



Fostering Healthy Development in Tennessee

Understanding Positive and Adverse Childhood Experiences and the
Effect on Lifelong Health

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Presentation Overview

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Strong Foundations of Healthy Development

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ACEs and PCEs

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Positive Childhood Experiences in Tennessee

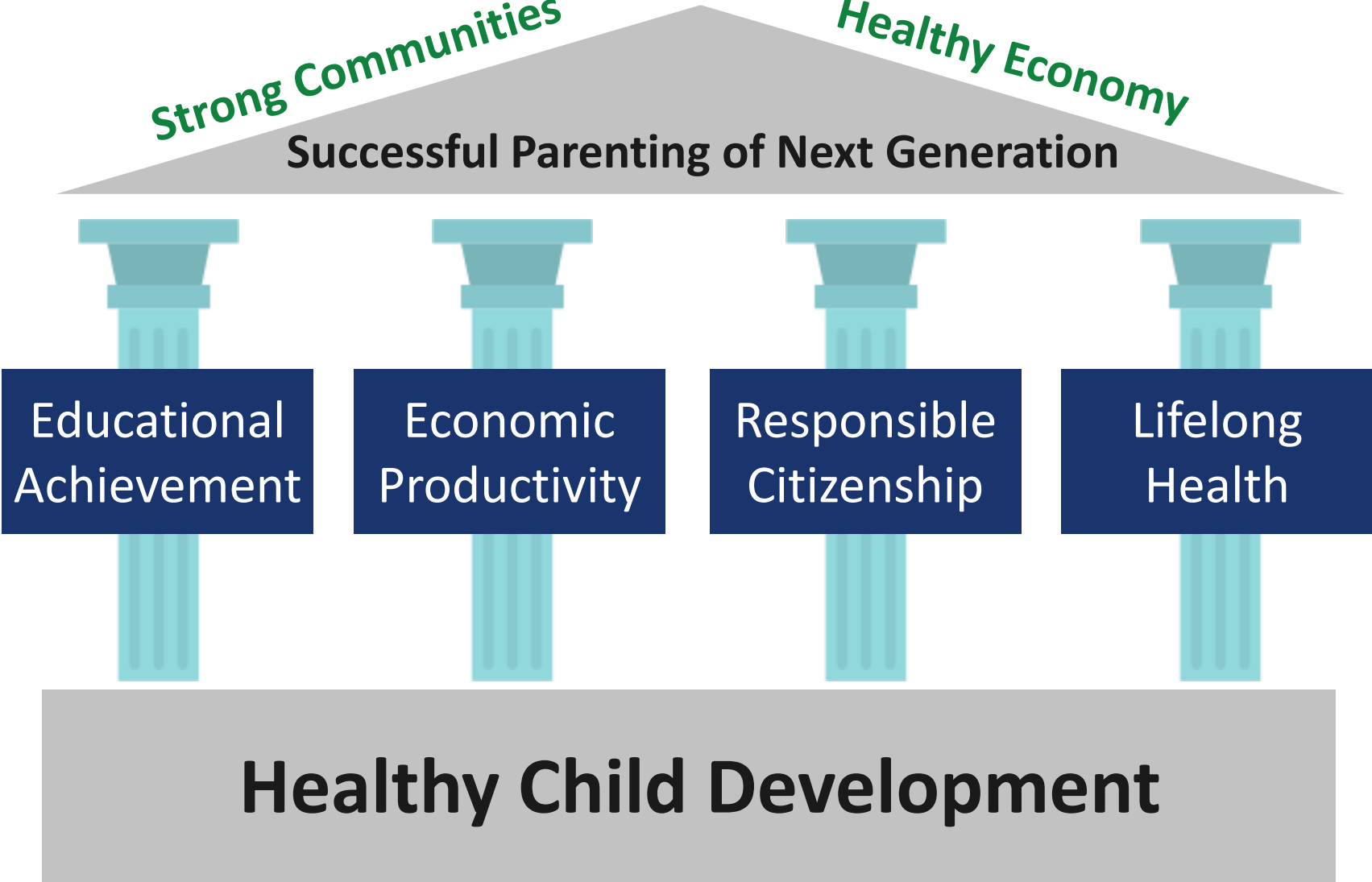
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Strategies for Action



**Strong Foundations of Healthy
Development**

Foundation of Community Health

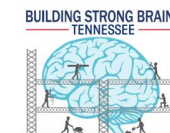


Four Core Concepts of Development of Development

- 1** ***Brain Architecture*** is established early in life and supports lifelong learning, behavior and health.
- 2** Stable, caring relationships and “***Serve and Return***” interactions shape brain architecture.
- 3** ***Toxic Stress*** in the early years of life can derail healthy development.
- 4** ***Resilience*** can be built through “Serve and Return” relationships, improving self-regulation skills and executive function. Though there are sensitive periods of brain development in early childhood and adolescence, resilience can be strengthened at any age.

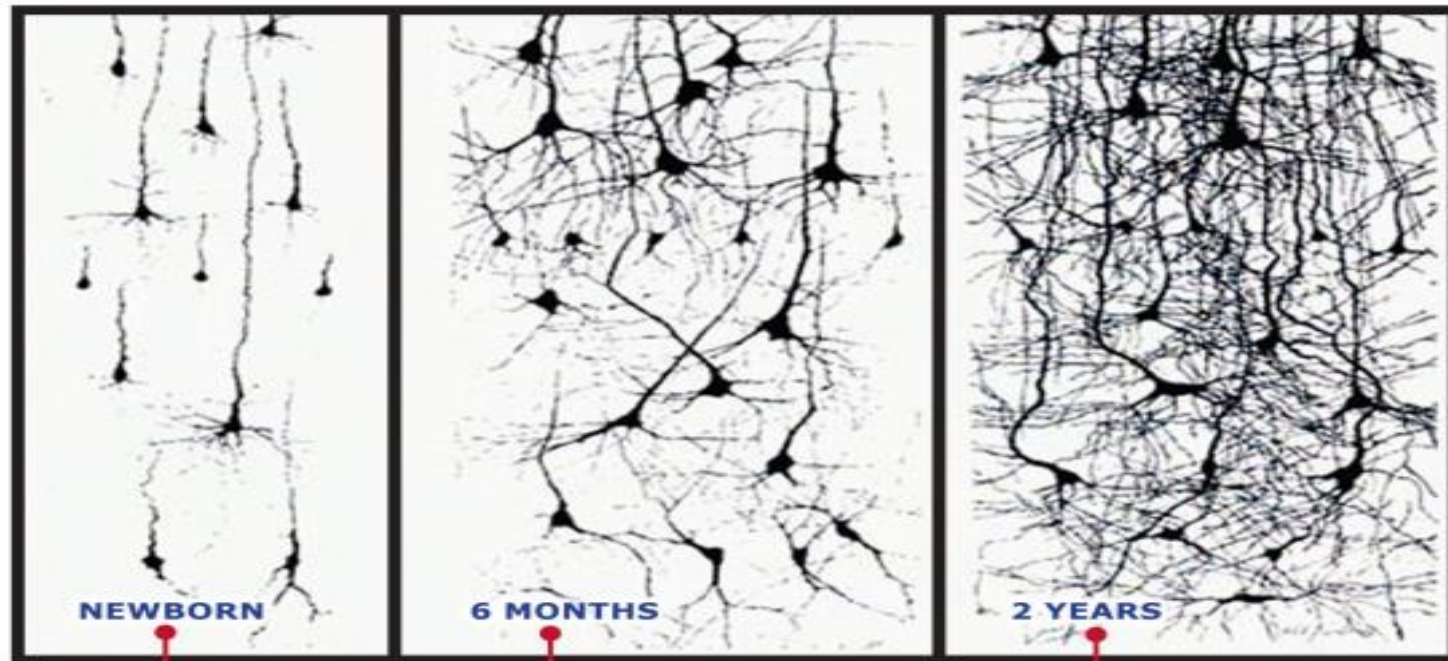


Brain Architecture



Over **ONE MILLION** New Neural Connections Per Second

+ 1,000,000 MORE THAN 1 MILLION NEW NEURAL CONNECTIONS PER SECOND

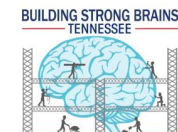


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The early years matter because, in the first few years of life, more than 1 million new neural connections are formed every second. Neural connections are formed through the interaction of genes and a baby's environment and experiences, especially "serve and return" interaction with adults, or what developmental researchers call contingent reciprocity. These are the connections that build brain architecture – the foundation upon which all later learning, behavior, and health depend.

Image source: Conel, J.L. The postnatal development of the human cerebral cortex. Cambridge, Mass: Harvard University Press, 1969.

Source: Center on the Developing Child at Harvard University, 2009



TN

Serve & Return Interactions Build Brains and Skills

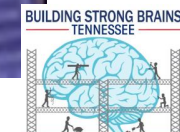


[This Photo](#) by Unknown Author is licensed under [CC BY-NC-ND](#)

Still Face Experiment



<https://www.youtube.com/watch?v=apzXGEbZht0>



Adolescent Brain Development: A Period of Vulnerabilities and Opportunities



The brain starts to undergo a **“remodeling”** project in adolescence, making it an opportune time to build resilience.

- **Air Traffic Control:** Before and during puberty, a second period of rapid neural growth occurs in the prefrontal cortex.
- **“Use it or lose it”:** The adolescent brain strengthens the neural connections that are used most often and prunes away those that aren’t used as frequently.
- **Integration:** The *corpus callosum*, which relays information between different parts of the brain, also undergoes waves of growth during adolescence, improving self-regulation.

Sources: Siegel, 2015; Spinks, n.d.



Toxic Stress Disrupts Brain Development



Three Types of Stress

Positive Stress



Short, stressful events like meeting new people or starting the first day of school are healthy for brain development. They prepare the brain and body for stressful situations later in life.

