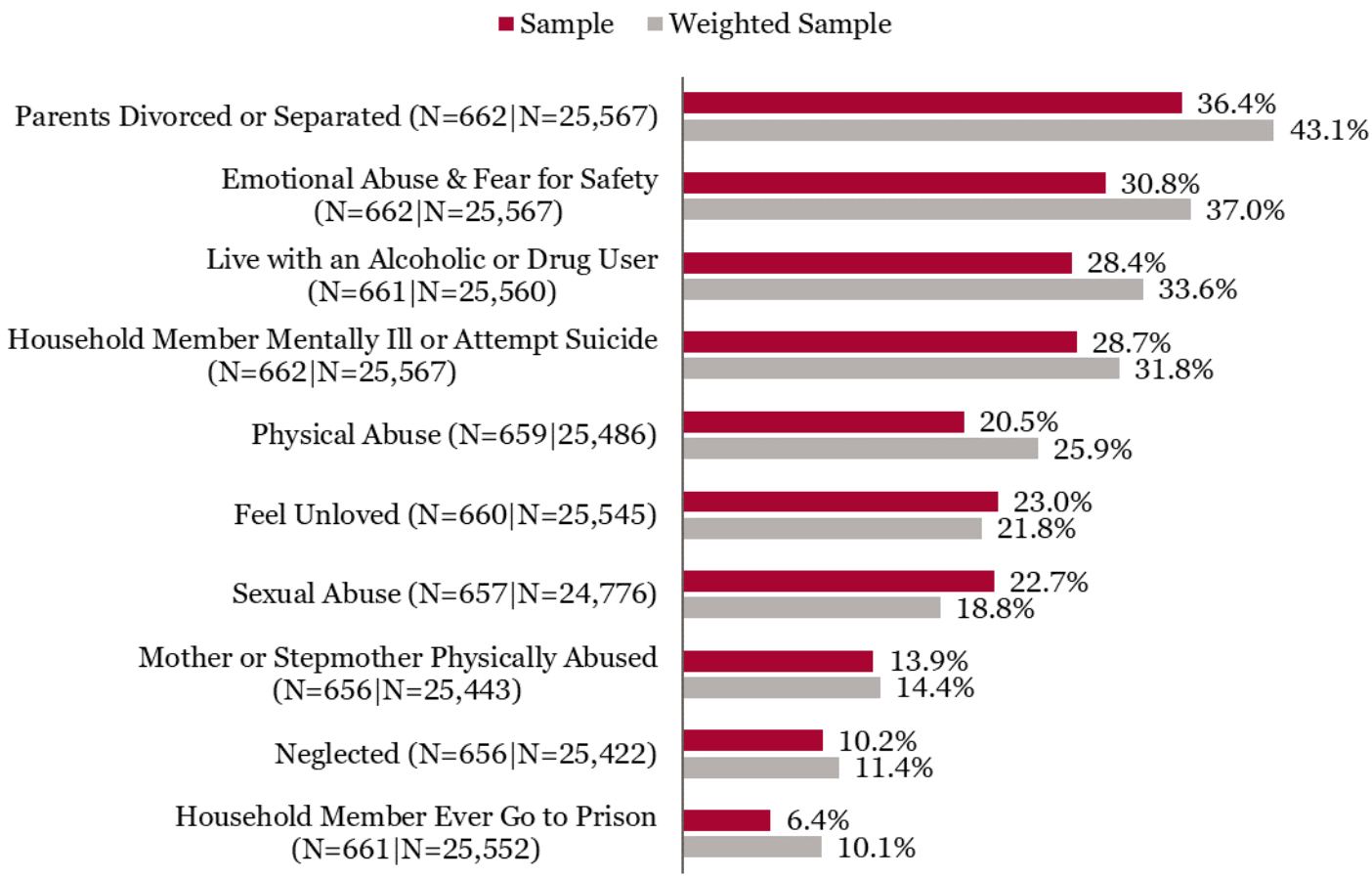


Figure 9: Educational Attainment for those with Zero ACEs and those with 4 or More ACEs, weighted sample (p< .001)

