



Breaking the Cycle: How Tennessee's Health Crises Relate to Adverse Childhood Experiences

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November 6, 2020

Executive Summary

Tennessee has appeared in many health-related headlines, leading the country in opioid misuse and deaths, excess chronic disease burden, and loss of health coverage and access. In recent years, Tennessee's poor health status has cost the state billions of dollars due to lost productivity and direct medical expenses. At the same time, adverse childhood experiences (ACEs) have been recognized as an alarming public health crisis, with the incidence of childhood trauma in Tennessee outpacing the rest of the country. While examining whether there are connections between the state's healthcare issues and the prevalence of ACEs in Tennessee, the following observations emerged:

- The increased burden of substance use disorders in Tennessee likely contributes to the rise in the number of ACEs individuals face in the state. Specifically, parental or personal opioid use counts as an ACE itself, and this has the potential to lead to further abuse, neglect, or household dysfunction.
- As the number of ACEs individuals face increases, the risk for chronic illness multiplies. With Tennessee's excess load of chronic diseases and ACEs, the toxic stress that results from childhood trauma appears to be a possible explanation of the state's poor workforce health.
- ACEs are cyclic and multigenerational issues that cannot be combated without adults and children having access to affordable preventive care and treatment. Tennessee has yet to expand Medicaid and has seen a large disenrollment of children from TennCare and CoverKids, making it difficult to address and mitigate ACEs.
- The COVID-19 pandemic has exacerbated the occurrence of ACEs due to increased stress and instability, while limiting access to resources that families need to prevent and overcome trauma.

To address these serious issues, there should be more comprehensive screening for ACEs during primary care visits to halt generational transmission. Tennessee should also expand Medicaid to ensure low-income individuals at greater risk for these health crises have received proper care and screening. Lastly, ACEs education should be incorporated into grade school curriculum, so children are able to advocate for themselves if all other methods of detection and care fail. These efforts would help create a healthy future for all Tennesseans.

The Main Health Crises in Tennessee

Of the major obstacles that Tennesseans face, health-related issues are among the most devastating. For nearly three decades, Tennessee has consistently placed in the bottom 20th percentile for public health, most recently ranking 44th out of the 50 states in 2019¹. After thorough analysis, the Sycamore Institute, a nonpartisan research center in Tennessee, concluded that Tennesseans must actively combat the following crises to promote positive growth: the opioid epidemic, poor workforce health, and the general lack of access to health care².

As the opioid epidemic has intensified over the past seven years, Tennessee has seen unparalleled growth in the rate of opioid-related deaths. Between 2016 and 2017, Tennessee's rate jumped from 18.1 deaths per 100,000 people to 26.4 deaths per 100,000 people, both values significantly higher than the national rate in 2016 and 2017 respectively^{3,4}. This increase is not limited to prescription opioids, but rather encompasses synthetic opioids like fentanyl, and heroin, both drugs posing as large challenges to overcome due to ease of access⁵.

Additionally, the increased prevalence of chronic conditions such as diabetes, cardiovascular disease, and hypertension in the average laborer in Tennessee has a huge economic impact. Ranking 45th, 45th, and 44th nationally in 2019 for the three diseases respectively, Tennessee bears increased medical costs and decreased productivity as a result of poor health^{6,7}. Compounded with the increase in people affected by substance use disorders, Tennessee's workforce quality and size are threatened, ultimately hindering the state's economic potential⁸.

Most notably, as Tennesseans have faced a greater need for healthcare, citizens have found it more difficult to access available resources⁹. For instance, in 2018, at least 88,305 children lost coverage through Medicaid and CHIP, Tennessee's publicly subsidized health insurance for qualified low-income individuals and children, due to administrative and bureaucratic issues¹⁰. This coverage loss is in addition to the many low-income adults who are in the coverage gap because of Tennessee's decision not to expand Medicaid¹¹. This coverage gap refers to the 300,000+ individuals who do not qualify for Medicaid, no matter how little they earn, because they do not fit within a traditional eligibility category. These adults also earn too little to qualify for premium subsidies in the state-based marketplaces¹².

Moreover, at least thirteen hospitals have closed their doors in Tennessee, which is more per capita than any other state in the nation^{13,14}. Many more hospitals have reduced services due to financial instability. Coupled with existing healthcare facilities exceeding their capacity due to the COVID-19 pandemic, many of Tennessee's adults and children have a difficult time accessing health care¹⁵.