Tolerable Stress



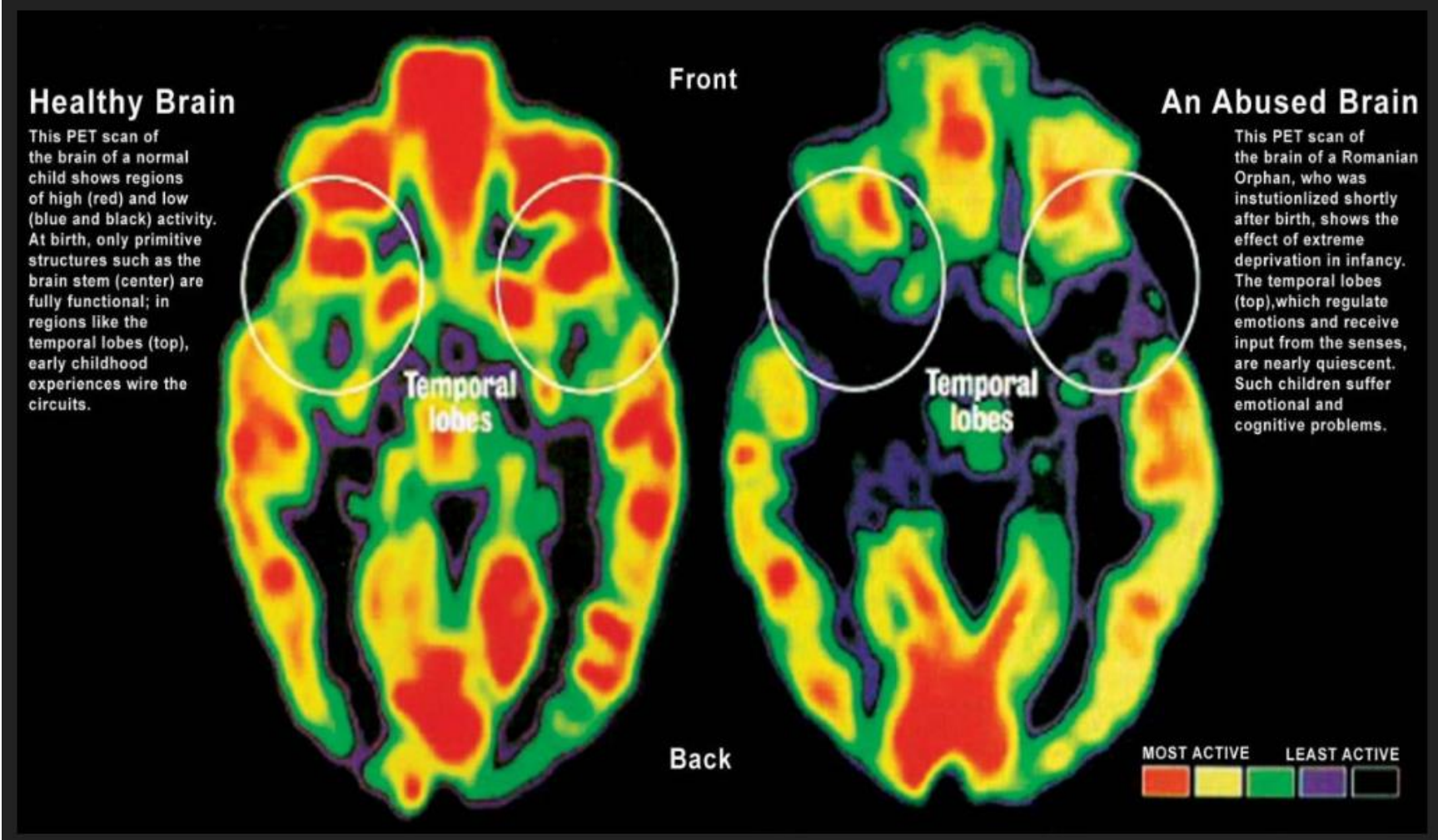
Tragic, unavoidable events like a natural disaster or losing a loved one aren't good for us. But if supportive caregivers are around to buffer the stress response, these events won't do lasting damage to the brain and body.

Toxic Stress

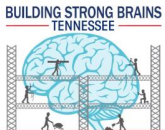


Ongoing, repeated exposure to abuse or neglect is bad for brain development. If no supportive adults are present to help buffer the stress response, stress hormones will damage developing structures in the child's brain. The result is an increased vulnerability to lifelong physical and mental health problems, including addiction.

Experience Alters Brain Development



Sources: Felitti, 2011; Nelson et al., 2007



“Air Traffic Control” System in the Brain



Improving Air Traffic Control Across the Lifespan

Focusing Attention

Problem Solving

Planning Ahead

Behavior Regulation

Controlling Impulses

Adjusting to New Circumstances



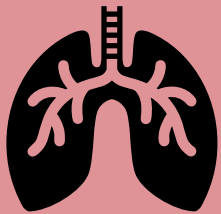
Executive Function and Self Regulation Skills can be built at any point across the lifespan.



ACEs and PCEs

Adverse Childhood Experiences

Adverse Childhood Experiences (ACEs) are potentially traumatic experiences during childhood (0-17 years) that can affect lifelong health. ACEs can impact physical, mental, emotional, and behavioral development.



