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1. THE PROBLEM | 2. INTERVENTION | 3. PREVENTION | 4. RECOGNITION

STARTING EARLY: THE PROBLEM

# THE LONG REACH OF CHILDHOOD TRAUMA

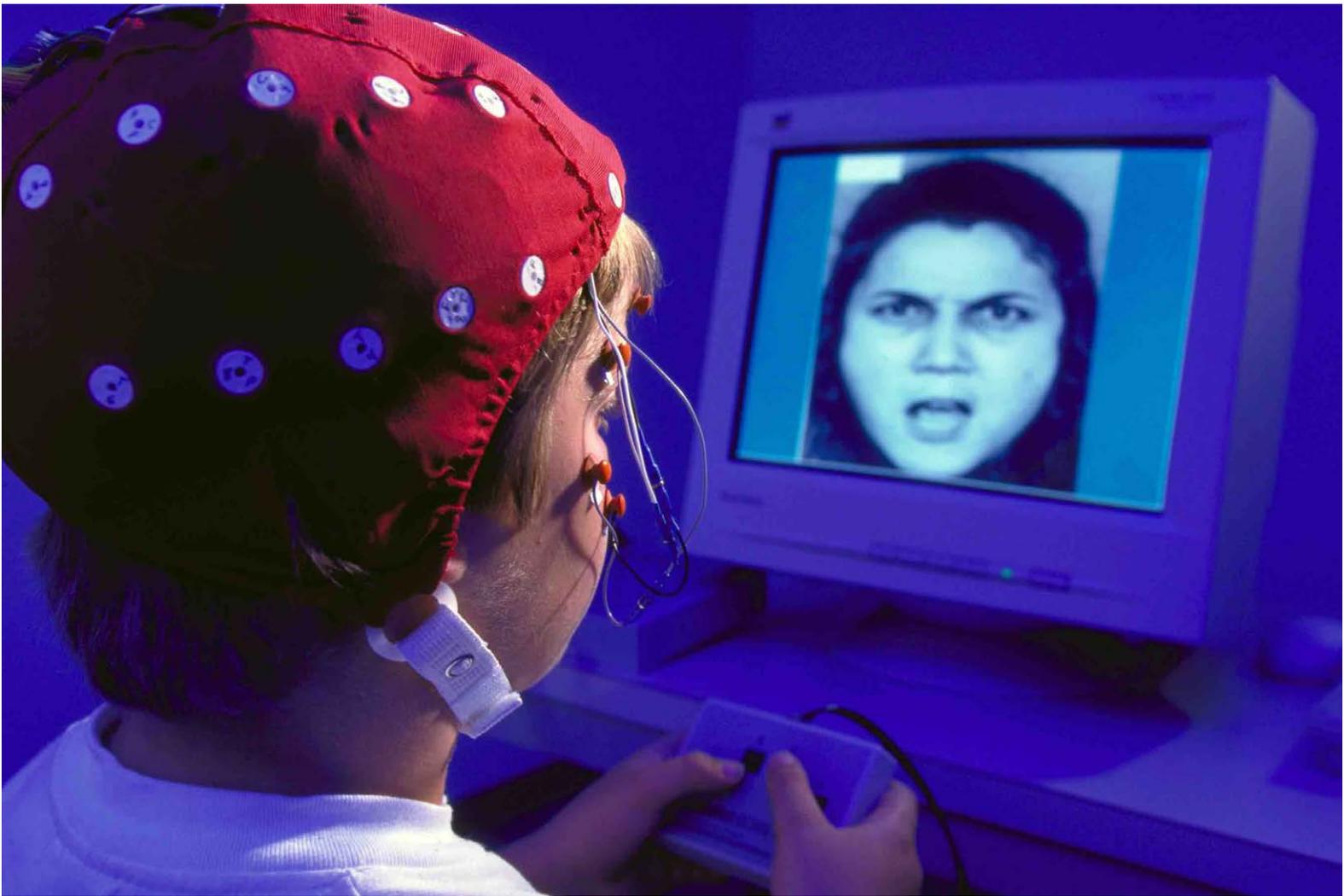
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*Research has linked exposure to abuse, neglect and other forms of severe adversity in childhood to a wide range of mental and physical diseases and disorders. Can understanding this make a profound change in the way we prevent illness?*

*The first article in a four-part series.*

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BY ARIELLE LEVIN BECKER



Researchers measured children's brain activity while viewing facial expressions. Children who were abused were more likely to view ambiguous faces as angry. (Courtesy of the Child Emotion Lab at the University of Wisconsin - Madison)

"We have this incredible proof about the expense that trauma is causing our society and how all of these physical ailments are related. And yet, what do you do to change it? It's not like, 'Well, eat more broccoli.' "

—Patricia Wilcox, head of the Traumatic Stress Institute at Klingberg Family Centers in New Britain

**T**he woman had dropped out of the weight-loss study. So had a frustratingly high number of other patients, most of whom seemed to be succeeding at losing weight before quitting. This confused Vincent J. Felitti, the doctor leading the 1980s study.

So he began interviewing the dropouts, using a series of questions designed to create a timeline of their lives

and weight history. The woman's answer to one of them would help set Felitti on a far different course, inspiring decades of work he'd never anticipated.