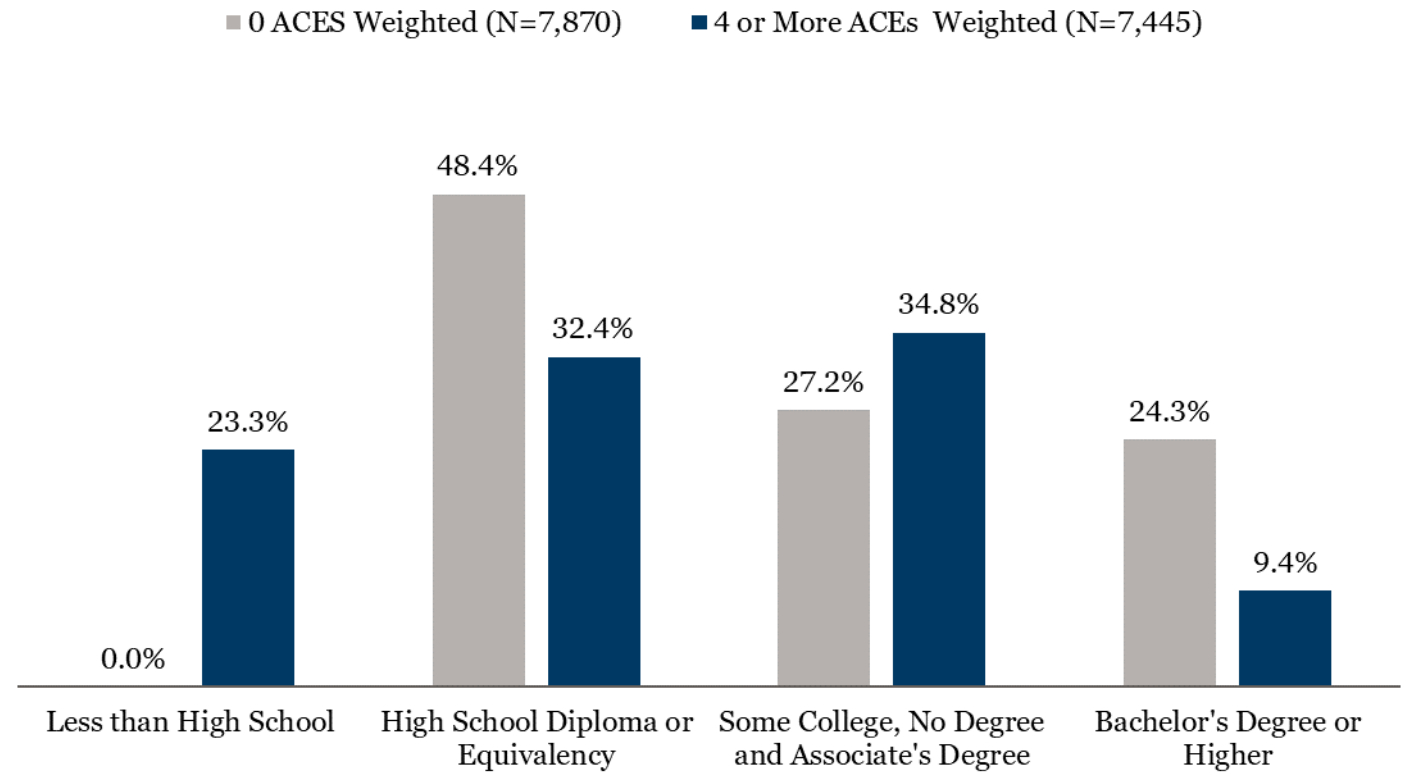
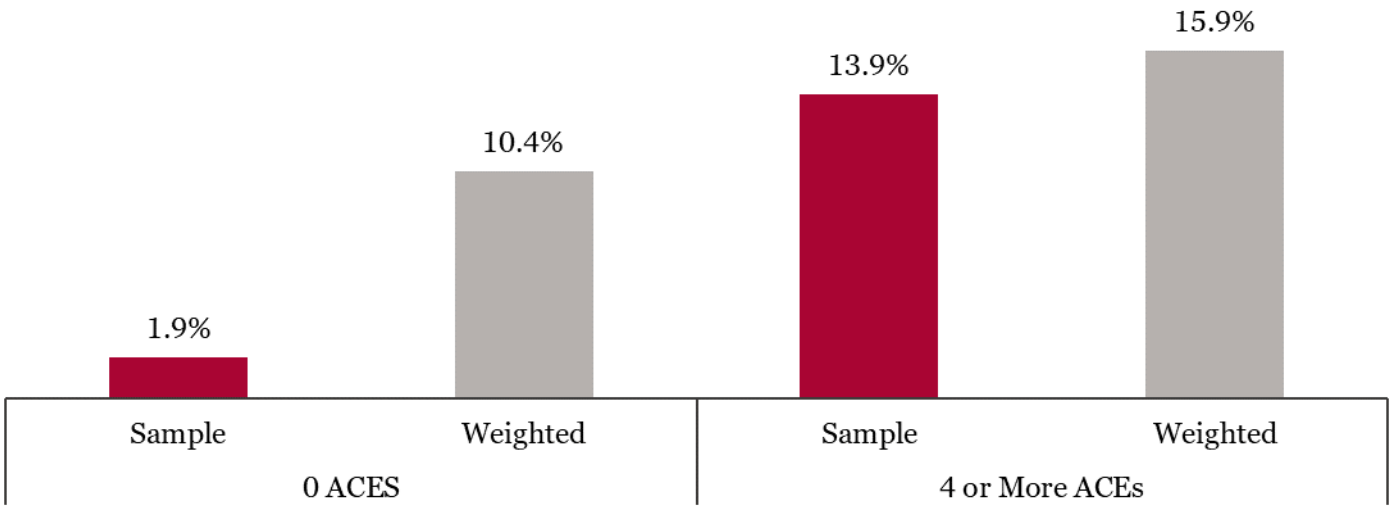


