

# Adverse Childhood Experiences Study

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(See also: <https://www.cdc.gov/violenceprevention/acestudy/index.html> )

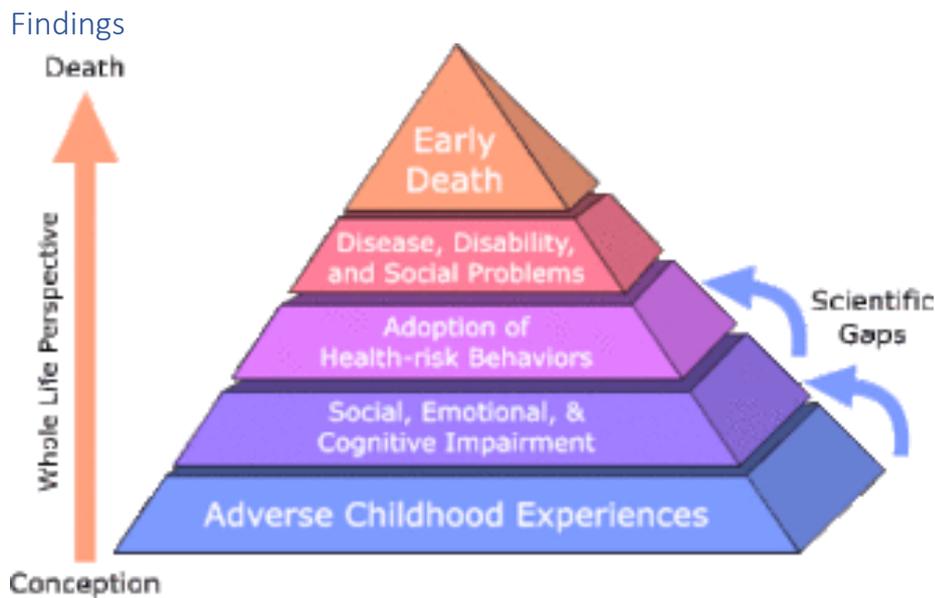
The **Adverse Childhood Experiences Study (ACE Study)** is a research study conducted by the American [health maintenance organization Kaiser Permanente](#) and the [Centers for Disease Control and Prevention](#).<sup>[1]</sup> Participants were recruited to the study between 1995 and 1997 and have been in long-term follow up for health outcomes. The study has demonstrated an association of adverse childhood experiences (ACEs) with health and social problems as an adult. The study is frequently cited as a notable landmark in [epidemiological](#) research,<sup>[2]</sup> and has produced more than 50 scientific articles and more than 100 conference and workshop presentations that look at the prevalence and consequences of ACEs.<sup>[1][non-primary source needed]</sup>

## Background

In the 1980s, the dropout rate of participants at [Kaiser Permanente's obesity clinic in San Diego, California](#), was about 50%; despite all of the dropouts successfully [losing weight](#) under the program.<sup>[3]</sup> Vincent Felitti, head of Kaiser Permanente's Department of Preventive Medicine in San Diego, conducted interviews with people who had left the program, and discovered that a majority of 286 people he interviewed had experienced [childhood sexual abuse](#). The interview findings suggested to Felitti that weight gain might be a coping mechanism for [depression](#), [anxiety](#), and [fear](#).<sup>[3]</sup>

Felitti and Robert Anda from the [Centers for Disease Control and Prevention](#) (CDC) went on to survey childhood [trauma](#) experiences of over 17,000 Kaiser Permanente patient volunteers.<sup>[3]</sup> The 17,337 participants were volunteers from approximately 26,000 consecutive Kaiser Permanente members. About half were female; 74.8% were white; the average age was 57; 75.2% had attended college; all had jobs and good health care, because they were members of the Kaiser [health maintenance organization](#).<sup>[4]</sup> Participants were asked about 10 types of childhood trauma that had been identified in earlier research literature:<sup>[5]</sup>

- [Physical abuse](#)
- Sexual abuse
- [Emotional abuse](#)
- Physical [neglect](#)
- Emotional neglect
- Mother treated violently
- Household [substance abuse](#)
- Household [mental illness](#)
- Parental [separation](#) or [divorce](#)
- [Incarcerated](#) household member



The ACE Pyramid represents the conceptual framework for the ACE Study, which has uncovered how adverse childhood experiences are strongly related to various risk factors for disease throughout the lifespan, according to the [Centers for Disease Control and Prevention](#).<sup>[6][7]</sup>

According to the United States' [Substance Abuse and Mental Health Services Administration](#), the ACE study found that:

- [Adverse childhood experiences](#) are common. For example, 28% of study participants reported physical abuse and 21% reported sexual abuse. Many also reported experiencing a divorce or parental separation, or having a parent with a mental and/or [substance use disorder](#).<sup>[8]</sup>
- Adverse childhood experiences often occur together. Almost 40% of the original sample reported two or more ACEs and 12.5% experienced four or more. Because ACEs occur in clusters, many subsequent studies have examined the cumulative effects of ACEs rather than the individual effects of each.<sup>[8]</sup>
- Adverse childhood experiences have a [dose–response relationship](#) with many health problems. As researchers followed participants over time, they discovered that a person's cumulative ACEs score has a strong, graded relationship to numerous health, [social](#), and behavioral problems throughout their lifespan, including substance use disorders. Furthermore, many problems related to ACEs tend to be [comorbid](#), or co-occurring.<sup>[8]</sup>

About two-thirds of individuals reported at least one adverse childhood experience; 87% of individuals who reported one ACE reported at least one additional ACE.<sup>[5]</sup> The number of ACEs was strongly associated with adulthood high-risk health behaviors such as smoking, alcohol and drug abuse, promiscuity, and severe obesity, and correlated with ill-health including depression, [heart disease](#), [cancer](#), [chronic lung disease](#) and shortened lifespan.<sup>[5][9][10]</sup> Compared to an ACE score of zero, having four adverse childhood experiences was associated with a seven-fold (700%) increase in [alcoholism](#), a doubling of risk of being diagnosed with cancer, and a four-fold increase in [emphysema](#); an ACE score above six was associated with a 30-fold (300%) increase in attempted suicide.<sup>[2]</sup>

The ACE study's results suggest that maltreatment and [household dysfunction](#) in childhood contribute to health problems decades later. These include [chronic](#) diseases—such as heart disease, cancer, [stroke](#), and [diabetes](#)—that are the most common causes of death and

[disability](#) in the [United States](#).<sup>[11]</sup> The study's findings, while relating to a specific population within the United States, might reasonably be assumed to reflect similar trends in other parts of the world, according to the [World Health Organization](#).<sup>[11]</sup>

## Subsequent surveys

The ACE Study has produced more than 50 articles that look at the prevalence and consequences of ACEs.<sup>[12]</sup><sup>[non-primary source needed]</sup> It has been influential in several areas. Subsequent studies have confirmed the high frequency of adverse childhood experiences, or found even higher incidences in urban or youth populations.

The original study questions have been used to develop a 10-item [screening](#) questionnaire.<sup>[13]</sup><sup>[14]</sup> Numerous subsequent surveys have confirmed that adverse childhood experiences are frequent.

The CDC runs the [Behavioral Risk Factor Surveillance System](#) (BRFSS),<sup>[15]</sup> an annual survey conducted by individual state health departments in all 50 states. An expanded survey instrument in several states found each state to be similar.<sup>[16]</sup> Some states have collected additional local data.<sup>[17]</sup><sup>[18]</sup> Adverse childhood experiences were even more frequent in studies in urban Philadelphia<sup>[19]</sup> and in a survey of young mothers (mostly younger than 19).<sup>[20]</sup> Internationally, an ACE International Questionnaire (ACE-IQ) is undergoing [validation testing](#).<sup>[21]</sup> Surveys of adverse childhood experiences have been conducted in Romania,<sup>[22]</sup> the Czech Republic,<sup>[23]</sup> the Republic of Macedonia,<sup>[24]</sup> Norway, the Philippines, the United Kingdom, Canada, China and Jordan.<sup>[7]</sup><sup>[not specific enough to verify]</sup> Child Trends used data from the 2011/12 National Survey of Children's Health (NSCH) to analyze ACEs prevalence in children nationally, and by state. The NSCH's list of "adverse family experiences" includes a measure of economic hardship and shows that this is the most common ACE reported nationally.<sup>[25]</sup>

## Neurobiology of stress

See also: [Social stress](#) and [Stress in early childhood](#)

Cognitive and neuroscience researchers have examined possible mechanisms that might explain the negative consequences of adverse childhood experiences on adult health.<sup>[26]</sup> Adverse childhood experiences can alter the structural [development](#) of neural networks and the [biochemistry](#) of [neuroendocrine systems](#)<sup>[27]</sup><sup>[28]</sup><sup>[29]</sup><sup>[30]</sup> and may have long-term effects on the body, including speeding up the processes of disease and aging and compromising immune systems.<sup>[31]</sup><sup>[32]</sup><sup>[33]</sup>

Additionally, [epigenetic](#) transmission may occur due to stress during pregnancy or during interactions between mother and newborns. Maternal stress, depression, and exposure to partner violence have all been shown to have epigenetic effects on infants.<sup>[30]</sup>

## Implementing practices

As knowledge about the prevalence and consequences of adverse childhood experiences increases, trauma-informed and resilience-building practices based on the research is being implemented in communities, education, public health departments, social services, faith-based organizations and criminal justice. A few states are considering legislation.