Adverse childhood experiences have been recognized as an alarming public health issue that elevates the risk of many chronic diseases and unhealthy behaviors. With Tennessee facing these health crises, it is important to assess and address how experiences of abuse, neglect, and household dysfunction in childhood may be exacerbating Tennessee's poor physical and economic health.

Adverse Childhood Experiences

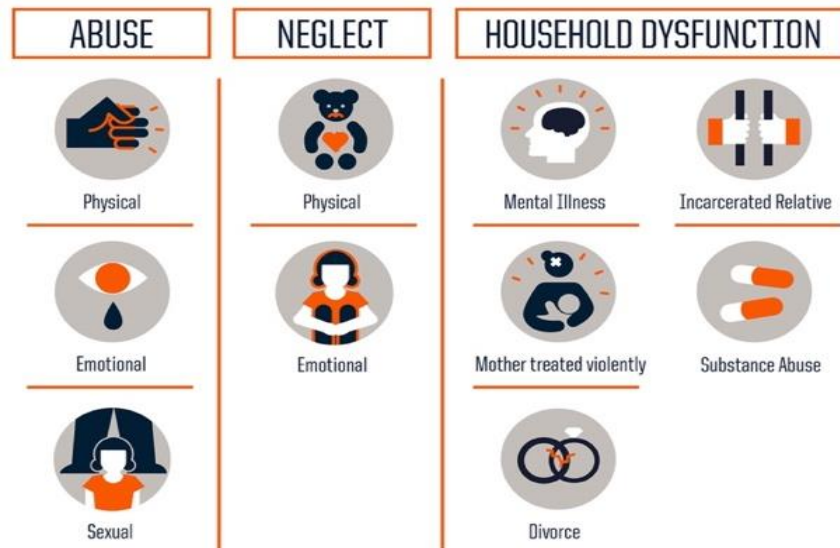


Figure 1. The most common types of childhood adversity
Source: Robert Wood Johnson Foundation

Adverse Childhood Experiences, better known as ACEs, refer to all forms of abuse, neglect, and household challenges that occur to children under eighteen years¹⁶. The image above depicts the original ten types of ACEs: physical, emotional, and sexual abuse; physical and emotional neglect; mental illness, incarcerated relative, violence against mother, substance abuse, and divorce. The definition has evolved to include experiences in the community like poverty, racism, and bullying¹⁷.

While experiencing any of these events is traumatic enough, affected children may suffer from life-long consequences. The stress that arises from “strong, frequent, and prolonged” abuse, neglect, or household dysfunction is considered toxic and can overcome the growth of cognitive skills needed for resiliency¹⁸. Specifically, because brain development is extremely active during childhood, neuronal wiring and synaptic pathways are subject to alteration¹⁹, modifying how children react and cope with everyday stressors. Secondly, the accumulation of toxic stress increases inflammation, paving a pathway for acquiring life-threatening diseases such as obesity and alcoholism²⁰.

As the number of ACEs children encounter increases, the likelihood of facing these negative health and life outcomes increases during adulthood²¹. But these side effects alone cannot communicate the gravity of the public health issue. In the original ACEs study conducted by the Center for Disease Control and Prevention and the Kaiser Family Foundation in 1998, around two-thirds of the 17,337 adults surveyed in California experienced one or more ACEs²². More recent studies using the 2016 National Survey of Children’s Health found that forty-five percent of children in the United States had experienced at least one ACE, with one in ten children experiencing three or more ACEs²³. A 2016 study discovered more than one in four Tennesseans had suffered from three or more ACEs, a significant deviation from the national rate²⁴. Why is there an increased prevalence of ACEs in Tennessee?

The Connection Between TN's Opioid Crisis and ACEs

As exemplified through the staggering increase in opioid-related deaths, substance use is a grave issue in Tennessee. After Governor Haslam implemented his *TN Together* initiative, which placed restrictions on the supply of opioid prescriptions, the demand for more potent and dangerous alternatives (such as fentanyl and heroin) increased, making substance use an ongoing problem²⁵.

Substance use also happens to be one of the largest contributors to ACEs, with one in five children living in homes in which family members are actively involved in the consumption or the distribution of drugs and alcohol²⁶. While substance use qualifies as an ACE, it has the potential to lead to further maltreatment²⁷. Specifically, family members using drugs are at risk for mental and physical illness, unemployment, and using limited resources to fuel their disease, all which may cause additional ACEs²⁸. Noting that disasters tend to correlate to increased substance use due to increased stress and instability, it is presumable that the COVID-19 pandemic has exacerbated these effects²⁹.