Figure 10: Percent with Zero ACEs and Four or More ACEs that Report Having Struggled with Employment Stability (Sample N=637|Weighted N=24,391, p<.001)



The survey asked respondents to report on a selection of health behaviors, physical and mental health outcomes to explore their association with ACEs among Jefferson County residents. Those with four or more ACEs are significantly more likely than those with zero ACEs to smoke or to have smoked regularly at some point in their life (Figure 12). In Jefferson County, a higher ACE score is significantly associated with higher rates of sexually transmitted infections, heart disease, chronic lung

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Figure 11: Income Distribution for those with Zero ACEs and those With 4 or More ACEs, weighted sample (N=24,476, p<001)

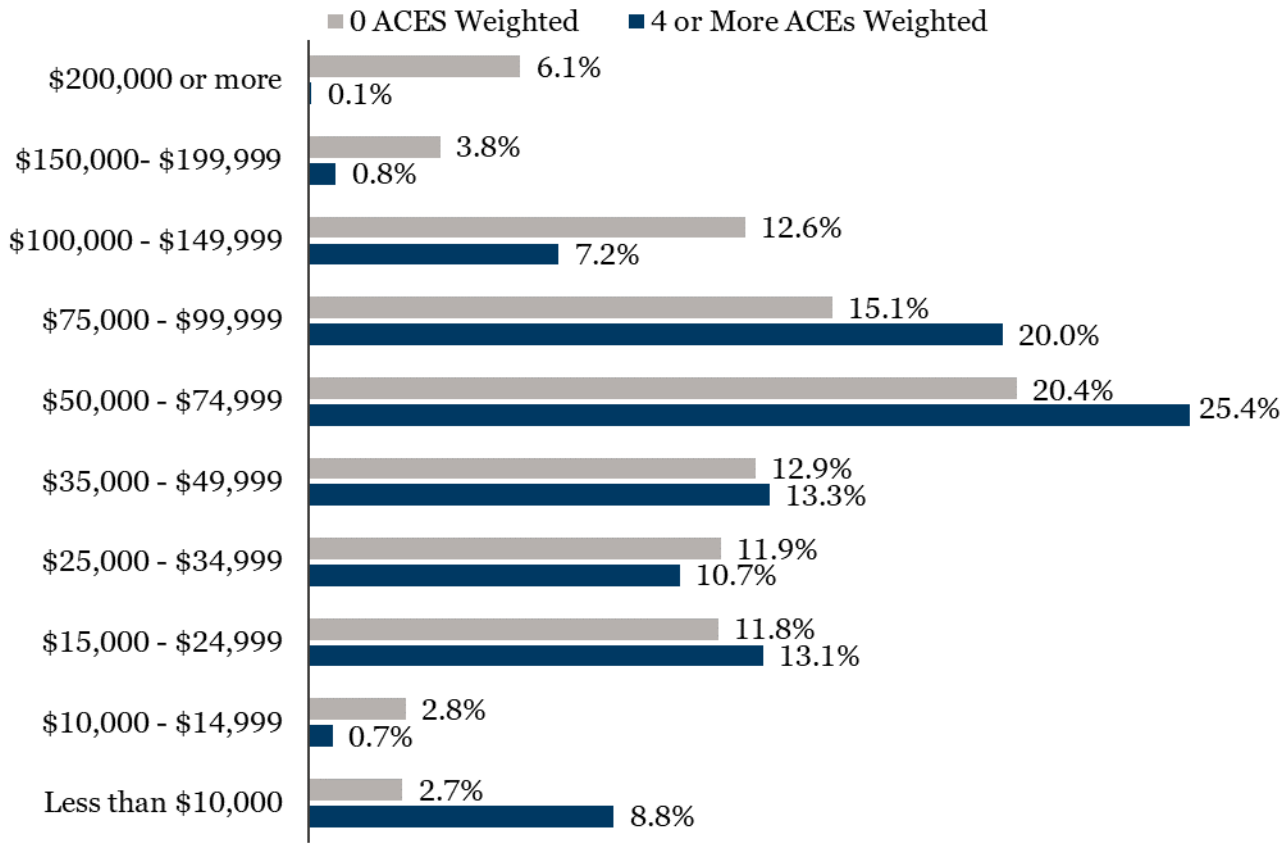


Figure 12: Percent Indicating they Smoke or Have Ever Regularly Smoked Cigarettes by ACE score category (Sample N=642 | Weighted N=24,474, p<.001)