## Communities

As knowledge about the prevalence and consequences of ACEs increases, more communities seek to integrate trauma-informed and resilience-building practices into their agencies and systems. Tarpon Springs, Florida, became the first trauma-informed community in 2011.<sup>[34][35]</sup> Trauma-informed initiatives in Tarpon Springs include trauma-awareness training for the local housing authority, changes in programs for ex-offenders, and new approaches to educating students with learning difficulties.<sup>[36]</sup>

## Education

Children who are exposed to adverse childhood experiences may become overloaded with stress hormones, leaving them in a constant state of arousal and alertness to environmental and relational threats. Therefore, they may have difficulty focusing on school work, and consolidating new memory, making it harder for them to learn at school.<sup>[37]</sup> Approximately one in three or four children have experienced significant ACEs.<sup>[38]</sup> A study by the Area Health Education Center of Washington State University found that students with at least three ACEs are three times as likely to experience academic failure, six times as likely to have behavioral problems, and five times as likely to have attendance problems.<sup>[38]</sup> These students may have trouble trusting teachers and other adults, and may have difficulty creating and maintaining relationships.<sup>[39]</sup> The trauma-informed school movement aims to train teachers and staff to help children self-regulate, and to help families that are having problems that result in children's normal response to trauma, rather than simply jumping to punishment. It also seeks to provide behavioral consequences that will not re-traumatize a child. Punishment is often ineffective, and better results can often be achieved with positive reinforcement.<sup>[40]</sup> Out-of-school suspensions can be particularly bad for students with difficult home lives; forcing students to remain at home may increase their distrust of adults.<sup>[citation needed]</sup>

Trauma-sensitive, or compassionate, schooling has become<sup>[when?]</sup> increasingly popular in Washington, Massachusetts, and California. Lincoln High School in Walla Walla, Washington, adapted a trauma-informed approach to discipline and reduced its suspensions by 85%.<sup>[41]</sup> Rather than standard punishment, students are taught to recognize their reaction to stress and learn to control it. Spokane, Washington, schools conducted a research study that demonstrated that academic risk was correlated with students' experiences of traumatic events known to their teachers.<sup>[38][42]</sup> The same school district has begun a study to test the impact of trauma-informed intervention programs, in an attempt to reduce the impact of [toxic stress](#). In Brockton, Massachusetts, a community-wide meeting led to a trauma-informed approach being adopted by the Brockton School District.<sup>[40]</sup> So far, all of the district's elementary schools have implemented trauma-informed improvement plans, and there are plans to do the same in the middle school and high school. About one-fifth of the district teachers have participated in a course on teaching traumatized students. Police alert schools when they have arrested someone or visited at a student's address. Massachusetts state legislation has sought to require all schools to develop plans to create "safe and supportive schools".<sup>[40]</sup> At El Dorado, an elementary school in San Francisco, California, trauma-informed practices were associated with a suspension reduction of 89%.<sup>[43]</sup>

## Social services

Social service providers—including welfare systems, housing authorities, homeless shelters, and [domestic violence](#) centers – are adopting trauma-informed approaches that help to prevent ACEs or minimize their impact. Utilizing tools that screen for trauma can help a social service worker direct their clients to interventions that meet their specific needs.<sup>[44]</sup> Trauma-informed practices can also help social service providers look at how trauma impacts the whole family.<sup>[45]</sup>

Trauma-informed approaches can improve child welfare services by 1) openly discussing trauma and 2) addressing parental trauma.<sup>[according to whom?][46]</sup> The New Hampshire Division for Children Youth and Families (DCYF) is taking a trauma-informed approach to their foster care services by educating staff about childhood trauma, screening children entering foster care for trauma, using trauma-informed language to mitigate further traumatization, mentoring birth parents and involving them in collaborative parenting, and training foster parents to be trauma-informed.<sup>[44]</sup>

In Albany, New York the HEARTS Initiative has led to local organizations developing trauma-informed practice.<sup>[46]</sup> Senior Hope Inc., an organization serving adults over the age of 50, began implementing the 10-question ACE survey and talking with their clients about childhood trauma. The LaSalle School, which serves orphaned and abandoned boys, began looking at delinquent boys in from a trauma-informed perspective and began administering the ACE questionnaire to their clients.