In fact, data indicate there is increased neglect and abuse in children due to substance use disorders. Between 2012 and 2017, when the opioid epidemic was at its peak, Tennessee's Department of Children's Services (DCS), the state's child welfare organization, saw a ten percent increase in the number of cases and allegations related to substance use³⁰. While children entering state custody does not necessarily imply that they experience an ACE, it is strongly correlated to some sort of abuse, neglect, or household dysfunction that arose due to the substance use at home³¹. With the COVID-19 pandemic, reports of child maltreatment should be increasing; however, rates of child abuse and neglect have declined due to necessary social distancing by limiting contact with mandatory reporting professionals³². With children potentially being stuck at home with their abusers, the children could face more serious and lasting health and behavioral outcomes in the future³³.

It is also important to note that Tennessee's rate of neonatal abstinence syndrome (NAS), in which infants experience withdrawal-like symptoms shortly after birth, is almost nine times higher than the national average of 6.0 infants with NAS per 1000 births in certain regions of the state.³⁴ Since many of these mothers are lacking access to the proper treatment and support to overcome their disorders, substance use has the potential to lead to further abuse and neglect in affected children.

The Relationship Between ACEs and Poor Workforce Health

The declining health of Tennessee's adults in the workforce could be the outcome of a myriad of factors including food insecurity, ease of access to less nutritious meal options, and job stress. While there is no denying the multiple upstream and downstream elements that may be causing poor health habits and issues, the effect that ACEs have on the risk of developing chronic diseases is compelling.

ACEs can have lasting effects on behavior & health

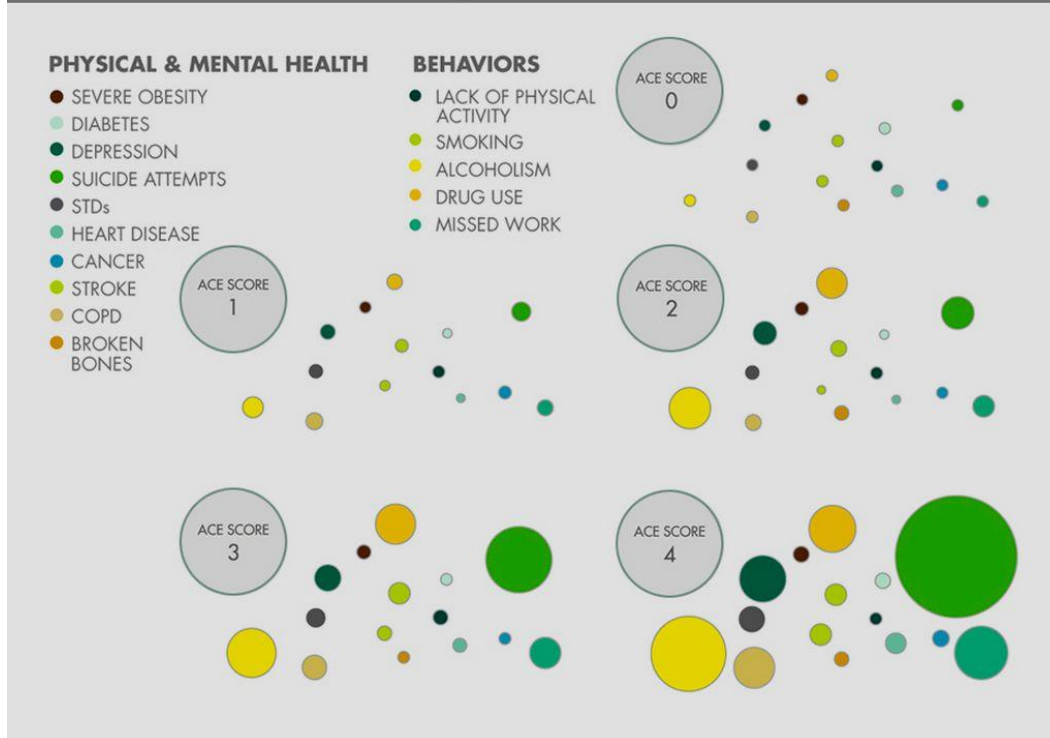


Figure 2. The risk of certain chronic illnesses and unhealthy behaviors increases with more ACEs.
Source: Michigan Department of Health & Human Services