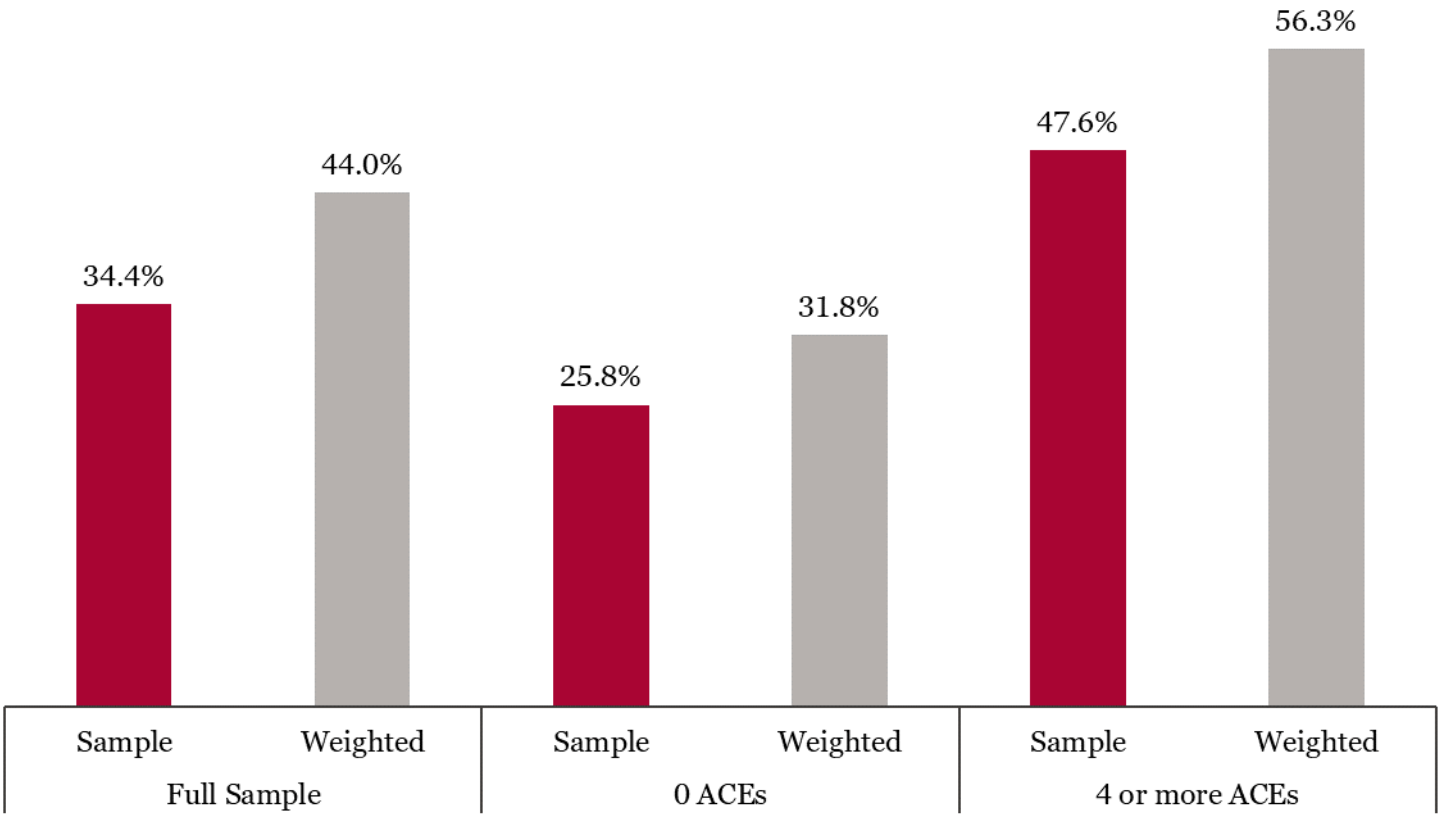
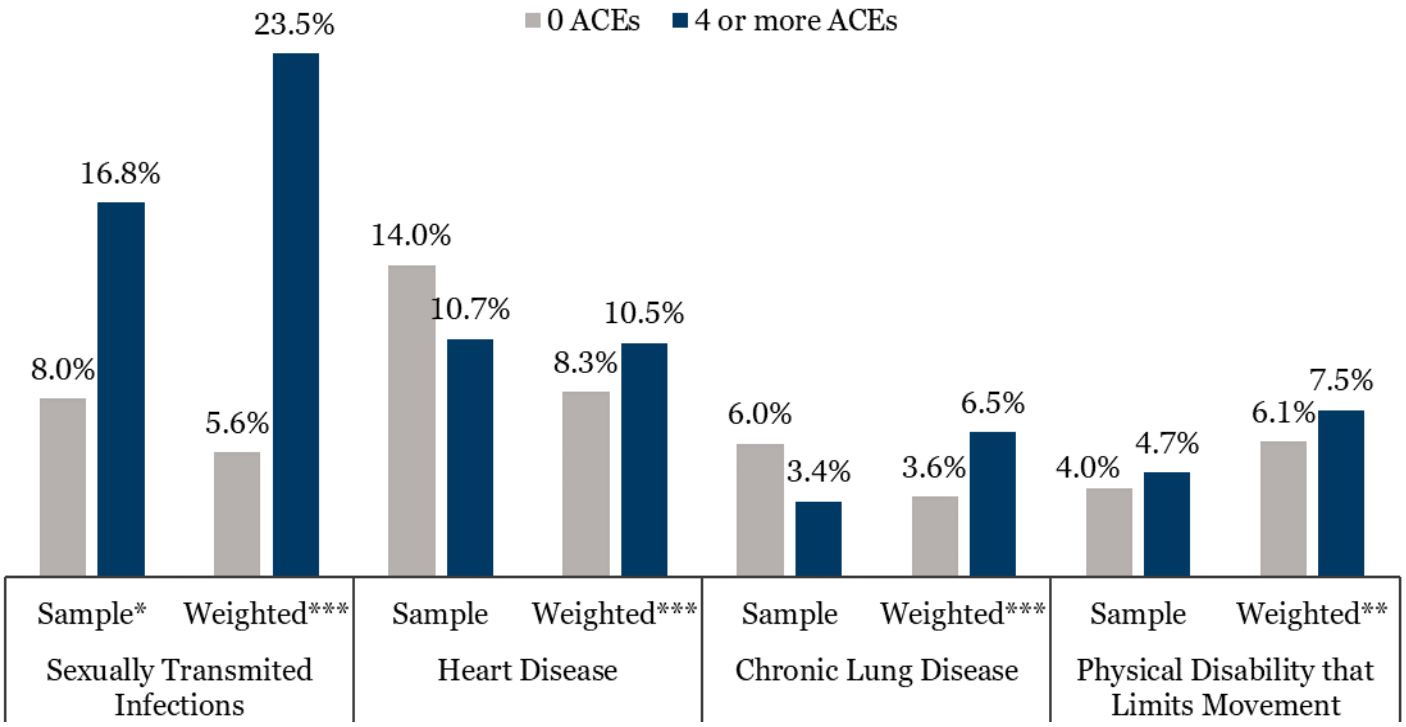