How much did you weigh when you became sexually active? Felitti asked.

"She said, '40 pounds,' started crying and blurted out, 'It was with my father,'" he recalled.

In his career as a physician and head of the department of preventive medicine at Kaiser Permanente in California, Felitti had rarely come across a patient with a history of incest. But by the end of 186 interviews, 55 percent of the obesity patients had reported being sexually abused. Worried he'd somehow biased the responses, Felitti asked five other people to interview another 100 patients. Their results were the same.

He was puzzled. Could this be possible?

Felitti's curiosity would eventually lead to a landmark study that found childhood abuse, household dysfunction and other forms of early life adversity were common – and linked to a greater risk for both mental health problems and physical illnesses, including heart disease and cancer.

It's hardly surprising that abuse and other hardships in childhood can carry substantial consequences. But increasingly, researchers have been trying to understand why. Can early adversity cause disease, and if so, how? Why do some children seem to escape unscathed while others struggle? And can answering those questions point the way to interventions?



Vincent J. Felitti

Based on a growing body of evidence, researchers now say that young children's exposure to severe adversity – like abuse, neglect or violence – represent not just tough circumstances but experiences with the potential to carry lasting mental and physical consequences, potentially influencing development of parts of the brain involved in learning and memory, and the way the body responds to stress.

It's not deterministic. Many people withstand serious adversity without significant consequences, and many who experience trauma recover. Scientists say there are genetic differences in how susceptible children are to the effects of their environments and other factors that contribute to resilience, including the presence of a supportive caregiver who can help buffer the effects of stress. And researchers say that while the brain is most malleable when children are young, it maintains its ability to change through life.

But Felitti and others say the findings point to an opportunity still not widely reflected in health care policy or medical practice. It's a view shared by some of those now leading social service and public health programs in Connecticut:

A key way to target adult diseases, reduce health care costs and address a host of problems throughout life is to start early, focusing not on symptoms of illness but childhood adversity and the factors that can protect against its effects. That includes identifying and treating trauma early, to stem deeper problems from developing.

“It’s a real epidemic,” said Alice Forrester, executive director of the Clifford Beers Clinic in New Haven. “Adversity, toxic stress, trauma, all of these are really high-cost, high-impact risk factors that drive every human service cost out of control.”



Alice Forrester

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After his early interviews with the weight-loss study dropouts, Felitti met with skepticism. An attendee at a 1990 conference told him the reports of abuse were excuses “for failed lives.” Then someone from the Centers for Disease Control suggested he see if the findings could be validated in a general population.

The result was the [Adverse Childhood Experiences Study](#), a survey of more than 17,000 Kaiser Permanente patients – a middle class, privately insured group.

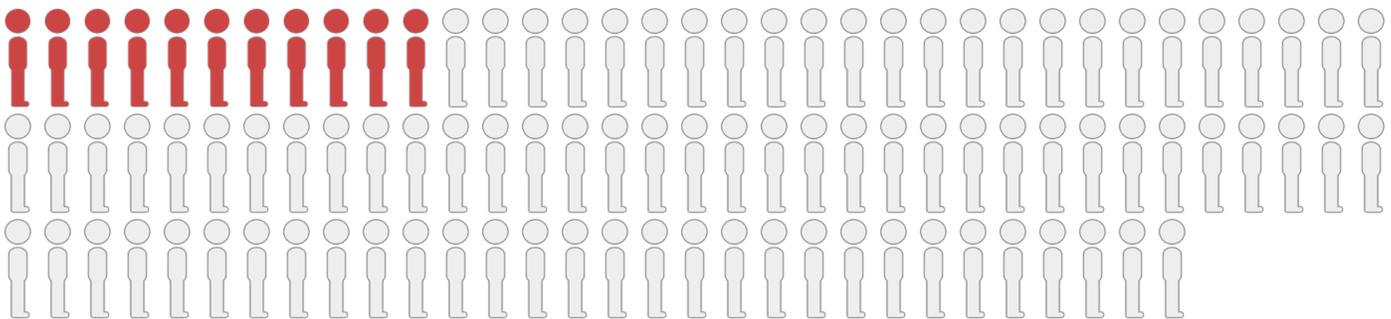
Participants answered [questions](#) about their health and whether they had experienced one of seven types of adversity in childhood: sexual, emotional and physical abuse; domestic violence; or living in a household with someone who abused drugs or alcohol, had mental illness or went to prison. (The researchers later added physical and emotional neglect, and having divorced or separated parents.) Each person was assigned an “ACE score,” based on the number of different categories they experienced.

# ACE Study: Childhood adversity is common

The ACE study used patients at Kaiser Permanente's clinics in San Diego, California. About 64 percent of people in the study reported that they experienced at least one of the adverse childhood experiences listed below.