PHYSICAL



MENTAL

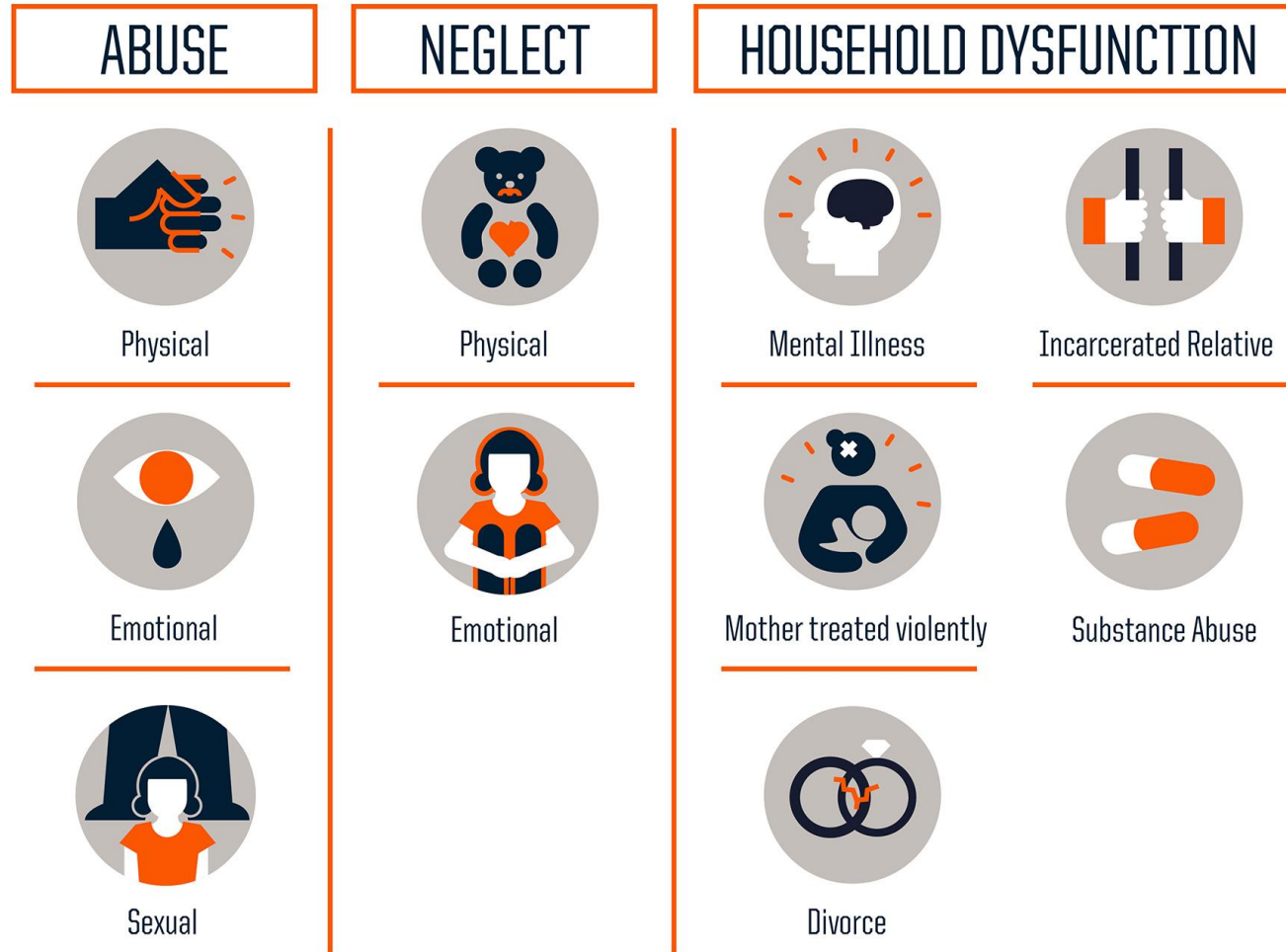


EMOTIONAL



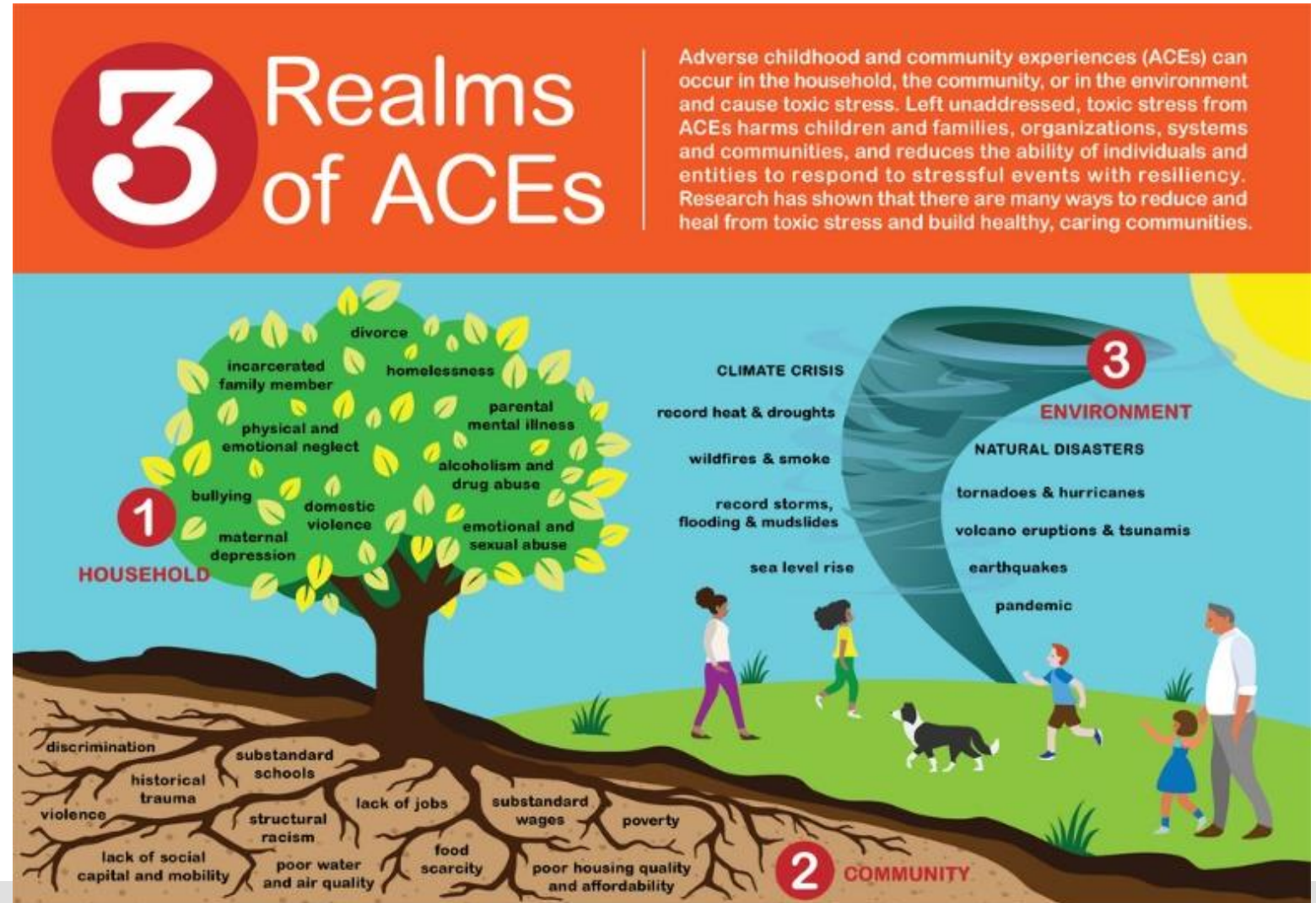
BEHAVIORAL

Adverse Childhood Experiences (ACEs)



The Realms of ACEs

- 1 Household
- 2 Community
- 3 Environment



Thanks to Building Community Resilience Collaborative and Networks and the International Transformational Resilience Coalition for inspiration and guidance. Please visit [ACESConnection.com](https://www.acesconnection.com) to learn more about the science of ACEs and join the movement to prevent ACEs, heal trauma and build resilience.

ACEs Can Have Lasting Effects On...



Health (obesity, diabetes, depression, suicide attempts, STDs, heart disease, cancer, stroke, COPD, broken bones)

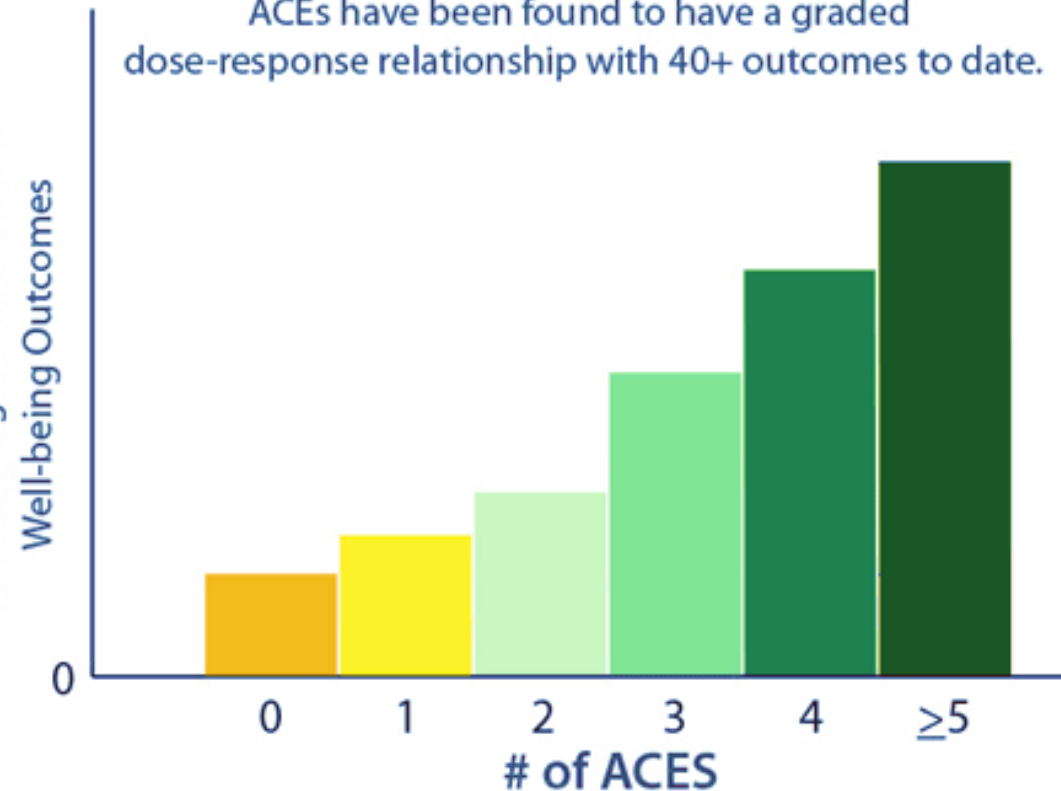


Behaviors (smoking, alcoholism, drug use)

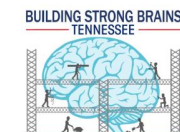


Life Potential (graduation rates, academic achievement, lost time from work)

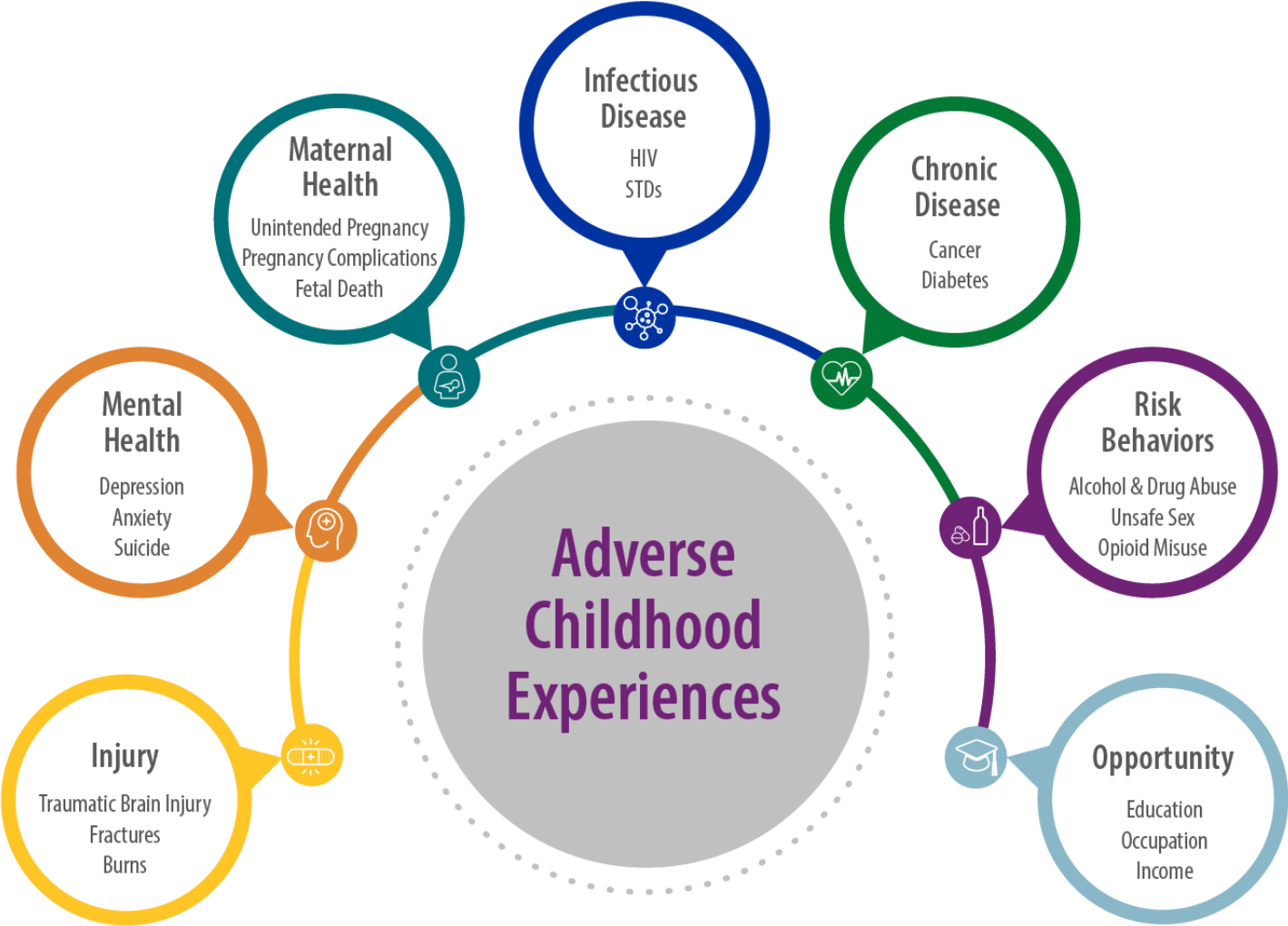
ACEs have been found to have a graded dose-response relationship with 40+ outcomes to date.