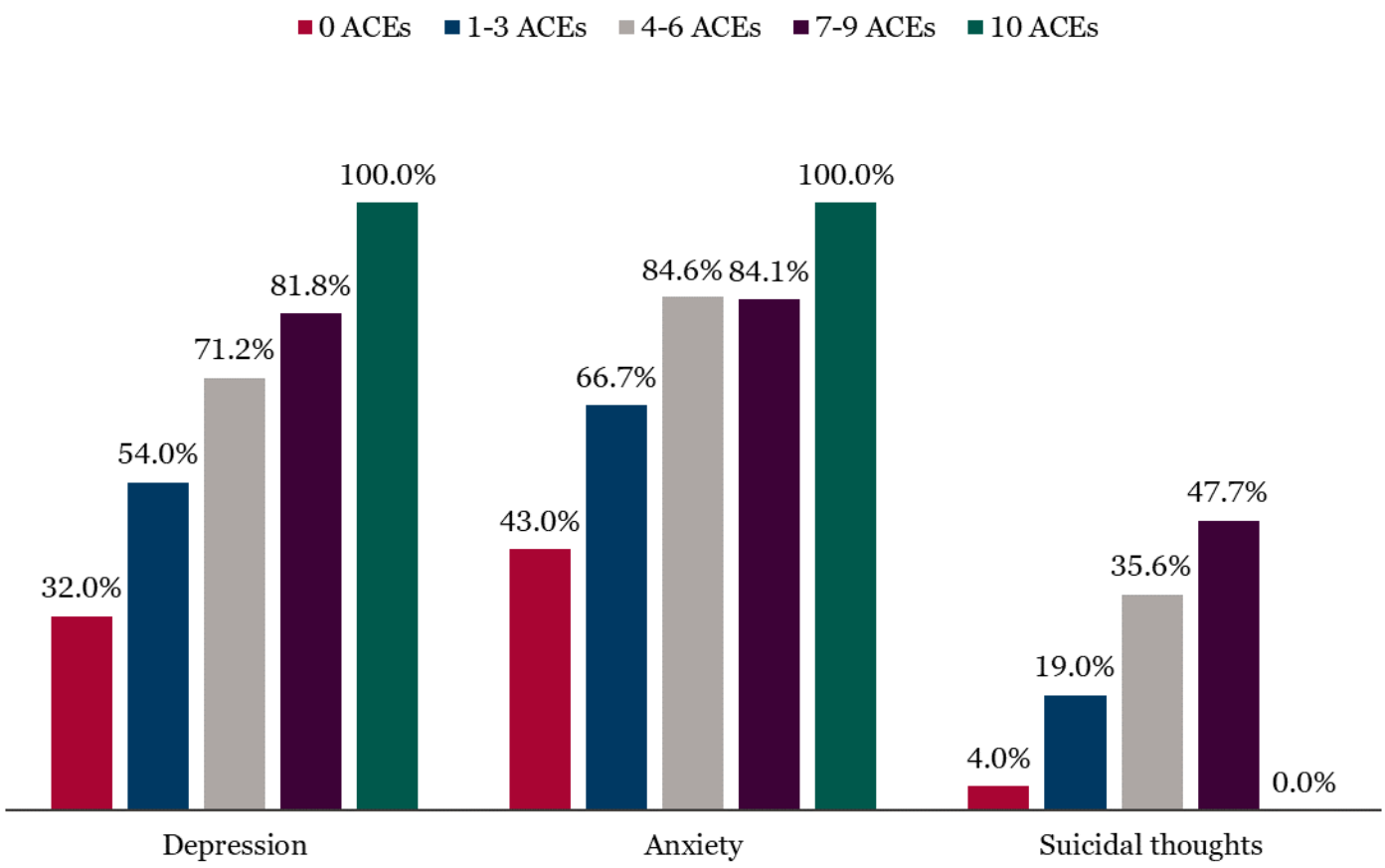