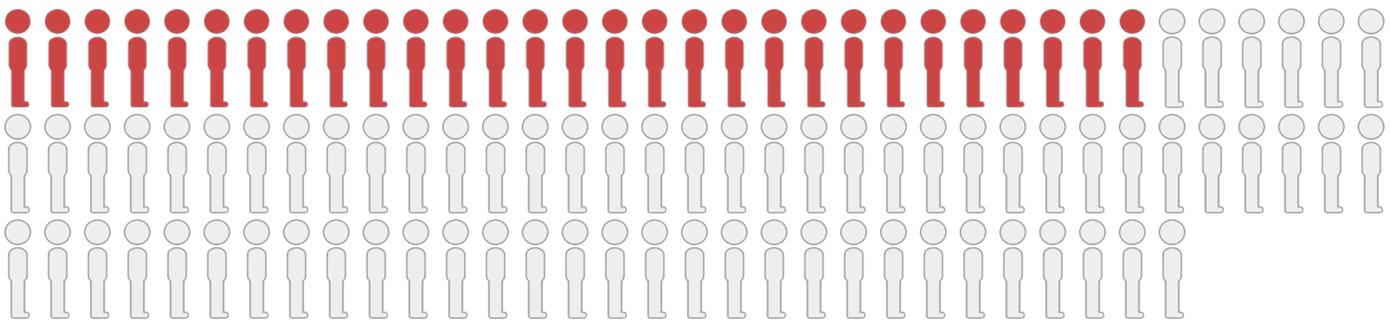
## Emotional Abuse (WHAT DOES THIS ENTAIL?)

10.6%



## Physical Abuse (WHAT DOES THIS ENTAIL?)

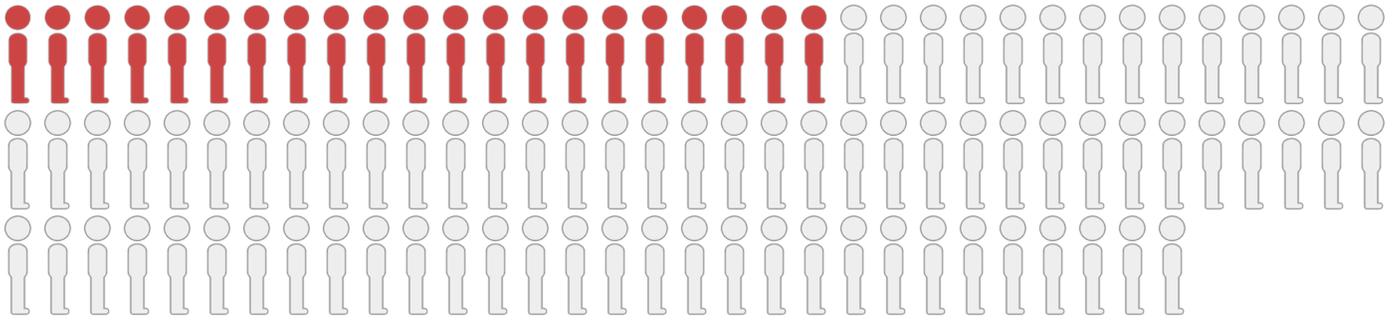
28.3%



## Sexual Abuse (WHAT DOES THIS ENTAIL?)

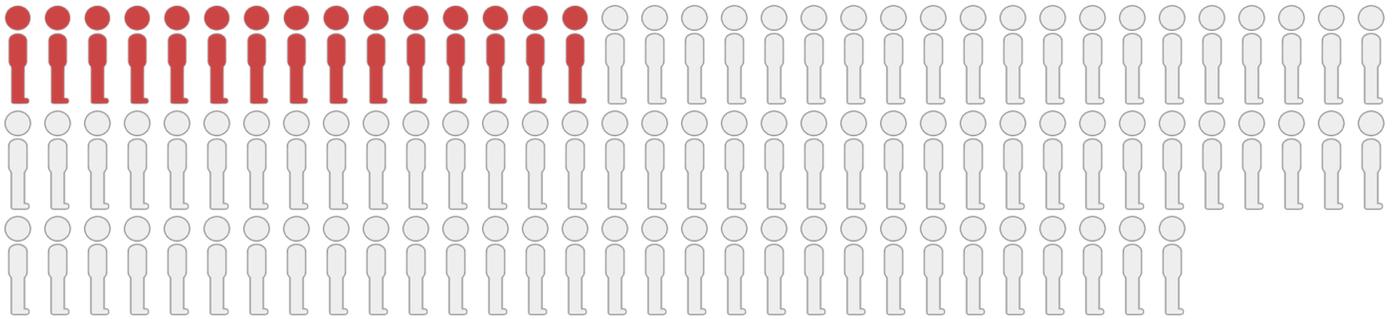
20.7%





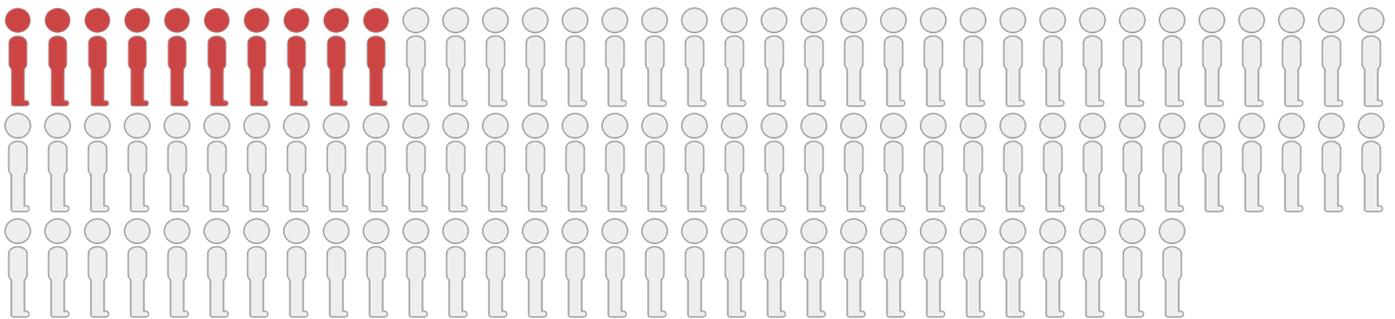
Emotional Neglect  
(WHAT DOES THIS ENTAIL?)