In a recent study analyzing the 2011-2012 Behavioral Risk Factor Surveillance System (BRFSS) that consisted of almost ninety thousand responses from adults across nine states including Tennessee, there was a positive correlation between the number of ACEs an adult experienced and their likelihood of acquiring early-onset chronic disease³⁵. As the number of ACEs increased, respondents were two to four times more likely to have a chronic condition or poor health behaviors³⁶. Therefore, it is not startling that an increase in ACEs is also linked to an elevated risk of premature death³⁷. Both would be considered harmful to Tennessee's workforce since poor health reduces productivity and premature death decreases the number of individuals in the workforce.

Some expanded definitions of ACEs include poverty, which further contributes to poor workforce health. Tennessee was ranked 42nd for the percentage of children living in households with incomes below the poverty line in 2018³⁸. The Supplemental Nutrition Assistance Program (SNAP), formerly known as Food Stamps, and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), the federal nutrition assistance program for women with children, provide benefits for families in need; however, the average SNAP benefit in Tennessee is \$125.18, which is insufficient for proper nutrition³⁹. Resultingly, low-income working adults can still face competing financial priorities and stress leading to household dysfunction, income-related health disparities and other poverty-related issues⁴⁰.

The Cyclic and Multigenerational Nature of ACEs

When discussing the impact that different individuals can have on a child's future resilience and health, it is important to assess what factors may exacerbate the circumstances that lead to ACEs. Interestingly, yet unsurprisingly, caretakers and role models with a high number of ACEs tend to encounter poor outcomes and engage in poor behaviors, perpetrating toxic stress on the children with whom they interact⁴¹. Increased toxic stress experienced by mothers during pregnancy can negatively impact the activation and deactivation of genes critical for fetal development, affecting the child's future⁴². The COVID-19 pandemic only adds to this toxic stress due to latent consequences of quarantine and social distance, with these necessary preventive measures limiting support during pregnancy⁴³. Furthermore, while the full extent is unknown, the pandemic likely increases the risk of mental health illness among expectant mothers, negatively affecting both the mother and child's physiological and psychological health⁴⁴.

As a result, many of the adults who contribute to ACEs for the next generation should not be criminalized, as they may have had unfavorable experiences during childhood that have not been recognized or addressed. In fact, studies have shown how punitive measures for substance use during pregnancy are associated with higher rates of NAS, the criminalization instead endangering the health of both mother and child^{45 46}. Rather, efforts to support parental education have been shown to curtail child abuse and neglect, thus reducing the incidence of ACEs⁴⁷. Specifically, interventions such as Health Resources and Services Administration's (HRSA) Maternal, Infant, and Early Childhood Home Visiting Program (MIECHV) target families in vulnerable communities to help prevent child maltreatment, mitigate domestic violence, and improve financial stability⁴⁸. Many forms of evaluation have showcased the short-term and long-term success of home visitation, such as statistically significant reductions in child abuse and substance use by the child during adolescence⁴⁹.

Referring to the previous discussion on the relationship between increased number of ACEs and poor health and life outcomes, it stands to reason that efforts to reduce the number of ACEs experienced during childhood, such as home visitation, will likely mitigate the incidence of negative outcomes. While home visitations are currently complicated by the pandemic, a holistic approach in which an individual's trauma is identified and treated in a supportive manner is critical for breaking the cycle that ACEs provoke.

The Role of Healthcare in Reducing ACEs

Access to healthcare is considered one of the most important protective measures to reduce the frequency and extent of child abuse and neglect^{50 51}. This is because healthcare providers can recognize and start providing treatment and resources for intervention⁵². If providers notice familial substance use, they can guide the family member towards rehabilitation programs. If staff notice a history of chronic disease, they can inform families about good health practices and methods to combat toxic stress⁵³. While it would be up to the family to seek help, the providers can recognize and advocate for their patients to stop the ACEs cycle from progressing. Unfortunately, Tennessee has a large population of uninsured individuals, ranking 38th in the nation for this issue in 2019.

The number of children enrolled in Medicaid declined by over fifty-six thousand individuals between January 2017 to December 2019⁵⁴. While disenrollment alone does not indicate loss of coverage, there was a 38% increase in the child uninsured rate in Tennessee during the same time period, sabotaging the progress that had previously been made to insure all children in the state⁵⁵. Therefore, efforts like the [Insure Our Kids](#) campaign are important to reach uninsured children and connect them to enrollment assistance.