Figure 13: Prevalence of Health Issues for those with Zero ACEs and those with Four or More ACEs (Sample N=438 | Weighted N=25,567)



Statistically significant differences in prevalence between those with zero ACE and those with four or more ACE are indicated with asterisks. *p<.05, **p<.01, ***p<.001. Contrary to findings in the literature, associations with liver disease and obesity were not found to be statistically significant in the Jefferson County sample, with or without weighting.

Figure 14: Prevalence of Reported Mental Health Concerns by ACE Score, Sample (N=448)



disease, and physical disability that limits movement (Figure 13); all confirming findings in the literature on ACEs and adult health outcomes. Interestingly, the original ACEs research focused on obesity. In Jefferson County, however, obesity rates were not significantly different between those with zero and those with four or more ACEs.

The weighted sample indicates positive associations between higher ACE scores and mental health issues among Jefferson County adults as well. Figure 14 illustrates that as one moves up in ACE score category, so too does the likelihood of depression, anxiety, and suicidal thoughts. When those with four or more ACEs are compared to those with zero ACEs (Figure 15), prevalence of each mental health issue is significantly higher among those with 4 or more ACEs ($p<.001$).

Finally, in a state and region beset with some of the worst of the opioid epidemic, those with four or more ACEs are 10 times more likely than those with zero ACEs both to report a diagnosis or self-assessment of substance use disorder and to have ever misused prescription pain killers or to have used street opioids such as heroin (Figure 16).

Findings from Jefferson County confirm the existing research on the association between ACEs and adult health, mental health, and substance abuse outcomes. With a higher average ACE score than the nation, it is not surprising that Jefferson County also sees higher rates of chronic disease, mental health challenges, and substance use disorder.