*This pattern holds for the 40+ outcomes, but the exact risk values vary depending on the outcome.

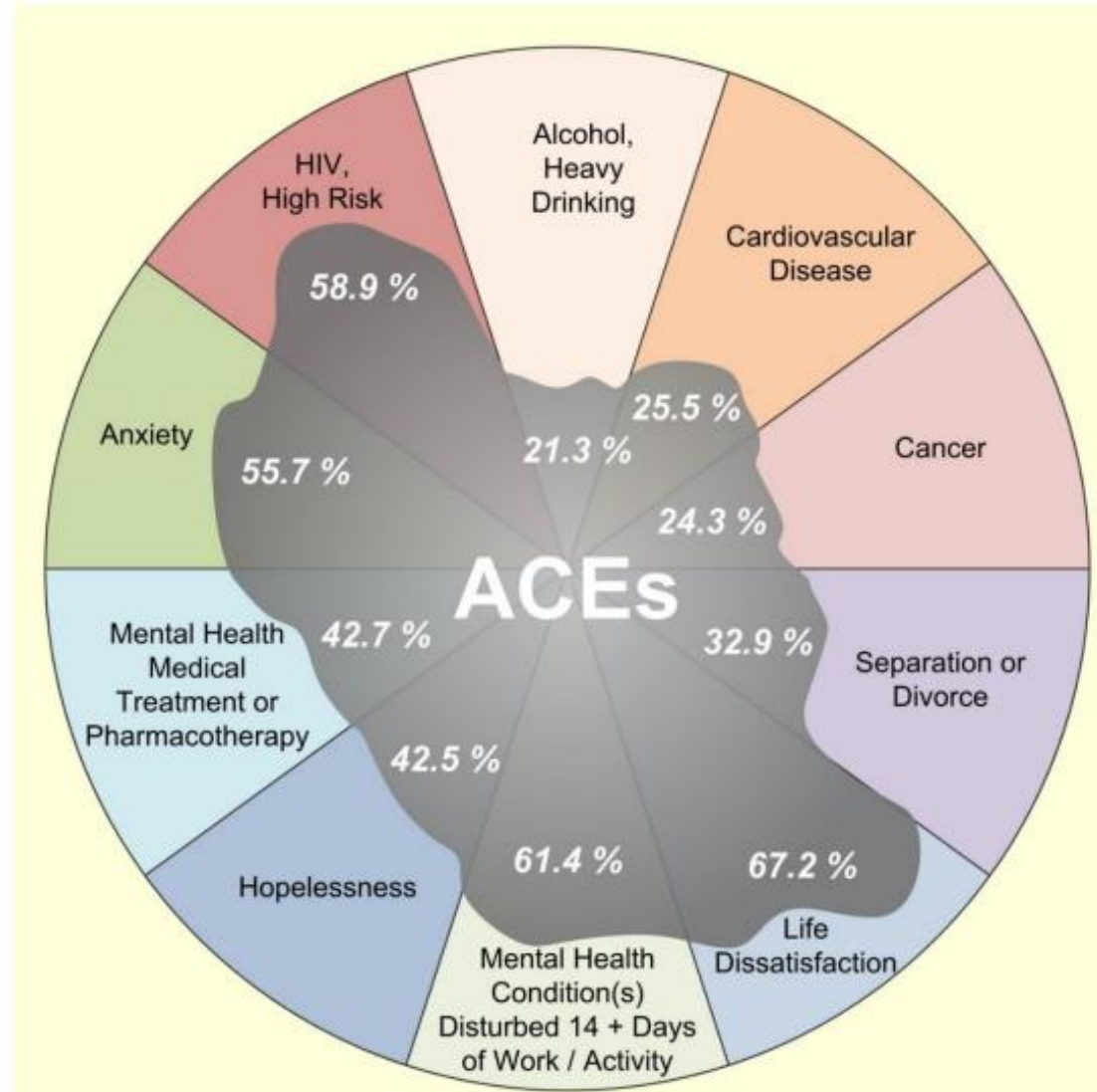


Outcomes of ACEs



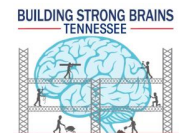
ACES are associated with increased risk to overall health and wellbeing outcomes across the lifespan

ACEs Compromise Community Prosperity

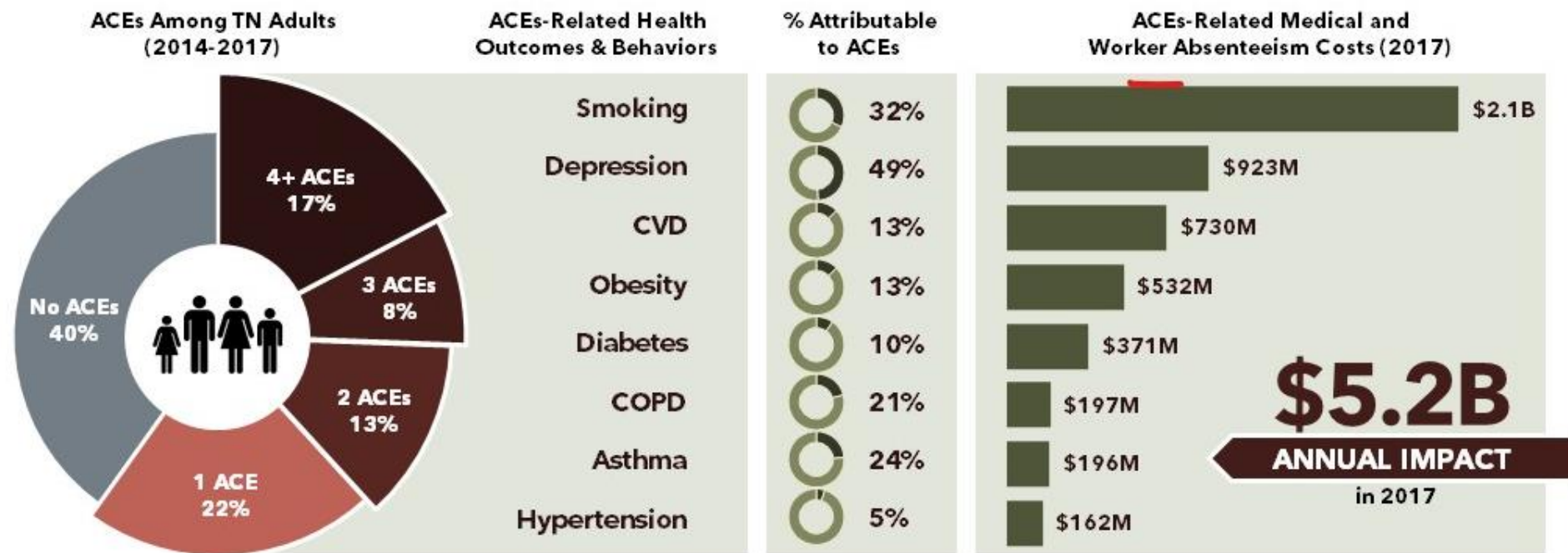


*based on an ACE score of 4+

Source: ACE Response, n.d.



The Annual Economic Impact of Adverse Childhood Experiences in Tennessee is 5.2 Billion



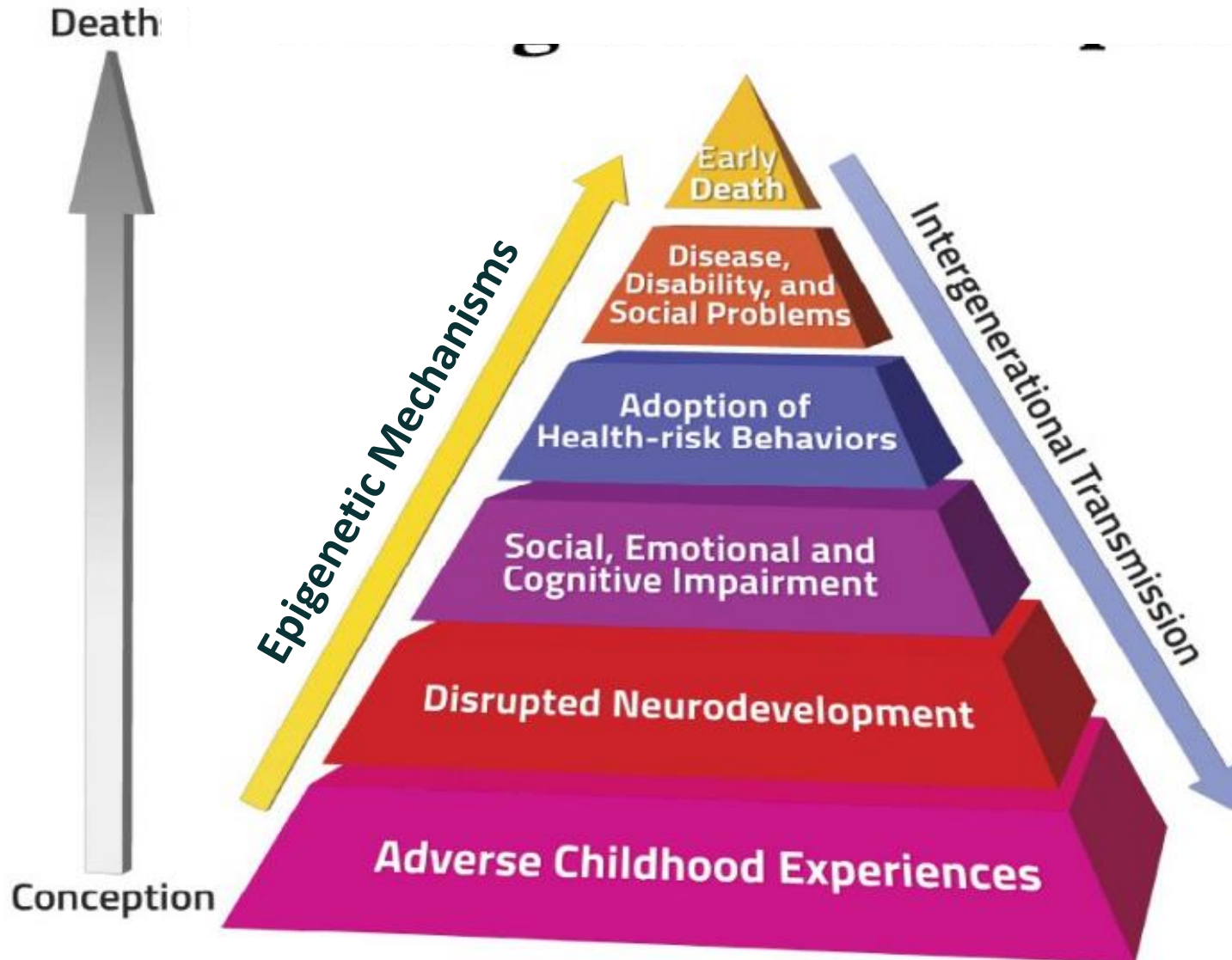
Note: Obesity-related costs include only direct medical costs.