14.8%



Physical Neglect  
(WHAT DOES THIS ENTAIL?)

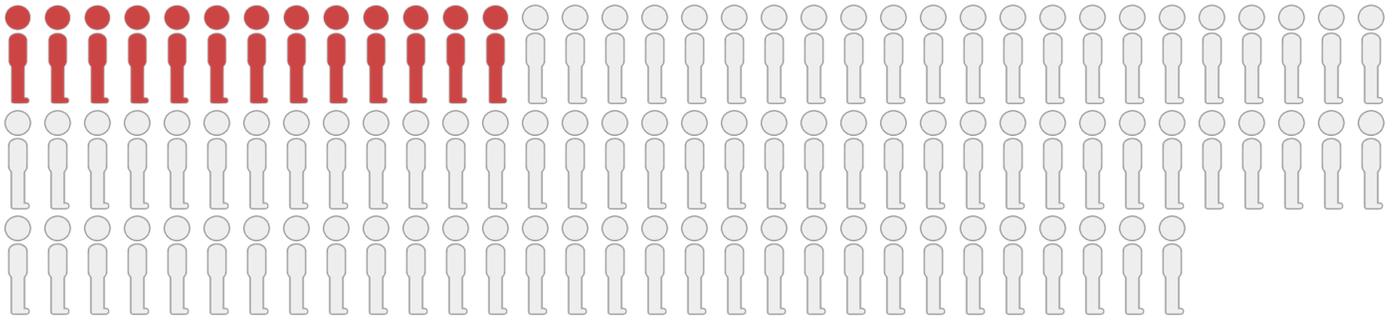
9.9%



Mother treated violently  
(WHAT DOES THIS ENTAIL?)

12.7%

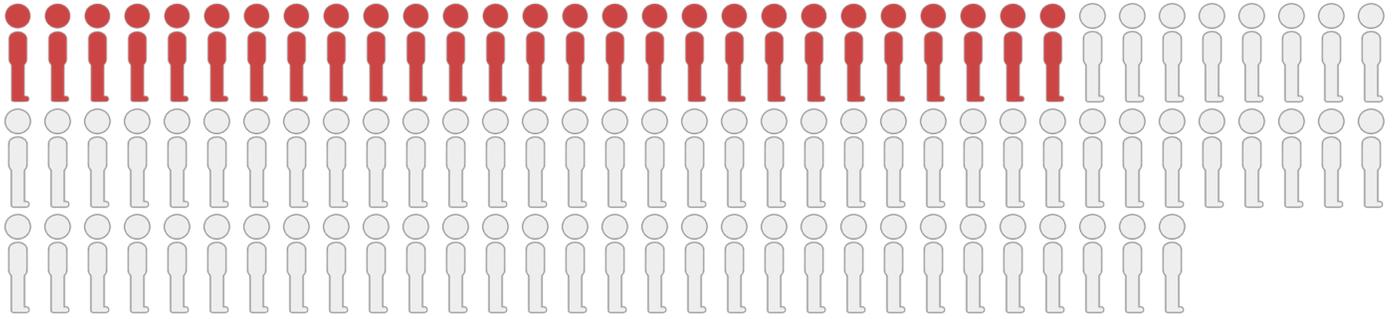




Household substance abuse

(WHAT DOES THIS ENTAIL?)

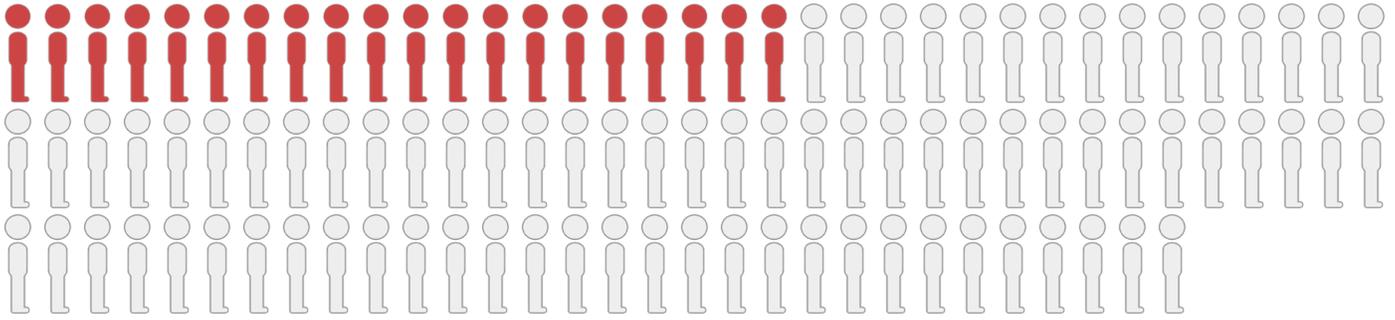
26.9%



Household mental illness

(WHAT DOES THIS ENTAIL?)