With the understanding that ACEs are cyclic and multigenerational issues, it is equally as important to actively address the needs of adults who have faced ACEs. Adults should also have access to healthcare, so they can have the treatment and support necessary to escape the cycle of ACEs. As previously noted, despite Tennessee's high ACE incidence, the state government has decided not to expand Medicaid, leaving over 300,000 people without affordable access to health insurance⁵⁶. Coupled with significant hospital closures, reducing access for uninsured individuals to seek care in hospital emergency departments, many Tennesseans truly find themselves stranded without access to health care⁵⁷. If these individuals did not already face ACEs, the strain that inadequate healthcare access puts on a family can by itself lead to abuse, neglect, or household dysfunction. This strain is further amplified due to increased burden on healthcare facilities and families during the COVID-19 pandemic.

Policy Recommendations

- **There should be more comprehensive screening for ACEs during all primary care visits.**

While well-child and home visits are down due to the pandemic, the American Academy of Pediatrics encourages parents to continue taking their children to the pediatrician for in-person visits to get vaccinations and physical exams, offering an opportunity to continue assessing for ACEs⁵⁸. Since many children are not coming into contact with other mandatory reporters of abuse without these in-person doctor visits, it is important that health care access is not a barrier for detecting ACEs. Many pediatricians now ask about ACEs; however, since studies on the risks associated with ACEs are from the past two decades, it is possible that many current caretakers and other adults have not been screened for ACEs. While it is difficult to ask about private and personal experiences, providers for all ages should be trauma-informed, and trained to screen and support individuals who have encountered ACEs. Being trauma-informed consists of recognizing the prevalence of trauma, understanding its impact on individuals, and seeking practices that are cognizant and sensitive to trauma⁵⁹. This is important for three main reasons: 1) to halt individuals from passing down ACEs to their children, 2) to reduce the burden of chronic diseases and poor health behaviors that may arise due to ACEs, and 3) to improve the quality and quantity of Tennessee's workforce.

- **The expansion of Medicaid is critical for widely addressing ACEs.**

Even with the implementation of more comprehensive screening, many individuals do not have the means or opportunity to seek support due to Tennessee's coverage gap and children disenrollment issue. For ACEs screening and care to be effective, all individuals should have access to healthcare which is partly achieved by expanding Medicaid. The expansion of Medicaid would allow the individuals who lie between 100% and 138% of the federal

poverty level (\$12,760 to \$17,609 annually for an individual) to have coverage that does not break the bank⁶⁰. The expansion itself can also decrease the strain that lack of health coverage can cause, eventually reducing ACEs like household dysfunction and poverty. Furthermore, effective programs such as MIECHV are often limited to families receiving Medicaid, so the expansion of Medicaid can also help more families receive a cost-effective intervention to reduce ACEs.

- **ACEs education should be incorporated into grade school curriculum.**

While we train educators and caretakers about ACEs, affected children may find themselves being bullied by their peers due to a general lack of understanding of ACEs among the younger demographic. With nuanced definitions of ACEs including bullying, it is important to educate students about these experiences and how to be trauma-informed. This sort of education could be combined with the mental health seminars many high schools provide. It can also serve as a safeguard since students can advocate for each other rather than waiting for an adult to notice signs of potential ACEs. Furthermore, during times of social isolation as exemplified through the COVID-19 pandemic, young people will be educated and empowered to identify and report child abuse and neglect rather than deferring to other mandatory reporters.

Conclusion

Over the past few years, Tennessee has recognized the value in creating safe and nurturing environments for children to grow. Recently, Tennessee implemented *Building Strong Brains*, an initiative focused on funding professional development and educational programs tailored to increase awareness and to form a toolkit for addressing ACEs⁶¹. Secondly, some grade schools in Nashville have already transitioned to model trauma-informed practices⁶². While these initiatives are great steps forward in breaking the ACEs cycle, they should be done in conjunction with comprehensive screening, Medicaid expansion, and active education. By combating the prevalence of ACEs in the state, we can also reduce the annual \$5 billion-dollar bill that Tennessee faces from medical costs and lost productivity due to ACEs⁶³. While budgets are strained due to COVID-19, it is important to maintain and expand efforts to combat ACEs—these investments in social services will help Tennessee’s economy, health, and most importantly, people reap rewards in the future.

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