Source: The Sycamore Institute's analysis of data from the 2014-2017 CDC BRFSS provided by the TN Department of Health, the CDC Chronic Disease Calculator, Trogdon et al. 2012, CDC SAMMEC, and Ford et al. 2014

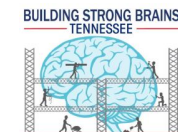
Source: Sycamore Institute, 2019



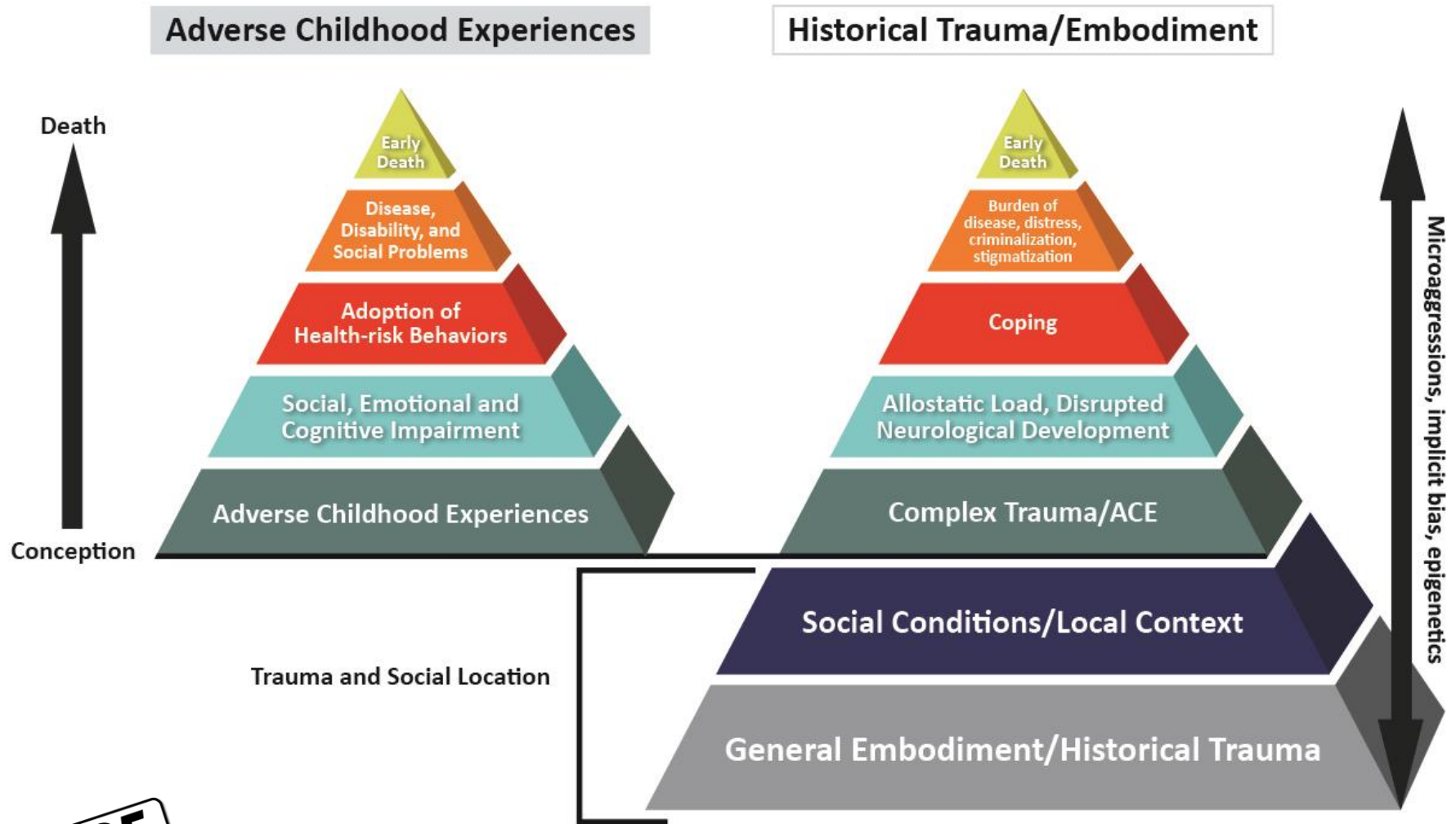
Mechanisms by Which Adverse Childhood Experiences Influence Health and Well-being Throughout the Lifespan



Source: Anda, n.d.



Trauma and Social Location



Positive Childhood Experiences

Positive childhood experiences (PCEs) are experiences in childhood that relate to children's ability to have safe, stable, nurturing, and equitable relationships and environments. PCEs can help children develop a sense of belonging, connectedness, and build resilience



SAFE



STABLE



NURTURING

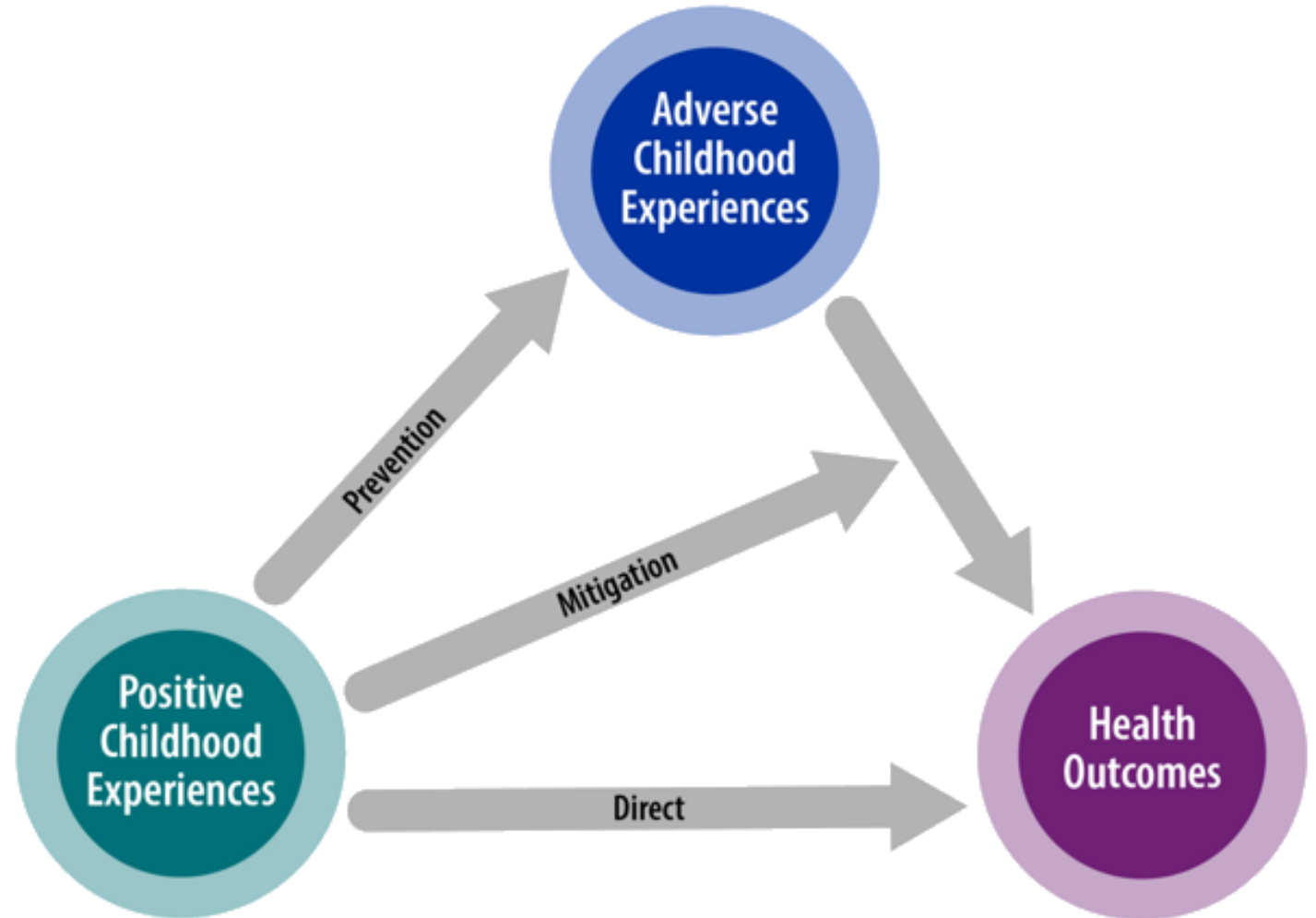


EQUITABLE

Having a parent with whom child feels safe
Engagement with school and in the community
Engaging in a hobby
Parent has sufficient social support
Secure attachment
Having a mentor
Availability of culturally appropriate, effective mental & behavioral health services
to parent
Access to opportunities to learn
Living in a clean home with enough food
Access to quality, affordable education
Having goals and/or academic motivation
Having beliefs that give comfort
Access to affordable, safe housing
Positive parent well-being and overall health
Opportunities to engage in community's traditions
Having a best friend
Ability to engage in help-seeking
Sense of community or cultural belonging
Opportunities to have fun
Unconditional love and support from a parent
Ability to regulate one's emotions
Living in a safe neighborhood or community
Age-appropriate parental monitoring
Access to green spaces & places to play
Having daily routines & consistent, fair rules
Regular physical activity
Having a parent with whom child feels close
Development of positive coping strategies
Low alcohol outlet density
Having prosocial peers
Belonging at school
Opportunity to engage in community traditions, including Native culture engagement
Positive self-esteem
Being part of a social group
Availability and access to high quality medical and dental care

PCEs Influence Health

PCEs influence health throughout the lifespan through **prevention of ACEs, mitigation of ACEs impact, and direct impact on health.**



PCEs Scale – Bethell et al.