19.4%

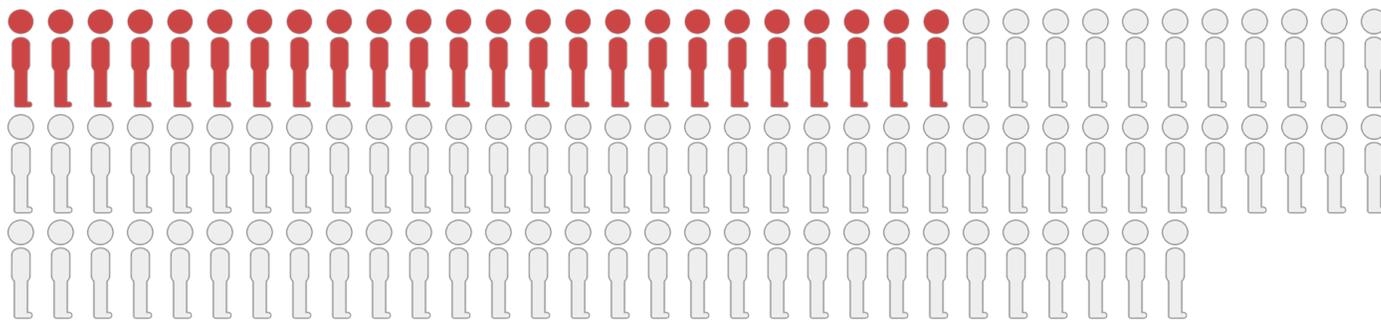


Parental separation or divorce

(WHAT DOES THIS ENTAIL?)

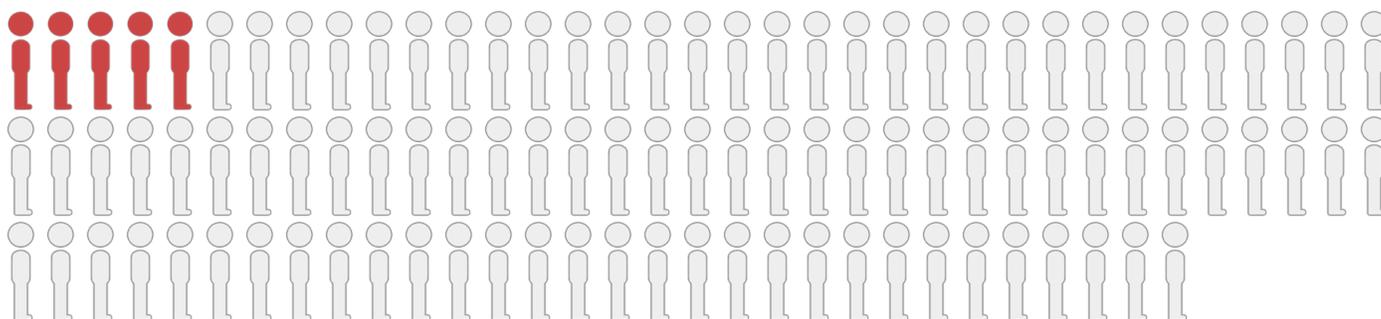
23.3%





Incarcerated household member  
 (WHAT DOES THIS ENTAIL?)

4.7%



ALVIN CHANG / CT MIRROR

Source: Centers for Disease Control and Prevention — ACE Study data and statistics

Just under two-thirds of the participants **reported** at least one type of adverse experience, and 12.5 percent reported experiencing four or more. One in five said they had been sexually abused. Twenty-eight percent reported being physically abused.



What is your ACE Score?

0/10 QUESTIONS

The original ACE Study used a four-page questionnaire to come up with an 'ACE Score.' One of the researchers, Vincent J. Felitti, provided us with the questions so you can find your ACE score.

Click 'Start' to begin.

Start

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And as a person's "ACE score" rose, so did the person's likelihood of abusing drugs or alcohol, being severely obese and having depression or a history of attempting suicide. So did the person's likelihood of having illnesses including cancer, chronic bronchitis, hepatitis and heart disease. The risks were particularly strong for those with four or more ACEs.

Some of the connection is the result of behaviors like smoking, alcoholism and drug use, all of which were more common among people with higher ACE scores. But even after controlling for those sorts of risk factors, researchers found that people with higher ACE scores had a higher likelihood of having conditions including **liver**, **heart** and **lung** disease.

There are limitations to this kind of research. Someone with serious medical or mental health problems might spend more time dwelling on potential early life causes and report them when surveyed.

But other **studies**, including research that followed children into adulthood, have **reported** similar findings.

One **found** that children with four or more ACEs were 17 times more likely to have learning or behavior problems than those with no ACEs, and nearly 50 percent more likely to be overweight or obese. Other **studies** have found problems linked to children's exposure to **neighborhood violence**.

"In the context of everyday medical practice, we came to recognize that the earliest years of infancy and childhood are not lost but, like a child's footprints in wet cement, are often life-long," wrote Felitti and Robert Anda, an epidemiologist and ACE Study co-author.