Discussion

Childhood trauma disrupts neurodevelopment, causing social, emotional, and cognitive impairments that affect behaviors, including health behaviors.[33] These impacts lead to negative outcomes in health, mental health, education, income, and social success and well being, ultimately resulting in early death.

Aggregated across a county, a higher than

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Figure 15: Prevalence of Reported Mental Health Issues for those with Zero ACEs Compared to those with 4 or More ACEs

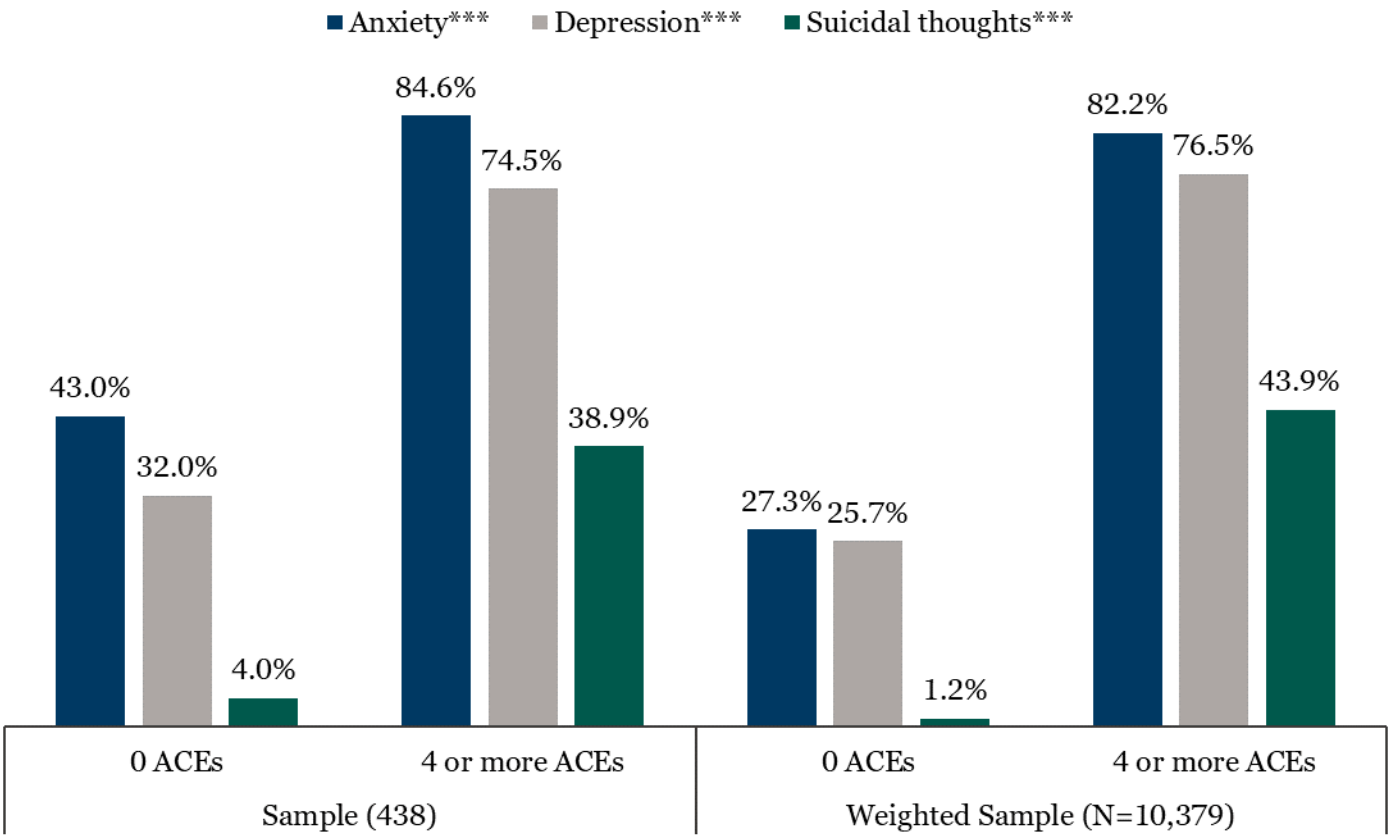
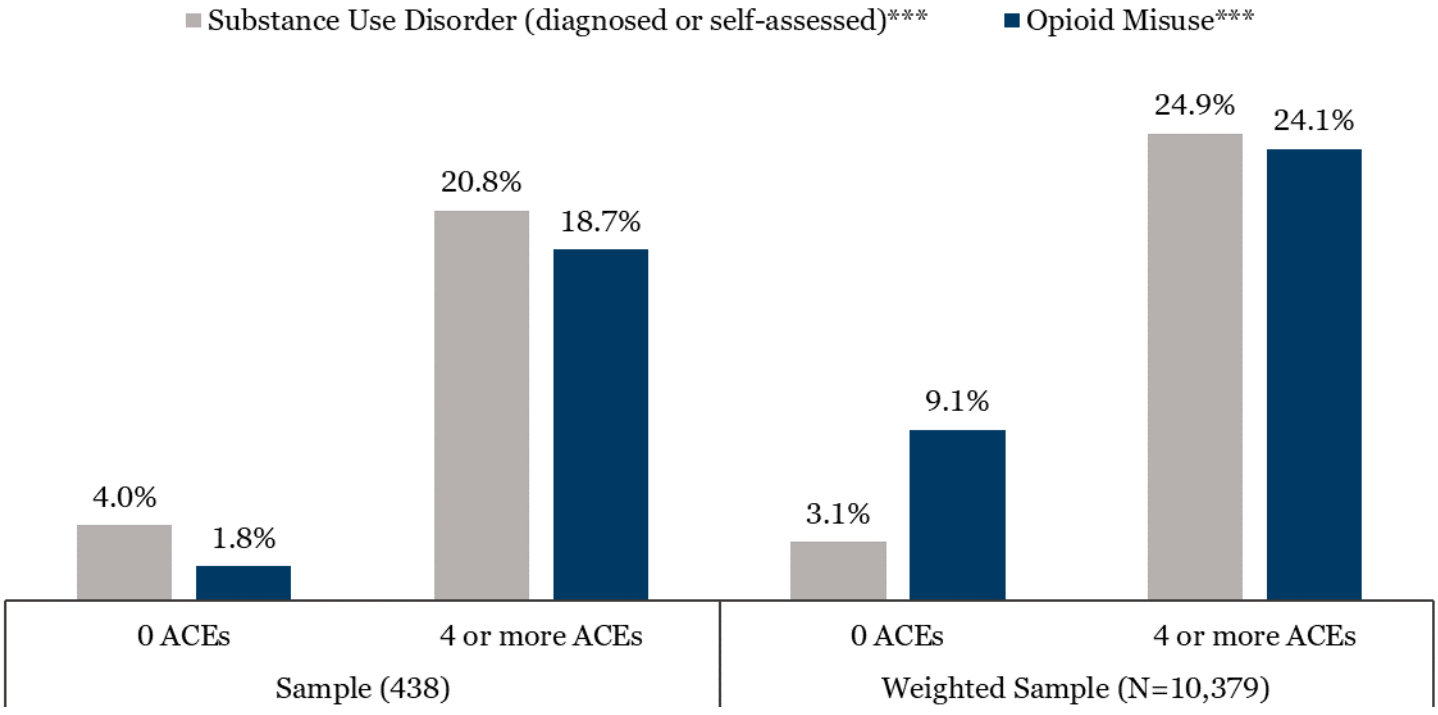