1. Felt able to talk to family about feelings
2. Felt their family stood by them during difficult times
3. Enjoyed participating in community traditions
4. Felt a sense of belonging in high school
5. Felt supported by friends
6. Had a least 2 non-parent adults who took genuine interest in them
7. Felt safe and protected by an adult in their home

PCEs Buffer ACEs and Promote Adult Health

6-7 vs. 0-2 PCEs: Adults reporting 6-7 PCEs have **72% lower odds** of having depression or poor mental health compared to those reporting 0-2 PCEs.

48% v. 12.6%, OR 0.28; 95% CI 0.21-0.39. 3.8x higher rate for 0-2 vs. 6-7 PCEs.



PCEs Buffer ACEs and Promote Adult Health

6-7 vs 3-5 PCEs: Adults with 6-7 PCEs have **50% lower odds** of adult depression or poor mental health compared to those with 3-5 PCEs

25% v. 12.6%, OR 0.50; 95% CI 0.36-0.69. 1.98x higher rate for 3-5 vs. 6-7 PCEs.



American Academy of Pediatrics Framework

Toxic Stress



Relational Health

FROM THE AMERICAN ACADEMY OF PEDIATRICS | POLICY STATEMENT | AUGUST 01 2021

Preventing Childhood Toxic Stress: Partnering With Families and Communities to Promote Relational Health

Andrew Garner, MD, PhD, FAAP;

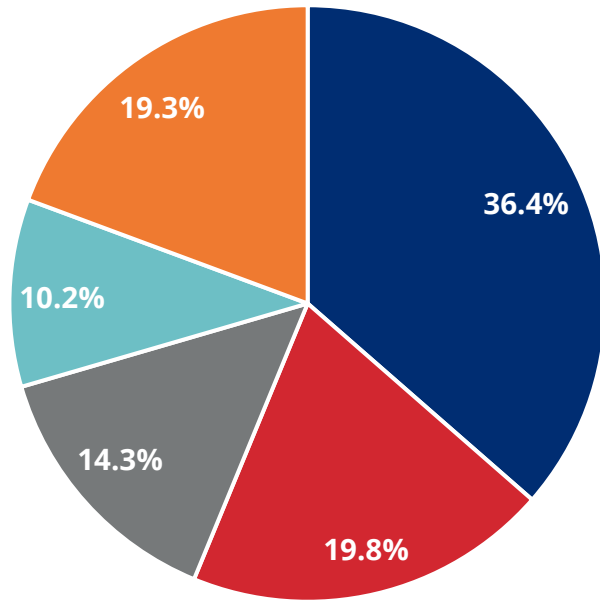
Michael Yogman, MD, FAAP COMMITTEE ON PSYCHOSOCIAL ASPECTS OF CHILD AND FAMILY HEALTH,
SECTION ON DEVELOPMENTAL AND BEHAVIORAL PEDIATRICS, COUNCIL ON EARLY CHILDHOOD