Felitti wasn't the first to examine links between stressful experiences and other problems. By the time Seth Pollak began his career more than two decades ago, research had linked child abuse to a host of bad outcomes.

But Pollak, a psychology professor at the University of Wisconsin, wondered why. How come the way you're treated at age 2 would influence the way you play with other children at age 5, your school performance at 10, your risk for substance abuse at 14, or the way you parent your own children? And why would it be related to developing diabetes and heart disease in your 60s?

"How's it getting under the skin? Why is it affecting so many different parts of an individual's life, and why is it cascading over such a long period of development?" Pollak wondered.

He started by looking into things others had taken for granted.

"People kept saying that abused kids tend to be very aggressive, they tend to be quick to anger, they tantrum a lot," he said. Were there corresponding differences in brain physiology?

He designed an experiment in which children looked at pictures of people expressing



Seth Pollak

emotions, while he recorded brain physiology to monitor their attention and memory systems.

It turned out the abused children had high levels of brain activation when they saw angry faces, but not other facial expressions.



Pollak conducted a study in which children looked at prototypes of four different expressions — happiness, fear, anger and sadness — across a morphing spectrum. (Courtesy of the National Academy of Sciences)

Subsequent studies found similar things: Preschoolers who had been abused by their parents were more attuned to anger when **overhearing strangers arguing**. Children who had been abused were more likely than non-abused peers to **interpret an ambiguous face as angry**. Children who were neglected had trouble distinguishing emotions.

To Pollak, the findings suggested that the children’s brains were adaptive. The children were being hurt by the people who were supposed to protect and nurture them. They had few defenses. But their brains could specialize in detecting a potential threat, learning the cues that signaled an adult’s mood had changed.

The problem is, those adaptations come at a cost.

If you see anger in an ambiguous face, what happens when a teacher approaches you with a neutral expression? Or if you’re on the playground and misread another kid?

“If you respond as if you’re about to be attacked, which makes sense to you, you are going to be labeled as an aggressive child,” Pollak said.

There’s another problem too: The more you see threats in your environment, the more your brain is likely to set in motion a physiological stress response.

And, researchers believe, stress is one of the key links between early adversity and disease.



The body has a complex set of systems for handling stressors. It’s what directs your focus to the oncoming car before a collision and mobilizes your energy to outrun an attacker. It inhibits your immune and growth functions – not needed to fend off the current danger – and raises your heart rate and blood pressure.

And, when the systems are functioning normally, they turn off when the threat is gone.

But if the stress-response systems are activated frequently, or for prolonged periods, it can take a toll on the body, producing what researchers call “wear and tear” – and vulnerability to disease.

Frequent or prolonged activation of the stress-response systems in young children, in the absence of a supportive adult who can help them cope, can have particularly **severe consequences**, researchers say. A group of researchers based at Harvard’s Center on the Developing Child dubbed this “toxic stress,” and warn

that it has the potential to **affect parts of the brain** involved in **learning, memory** and perceiving threats, and to set children's stress-response systems to become overly reactive or under-responsive to threats.

Research indicates that early experiences, starting prenatally, **calibrate the stress-response** system, said W. Thomas Boyce, a professor at the University of California, San Francisco School of Medicine, who co-authored one of the first journal articles on toxic stress.

“The newborn is unconsciously sampling the environment to determine, ‘Just what kind of a world have I been born into?’” Boyce said. “And what is going to maximize my survival and fitness in this world?”

When a child has too many experiences with danger or unpredictable threats, “It’s almost like their brain decides, ‘Well, this is a dangerous world, I’m going to stay on alert,’” said Patricia Wilcox, who leads the Traumatic Stress Institute at Klingberg Family Centers in New Britain. “And they get stuck in that danger activation mode.”

It’s hard to learn when you’re living in a heightened state of anxiety, focused on danger, she noted.

“When something actually happens in the present,” she said, “instead of just going from a base level to some more activation, they’re going from a high activation to a super-high activation, and they may seem to others to be over-reacting.”



How does stress lead to disease? Remember, the stress response affects immune functions, which are needed to fight disease. One of those functions is inflammation, which, in chronic form, has been linked to illnesses including heart disease and type 2 diabetes.



Resources: Find help

If you or someone you know needs help, there are resources that can help. We've compiled a list of services that can provide information and assistance on topics including finding mental health care, help coping with trauma and answers to questions on a child's behavior or development.

[See resources »](#)

[How to talk about trauma »](#)

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If a person's physiology has trouble regulating the stress response – something **found to occur** in some adults who were abused as children – could it also have trouble regulating inflammation?

One team of researchers found that, compared to people who hadn't been, adults who were maltreated as children were **60 percent** more likely to have elevated indicators of inflammation in their 30s, after controlling for other risk factors.

"Childhood maltreatment is a preventable and potentially treatable childhood risk factor for poor adult health," they wrote.

Other researchers have examined links between early adversity and **cancer**, theorizing that exposure to stress could weaken the immune system's ability to detect tumor cells. In one study, scientists found that **skin cancer developed faster in mice** that had been subjected to chronic stress – spending hours a day in restraints – than in mice who hadn't, in part because of a weaker immune response.