Housing authorities are also becoming trauma-informed. Supportive housing can sometimes recreate control and power dynamics associated with clients' early trauma.<sup>[47]</sup> This can be reduced through trauma-informed practices, such as training staff to be respectful of clients' space by scheduling appointments and not letting themselves into clients' private spaces, and also understanding that an aggressive response may be trauma-related coping strategies.<sup>[47]</sup> The housing authority in Tarpon Springs provided trauma-awareness training to staff so they could better understand and react to their clients' stress and anger resulting from poor employment, health, and housing.<sup>[36]</sup>

A survey of 200 homeless individuals in California and New York demonstrated that more than 50% had experienced at least four ACEs.<sup>[48]</sup> In Petaluma, California, the Committee on the Shelterless (COTS) uses a trauma-informed approach called Restorative Integral Support (RIS) to reduce intergenerational homelessness.<sup>[49]</sup> RIS increases awareness of and knowledge about ACEs, and calls on staff to be compassionate and focus on the whole person. COTS now consider themselves ACE-informed and focus on resiliency and recovery.

## Health care services

Screening for or talking about ACEs with parents and children can help to foster healthy physical and psychological development and can help doctors understand the circumstances that children and their parents are facing. By screening for ACEs in children, pediatric doctors and nurses can better understand behavioral problems. Some doctors have questioned whether some behaviors resulting in [attention deficit hyperactivity disorder](#) (ADHD) diagnoses are in fact reactions to trauma. Children who have experienced four or more ACEs are three times as likely to take ADHD medication when compared with children with less than four ACEs.<sup>[50]</sup> Screening parents for their ACEs allows doctors to provide the

appropriate support to parents who have experienced trauma, helping them to build resilience, foster attachment with their children, and prevent a family cycle of ACEs.<sup>[51][52]</sup> Trauma-informed pediatric care also allows doctors to develop a more trusting relationship with parents, opening the lines of communication.<sup>[53]</sup> At [Montefiore Medical Center](#) ACEs screenings will soon be implemented in 22 pediatric clinics. In a pilot program any child with one parent who has an ACE score of four or higher is offered enrollment and receive a variety of services. For families enrolled in the program parents report fewer ER visits and children have healthier emotional and social development, compared with those not enrolled.<sup>[51][54]</sup>

## Public health

Most American doctors as of 2015 do not use ACE surveys to assess patients. Objections to doing so include that there are no [randomized controlled trials](#) that show that such surveys can be used to actually improve health outcomes, there are no standard protocols for how to use the information gathered, and that revisiting negative childhood experiences could be emotionally traumatic.<sup>[55]</sup> Other obstacles to adoption include that the technique is not taught in medical schools, is not billable, and the nature of the conversation makes some doctors personally uncomfortable.<sup>[55]</sup>

Some public health centers see ACEs as an important way (especially for mothers and children)<sup>[56]</sup> to target health interventions for individuals during sensitive periods of development early in their life, or even in utero.<sup>[56]</sup> For example, Jefferson Country Public Health clinic in Port Townsend, Washington, now screens pregnant women, their partners, parents of children with special needs, and parents involved with CPS for ACEs.<sup>[57]</sup> With regard to patient counseling, the clinic treats ACEs like other health risks such as smoking or alcohol consumption.

## Resiliency



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Resilience is not a trait that people either have or do not have. It involves behaviors, thoughts and actions that can be learned and developed in anyone. According to the American Psychological Association (2017) resilience is the ability to adapt in the face of adversity, tragedy, threats or significant stress — such as family and relationship problems, serious health problems or workplace and financial stressors. Resilience refers to bouncing back from difficult experiences in life. There is nothing extraordinary about resilience. People often demonstrate resilience in times of adversity. However, being resilient does not mean that a person will not experience difficulty or distress as emotional pain is common for people when they suffer from a major adversity or trauma. In fact, the path to resilience often involves considerable emotional pain [70].