ACEs and PCEs in Tennessee

ACEs in Tennessee

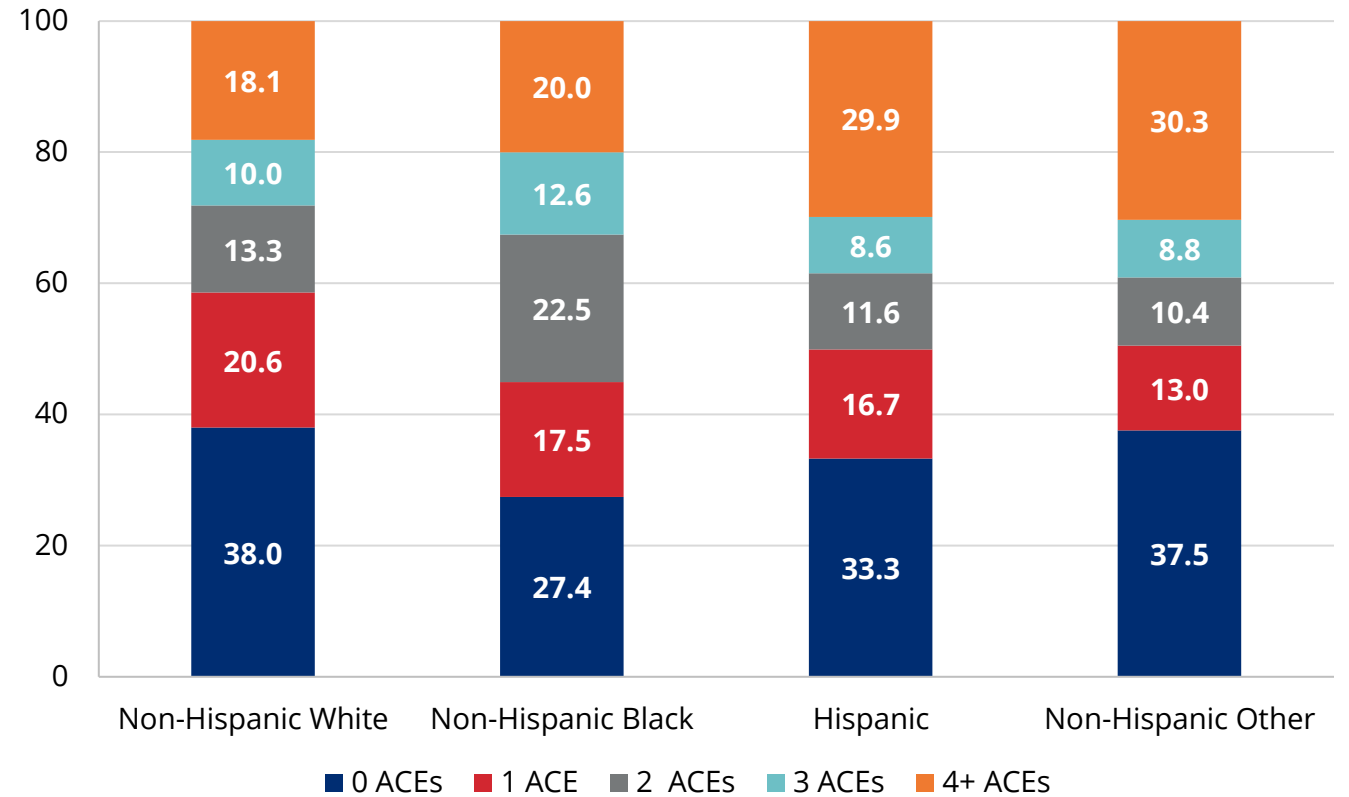
Percentage of ACEs Experienced



Source: Tennessee BRFSS, 2020

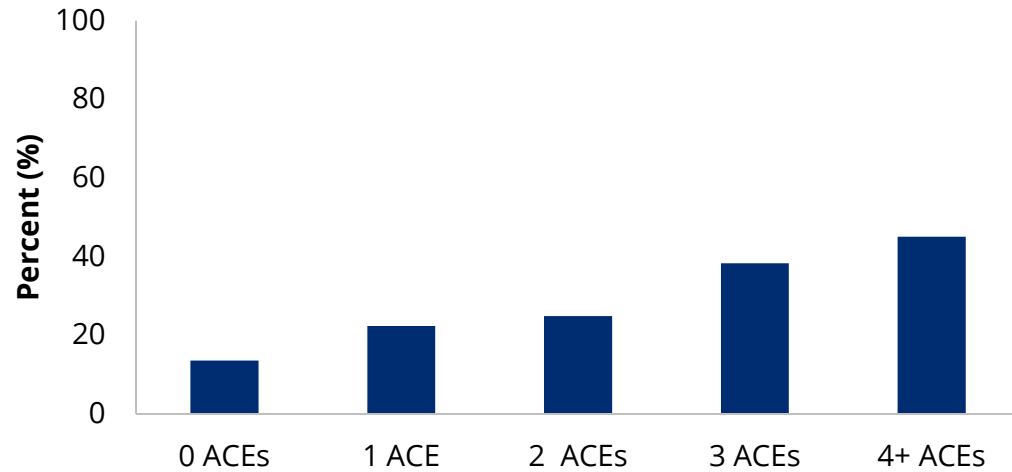
■ 0 ■ 1 ■ 2 ■ 3 ■ 4+

ACEs by Race and Ethnicity

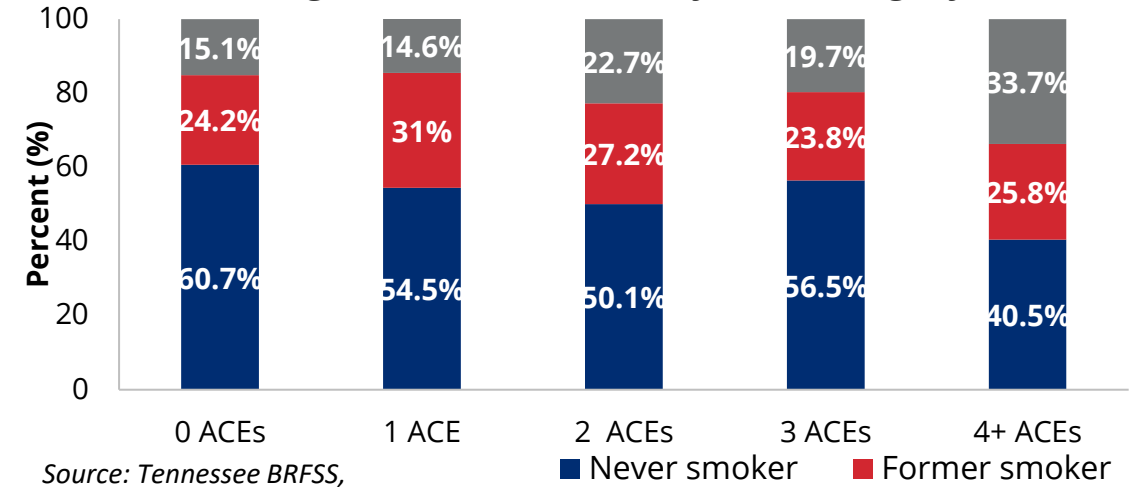


Tennessee ACEs and Health

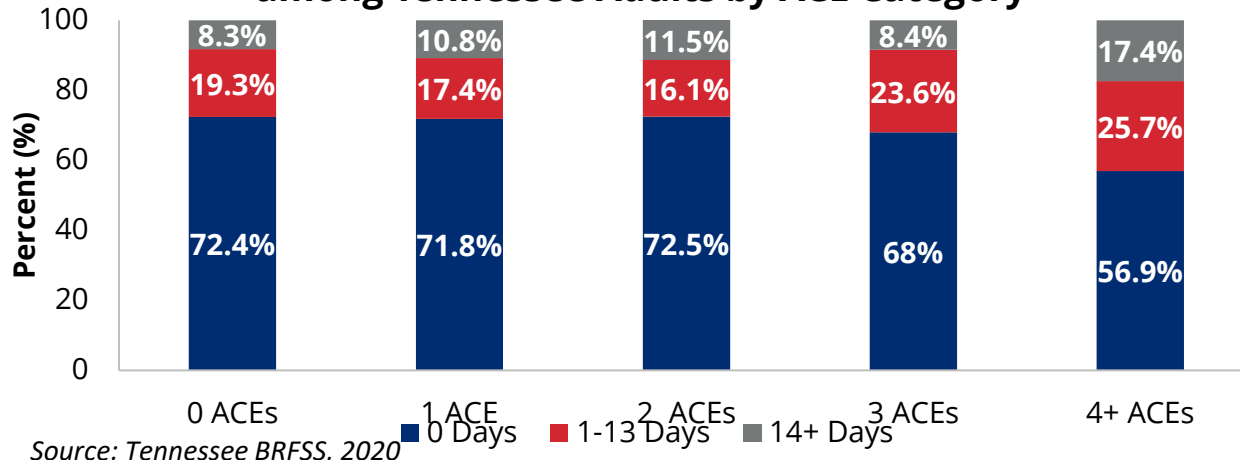
Ever Diagnosed with Depressive Disorder among Tennessee Adults by ACE Category



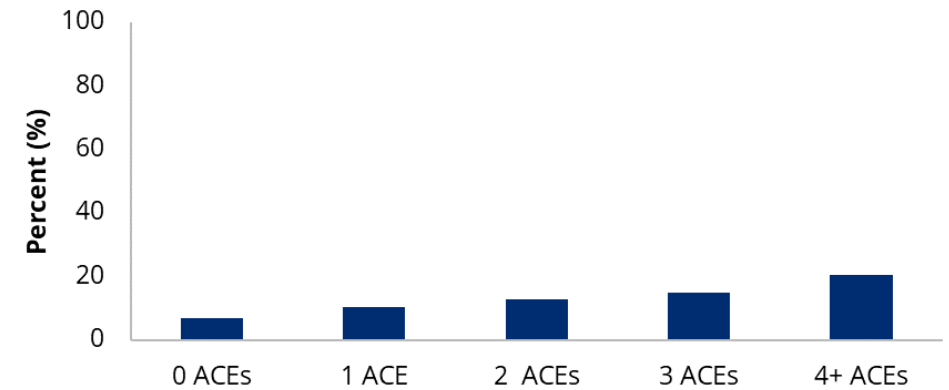
Current Smoking Status among Tennessee Adults by ACE Category



Days with Poor Physical Health in the Last 30 Days among Tennessee Adults by ACE Category



Delayed Care Due to Medical Cost among Tennessee Adults by ACE Category

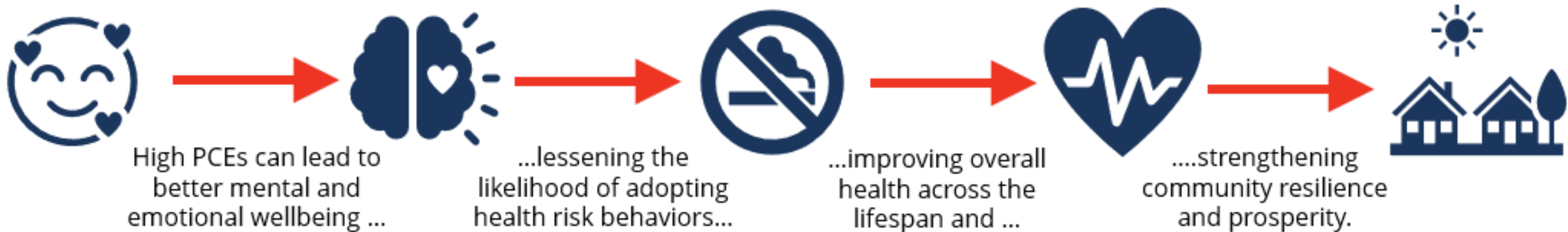


Source: Tennessee BRFSS, 2020



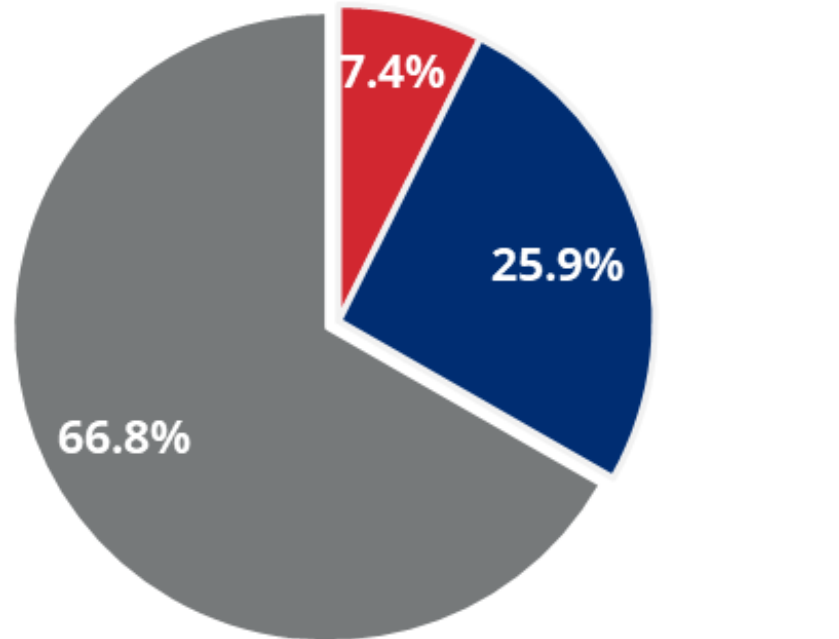
TN BRFSS Data

- Data collection from the 2021 Behavioral Risk Factor Surveillance System (BRFSS)
- Representative sample of adult Tennesseans
- Bethell PCEs Scale included at conclusion of the phone survey



PCEs Prevalence in TN

Percentage of PCEs Experienced



Source: Tennessee BRFSS, 2021

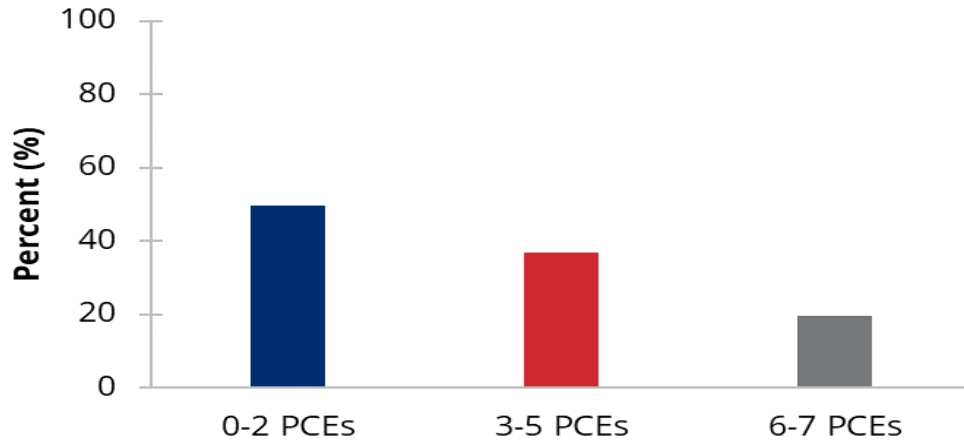
■ 0-2 ■ 3-5 ■ 6-7

Most reported feeling **safe and supported at home** and **by their friends** while growing up. In fact, **nearly half of adults reported experiencing all 7**. Only 7.4% reported 2 or fewer PCEs.

The least common PCE was “*I felt a sense of belonging in high school*” (71.3%).