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## Childhood adversity correlates with health problems

The number of different types of adverse childhood experiences a person reported correlated to a greater likelihood of having many different mental and physical health problems. These charts show how the prevalence of problems rose by a person's ACE score among participants in the ACE Study. ACE scores are shown in the number beneath each bar.

Note: Prevalence is the percentage of people in this study who had a given health problem. This is adjusted for age.

Click on "Risk Ratio" to see how many time more likely a person in this study was to suffer from a health

problem, compared to someone with no ACEs. This is adjusted for age, gender, race and educational attainment.

PREVALENCE (%)	RISK RATIO	SAMPLE SIZE
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Ever had a skeletal fracture

Ever had hepatitis or jaundice

Fair or poor self-rated health

ALVIN CHANG / CT MIRROR

Source: *Relationship of Childhood Abuse and Household Dysfunction to Many of the Leading Causes of Death in Adults*

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There are also indications that early experiences can interact with a person's genetic code and influence whether certain genes get expressed or not.

There's **evidence**, for example, that a mother rat's licking and grooming of her baby in the first week of life helps produce a better-regulated stress-response system by influencing the expression of genes involved in the system. Studies have suggested a similar process could occur in humans, including **one examining the brains of suicide victims** that found differences in gene expression between those who had been abused as children and those who hadn't.

Researchers are also looking into genetic differences that could help explain why some children are more heavily influenced by their environment – whether good or bad. Scientists are examining whether, for example, having a particular variation of a gene could make a person more **susceptible to depression** after **experiencing maltreatment**.

But there's a long way to go in understanding the full picture, said Jay Belsky, a professor at the University of California, Davis.

"It's almost like we're getting ever more appreciative of how complex the puzzle is," Belsky said. "We're getting a sense of what part of the board certain puzzle pieces are going to go in" – but it's not yet clear how they fit together.

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# A breakdown of participants in ACE study

The ACE study used patients at Kaiser Permanente's clinics in San Diego, California, so this may not be a nationally representative sample. But general trends, like a higher rate of ACEs for minorities, holds true over studies of other populations. The ACE Study included two groups of patients. This data represent patients in the first group only.

ALL	RACE	GENDER	EDUCATION	AGE
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ALVIN CHANG / CT MIRROR

Source: [Relationship of Childhood Abuse and Household Dysfunction to Many of the Leading Causes of Death in Adults](#)



The ACE Study isn't new. Its first findings were published in 1998.

“If that study was about broccoli, it would be all over the front page of The New York Times,” Wilcox said. “The trouble is it’s just such a huge thing to change.”

“We have this incredible proof about the expense that trauma is causing our society and how all of these physical ailments are related,” she said. “And yet, what do you do to change it? It’s not like, ‘Well, eat more broccoli.’”

After the study, Felitti’s department at Kaiser Permanente added questions about adverse experiences to the questionnaire patients fill out before their physical exams. When doctors see the results, they can ask, “Can you tell me how that’s affected you later in life?”

Felitti said it’s paid off. A study found patients who were asked the trauma-oriented questions had 35 percent fewer doctor office visits and 11 percent fewer emergency room visits the following year.



**#talktrauma**

Continue the conversation on Twitter and Facebook using the hashtag [#talktrauma](#).

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He thinks it’s because asking the questions serves a purpose akin to confession in the Catholic Church: a person tells something shameful about himself to a person of authority, “and in the course of a couple of minutes, comes away understanding that they still are an acceptable human being.”

“The impact of that is extraordinary,” Felitti said. “And yet, it’s gone nowhere.”

Even the other departments at Kaiser Permanente, where the ACE Study was conducted, haven't started asking patients about adverse experiences, Felitti said.

So he's concluded that the best approach lies outside the doctor's office, in something he imagines could be modeled in the plotline of a television show.

"If you were to ask me what my thoughts are on the most effective public health advance that I can think of in current times, I would say to figure out how to improve parenting skills across the nation," he said. "There is that huge portion of the population that has had no experience with supportive parenting themselves, many of whom might do better if they only knew what it looked like." ♦