Resilience is labeled as a protective factor. Having resilience can benefit children who have been exposed to trauma and have a higher A.C.E score. Children who can learn to develop it, can use resilience to build themselves up after trauma. A child who has not developed resilience will have a harder time coping with the challenges that can come in adult life. People and children who are resilient, embrace the thinking that adverse experiences do not define who they are. They also can think about past events in their lives that were traumatic

and, try to reframe them in a way that is constructive. They are able to find strength in their struggle and ultimately can overcome the challenges and adversity that was faced in childhood. In childhood, resiliency can come from having a caring adult in a child's life. Resiliency can also come from having meaningful moments such as an academic achievement or getting praise from teachers or mentors. In adulthood, resilience is the concept of self-care. If you are taking care of yourself and taking the necessary time to reflect and build on your experiences, then you will have a higher capacity for taking care of others. Adults can also use this skill to counteract some of the trauma they have experienced. Self-care can mean a variety of things. One example of self-care, is knowing when you are beginning to feel burned out and then taking a step back to rest and recuperate yourself. Another component of self-care is practicing mindfulness or engaging in some form of meditation. If you are able to take them time to reflect upon your experiences, then you will be able to build a greater level of resiliency moving forward. All of these strategies put together can help to build resilience and counteract some of the childhood trauma that was experienced. With these strategies children can begin to heal after experiencing adverse childhood experiences. This aspect of resiliency is so important because it enables people to find hope in their traumatic past. When first looking at the A.C.E. study and the different correlations that come with having 4 or more traumas, it is easy to feel defeated. It is even possible for this information to encourage people to have unhealthy coping behaviors. Introducing resilience and the data that supports its positive outcome in regards to trauma, allows for a light at the end of a tunnel. It gives people the opportunity to be proactive instead of reactive when it comes to addressing the traumas in their past.

### Criminal justice

Since research suggests that incarcerated individuals are much more likely to have been exposed to violence and suffer from [posttraumatic stress disorder](#) (PTSD),<sup>[58]</sup> a trauma-informed approach may better help to address some of these criminogenic risk factors and can create a less traumatizing criminal justice experience.<sup>[according to whom?]</sup> Programs, like Seeking Safety, are often used to help individuals in the criminal justice system learn how to better cope with trauma, PTSD, and substance abuse.<sup>[59]</sup> Juvenile courts better help deter children from crime and delinquency when they understand the trauma many of these children have experienced.<sup>[60]</sup> The criminal justice system itself can also retraumatize individuals.<sup>[61]</sup> This can be prevented by creating safer facilities where correctional and police officers are properly trained to keep incidents from escalating.<sup>[58]</sup> Partnerships between police and mental health providers can also reduce the possible traumatizing effects of police intervention and help provide families with the proper mental health and social services.<sup>[62]</sup> The Women's Community Correctional Center of Hawaii began a Trauma-Informed Care Initiative that aims to train all employees to be aware and sensitive to trauma, to screen all women in their facility for trauma, to assess those who have experienced trauma, and begin providing trauma-informed mental health care to those women identified.<sup>[61]</sup>

### Faith-based organizations

Some faith-based organizations offer spiritual services in response to traumas identified by ACE surveys. For example, the founder of ACE Overcomers<sup>[63]</sup> combined the epidemiology of ACEs, the neurobiology of toxic stress and principles of the Christian [Bible](#) into a workbook and 12-week course used by [clergy](#) in several states.<sup>[64]</sup> Faith-based organizations also participate in the online group ACES Connection Network.<sup>[65]</sup> The Faith and Health

Connection ministry<sup>[66]</sup> also applies principles of [Christian theology](#) to address childhood traumas.

## Legislation

Vermont has passed a bill, Act 43(H.508), An act relating to building resilience for individuals experiencing adverse childhood experiences which acknowledges the life span affects of ACEs on health outcomes, seeks wide use of ACE screening by health providers and aims to educate medical and health school students about ACEs <http://legislature.vermont.gov/assets/Documents/2018/Docs/ACTS/ACT043/ACT043%20As%20Enacted.pdf>. "Vermont first state to propose bill to screen for ACEs in health care"], *ACEs Connection*, 18 March 2014</ref> Previously Washington State passed legislation to set up a public-private partnership to further community development of trauma-informed and resilience-building practices that had begun in that state; but it was not adequately funded.<sup>[67]</sup> On August 18, 2014, California lawmakers unanimously passed ACR No. 155, which encourages policies reducing children's exposure to adverse experiences.<sup>[68]</sup> Recent Massachusetts legislation supports a trauma-informed school movement as part of The Reduction of Gun Violence bill (No. 4376). This bill aims to create "safe and supportive schools" through services and initiatives focused on physical, social, and emotional safety.<sup>[69]</sup>

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