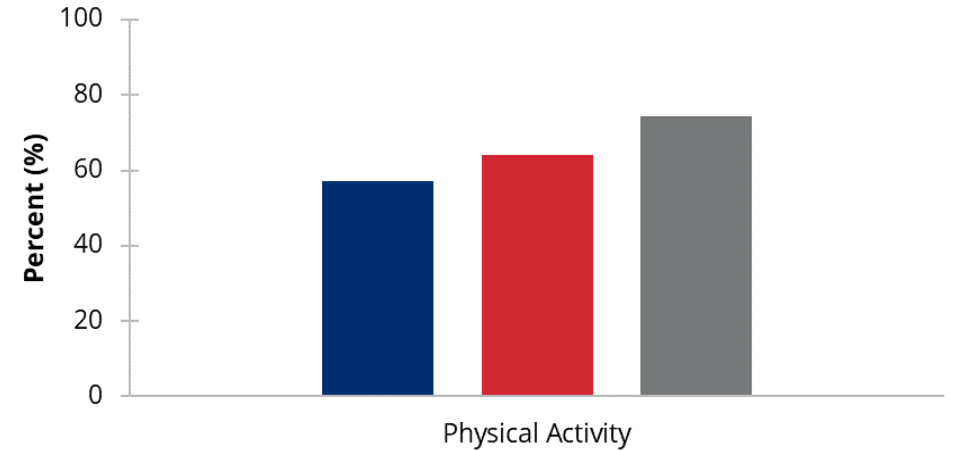
Tennessee PCEs and Health

Ever Diagnosed with Depression



Source: Tennessee BRFSS, 2021

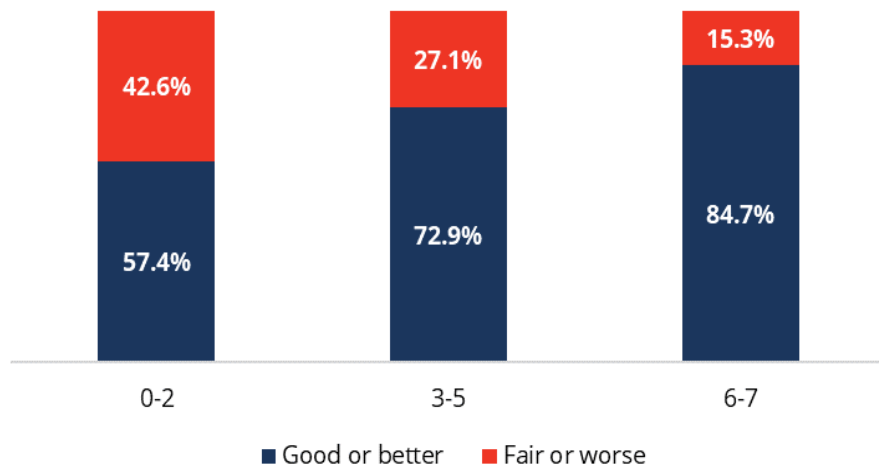
Physical Activity



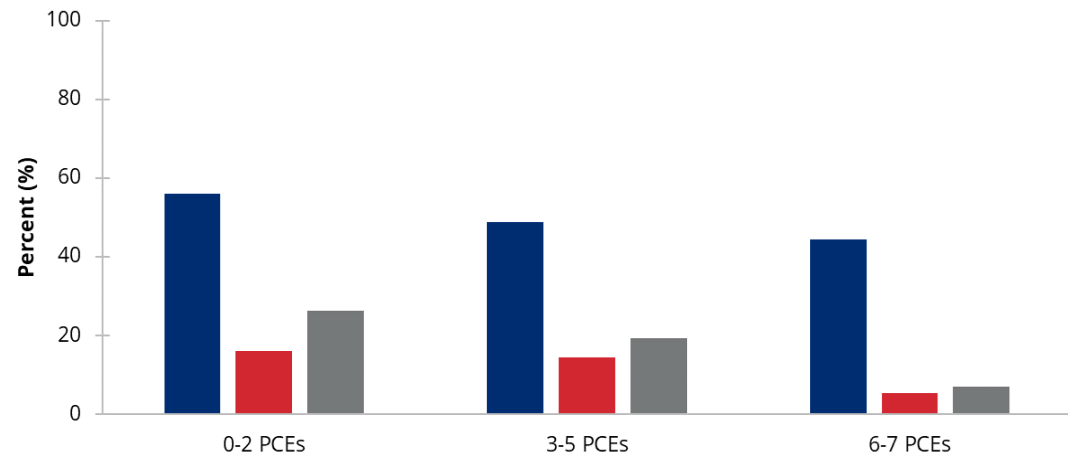
Source: Tennessee BRFSS, 2021

■ 0-2 PCEs ■ 3-5 PCEs ■ 6-7 PCEs

Self-Reported Health Status



Healthcare Access: Employment, Insurance, and Delayed Care



Source: Tennessee BRFSS, 2021

■ Unemployed ■ Uninsured ■ Delayed Care Due to Cost





Strategies for Action

Public Health Implications

**High PCEs
scores
improve
resilience,
well-being,
and prosperity
for us all.**



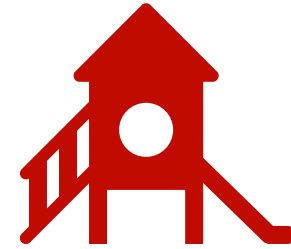
Strategies for Action



**Teach Relationship
and Self-Regulation
Skills**



**Focus on whole-
person wellness**



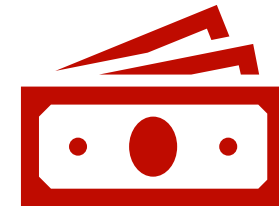
**Support early
childhood programs**



**Support mentorship,
civic, arts, and cultural
program for kids**

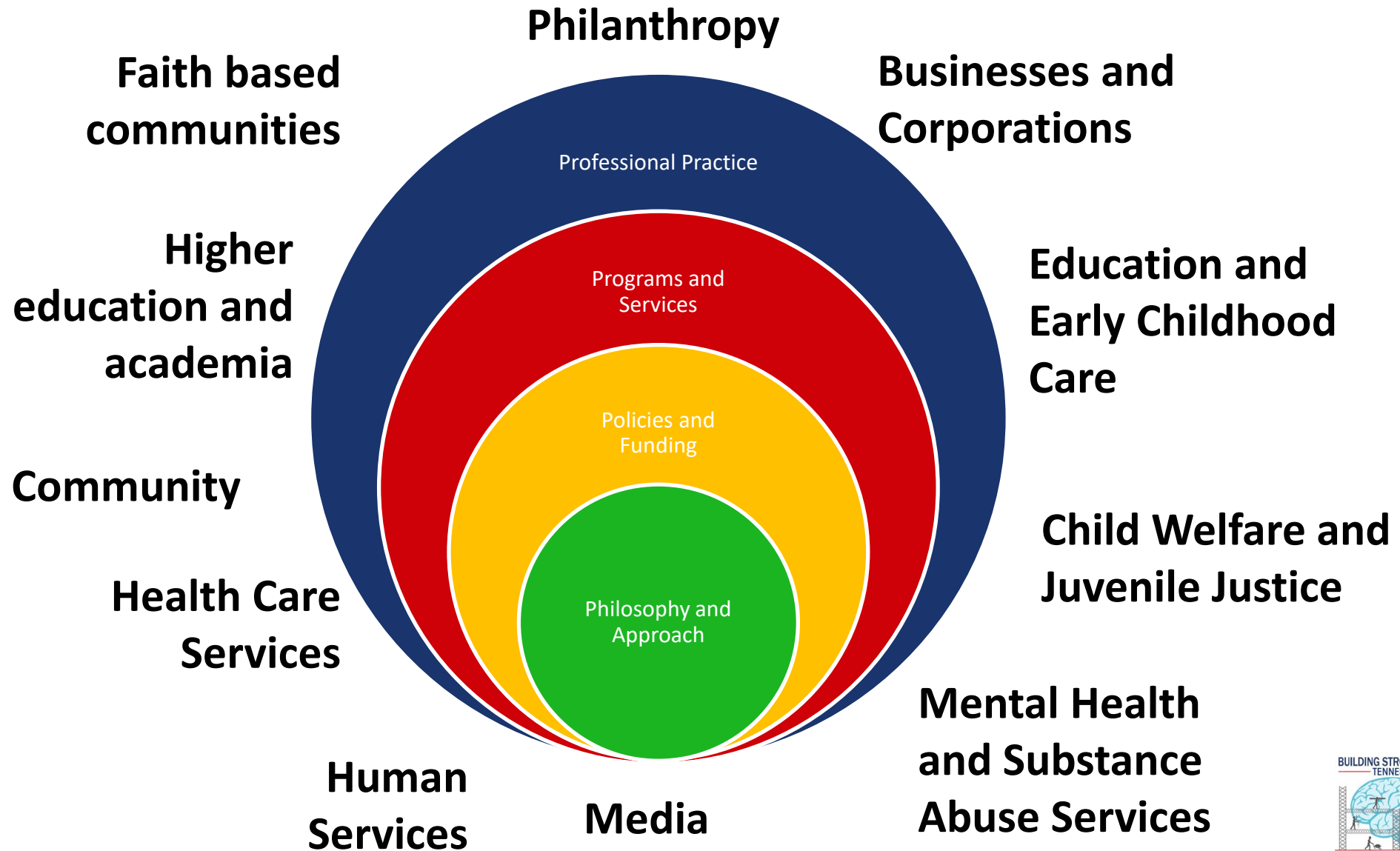


**Collaborate across
sectors for policy and
systems change**



**Improve economic
support for families**

Anticipated Multi-Sector, Multi-Level Public and Private Impacts



Relationships Impact Health at Any Age

**“The surprising finding is that our relationships and how happy we are in our relationships has a powerful influence on our health”-
Robert Waldinger, PhD**

The Harvard Study of Adult
Development



Questions?

Thank you!



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