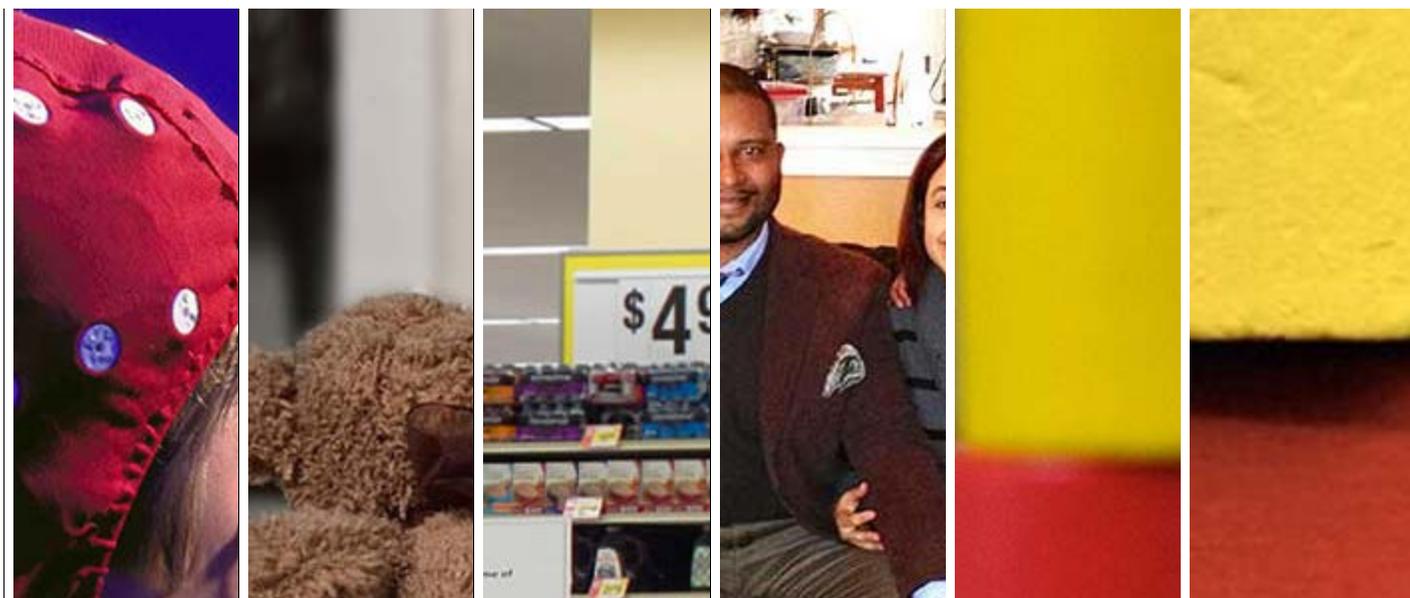
*Part two: Intervention. A Connecticut program for young children who have experienced trauma or other significant challenges has gotten results by focusing on their relationships with a parent or caregiver - something that science shows can help protect a child's brain and body from the effects of adversity.*

*Arielle Levin Becker wrote this story while participating in the National Health Journalism Fellowship, a program of USC's Annenberg School for Communication and Journalism.*



#### STARTING EARLY: A FOUR-PART SERIES

Tuesday	Wednesday	Thursday	Friday	Talk	Help



## Start the conversation

23 comments ▼

[Add a comment](#)



**Derek Owen** · ★ Top Commenter

its nice to read this, but its unfortunate such progressive thought and action just doesnt exist where I live. What happened to me as a kid harmed me in so many ways, yet the vast majority of medical and health professionals and people in the field, due to their own issues or lack of education or lack of compassion, instead chose to blame or shame me for struggling to cope, if they didnt just dismiss or marginalize me outright as a failure in some way. People that read this need to know that an overwhelmingly high percentage of professionals working currently with people with these issues are not capable or skilled enough to recognize, understand, or develop an appropriate treatment framework to help people who were harmed by childhood trauma and often do more harm to people like me due to their own ignorance, lack of understanding, and lack of empathy.

Its good people are starting to "get it", but the field has an enormously long way to go towards validating the experiences of people such as myself.

Reply ·  7 · January 28 at 11:35am



**Jas Fu**

Hi Derek, i completely get where you are coming from. I went through numerous professionals before finding a fantastic down the earth counsellor, then when i needed to go deeper, she provided the space for me to ask and supported me in doing so and found 2 referrals that she thought might fit me. . I have now a psychotherapist who has 18 + years in the field and even she is angry that not many professionals know how to deal with this. My point is, keep trying, you'll find someone to help you soon, who gets it and gets you. Unfortunately they need to give space so that you can trust them. And that has taken me a while because of all the quacks and cranks i've met along the way. You can't heal on your own, its very hard to do, this is a harsh reality.

Ring around, ask who has at least 10 years experience in whatever your ... [See More](#)

Reply ·  4 · January 31 at 3:58am



**Sherrie Patrick** · Frisco, Texas

This explains a lot. I live in fear every day, even when there is nothing to fear. When you grow up im a house where a mother is being beaten the anxiety stays with you for life. I was 50 yrs old before I realized that most people don't live in fear every day the way I do. Thanks for the article.

Reply ·  4 · January 28 at 2:27pm

**Francine LoStocco** ·  Top



Commenter

Gee they left off medical abuse. Parental separation was a biggie. But yet CCMC did just that to Cassandra C, as well as medical kidnapping, medically assault, and forcing chemo to save her. Hmmm I wonder what the heck kind of mental issues she will have after that tramatic experience.

Reply · April 29 at 12:00pm



**Rodger Niemeier** · Director of Ministries at Eagle Wings Ministries

Having worked among those struggling with chemical dependency over the last 40+ years, a realization increasingly became evident that underlying, first-cause issues needed to be addressed and resolved in order to overcome such an addiction; this article confirms that. A high percentage of those I've listened to over the last 13 years in an inpatient addictions treatment center, shared stories of childhood/teens abuse (whether sexual, physical, verbal, emotional and/or neglect). Gabor Mate (In the Realm of Hungry Ghosts), among others, increasingly affirm this. I've come to believe that the more symptomatic surface issues (presenting problems: substance abuse or other addictions/obsessions; depression-anxiety problems; etc.) are the proverbial tip of the iceberg, and are but the manifestation of deeper issues somehow involving...

[See More](#)

Reply · 2 · January 30 at 5:13pm



**Jody Johnston Pawel** · Top Commenter · Founding Certified