Figure 16: Percent Indicating any Substance Use Disorder and Misuse of Prescription Painkillers or Use of Street Opioids Such as Heroin among those with Zero ACEs and those with Four or More ACEs



average prevalence of such experiences results in myriad challenges from low educational attainment and employment instability to high rates of chronic disease, substance use disorder, mental health concerns and suicide.

While childhood trauma is not the only factor that shapes quality of life outcomes, it is one that we understand, is well-documented, and can be prevented and mitigated through building individual and community resilience. A strong focus on building healthy childhoods, social connections, and effective parenting skills can lay the foundation for improving outcomes. Communities need to engage business, government, and the nonprofit sector to align resources and influence to build support for access to mental health care, quality care and education for children birth to 18, and community building activities that reduce isolation, build social ties, and improve resilience.

Effective and sustainable community and economic development efforts can reduce household financial stressors that contribute to the prevalence of ACEs. Prevention and mitigation priorities may include the following[34]:

- Create and redesign policies and jobs that support workers with living wages.
- Build early care, school, and extracurricular youth programs that support families (birth to 18).
- Teach social-emotional skills with attention to safe and healthy relationships and healthy parenting and family dynamics.
- Connect youth to caring adults.
- Provide widespread access to physical and mental health care and family-centered treatment for substance use disorders.

The data from Jefferson County suggest significant opportunities to improve quality of life and community well-being through preventing and mitigating the impacts of childhood trauma. A focus on resilience and social support for healthy individuals and families can provide leverage for stronger and more sustainable community and economic development.

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(Full citations available at www.resilientjeffersoncounty.org)

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