CENTER FOR
YOUTH
WELLNESS
health begins with hope

DATA REPORT

A HIDDEN CRISIS

Findings on Adverse Childhood Experiences in California

The Center for Youth Wellness (CYW) is a health organization embedded with a primary care pediatric home serving children and families in the Bayview Hunters Point neighborhood in San Francisco. We were created to respond to a new medical understanding of how early adversity harms the developing brains and bodies of children. We prevent toxic stress by raising national awareness among those who have the power to make a difference – from parents to pediatricians to policymakers. We screen every young person we see for **Adverse Childhood Experiences (ACEs)**, which we know can lead to toxic stress and poor health outcomes in life. We heal children's brain and bodies by piloting the best treatment for toxic stress and sharing our findings nationally.

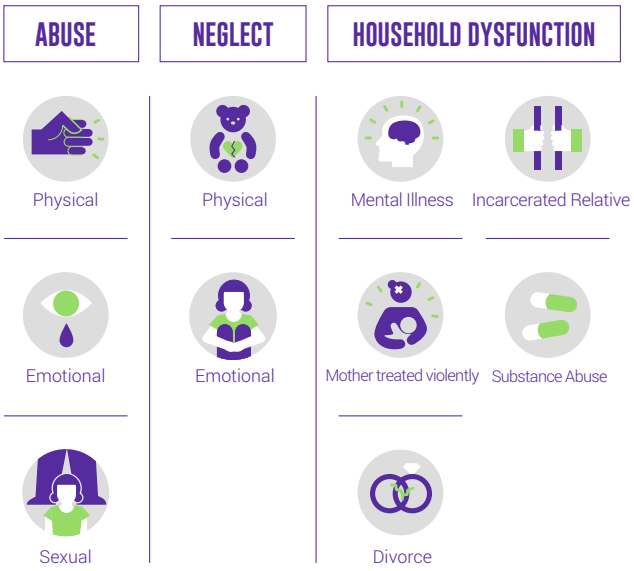
For more information, please visit our website at **www.centerforyouthwellness.org**.

EXECUTIVE SUMMARY

Adverse Childhood Experiences, or ACEs, are a hidden crisis, impacting the health and wellbeing of children, families and communities across California. Occurring during childhood, the most formative period in a person's life, ACEs are traumatic experiences that have a profound impact on a child's developing brain and body with lasting impacts on a person's health and livelihood throughout her lifetime. There are ten recognized ACEs which fall into three general types: (1) abuse; (2) neglect; and (3) household dysfunction. High numbers of ACEs have long been associated with increased risk for serious health conditions, such as heart disease, diabetes, and cancer.

A Hidden Crisis is a first look at the impact of ACEs in California through four years of data collected by the annual California Behavioral Risk Factor Surveillance System. The findings clearly illustrate that ACEs are a public health crisis with far-reaching consequences on the health and wellbeing of Californians.

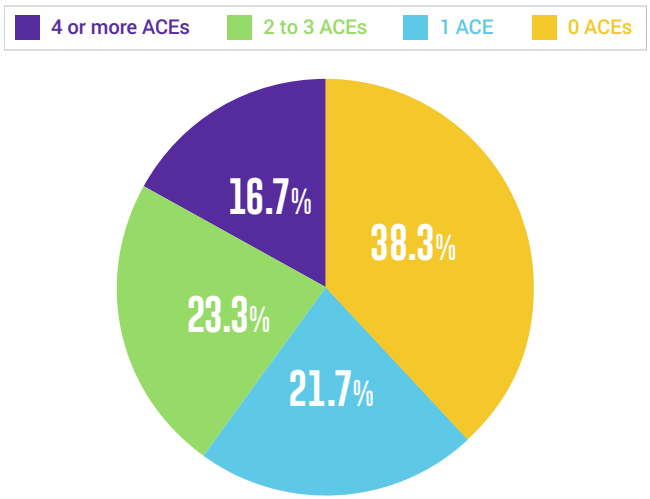
The three types of ACEs include



Types of Adverse Childhood Experiences
Image courtesy of the Robert Wood Johnson Foundation

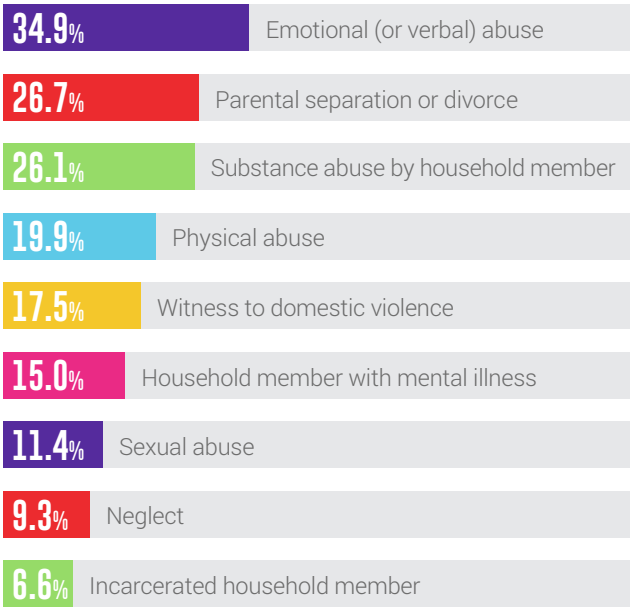
KEY FINDINGS

In California, **61.7%** of adults have experienced at least one ACE and **one in six**, or 16.7%, have experienced four or more ACEs. The most common ACE among California adults is emotional (or verbal) abuse.

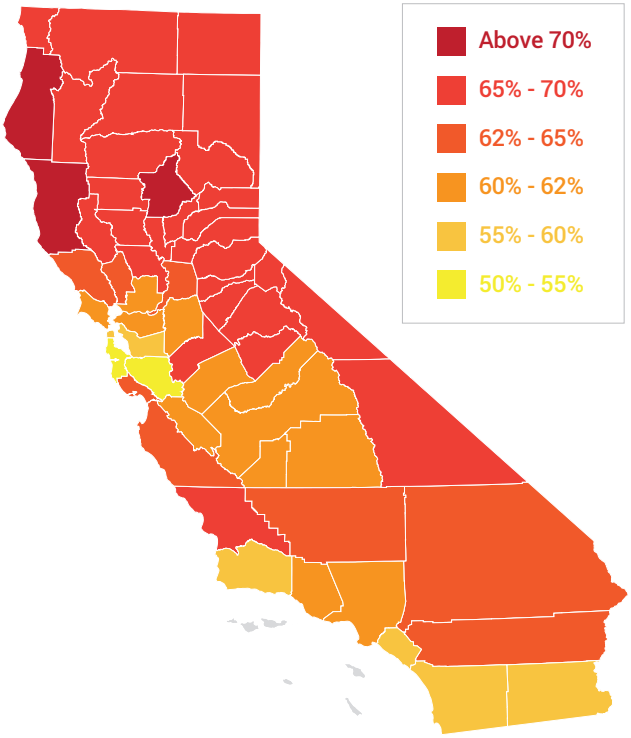


Prevalence of number of ACEs among California adults

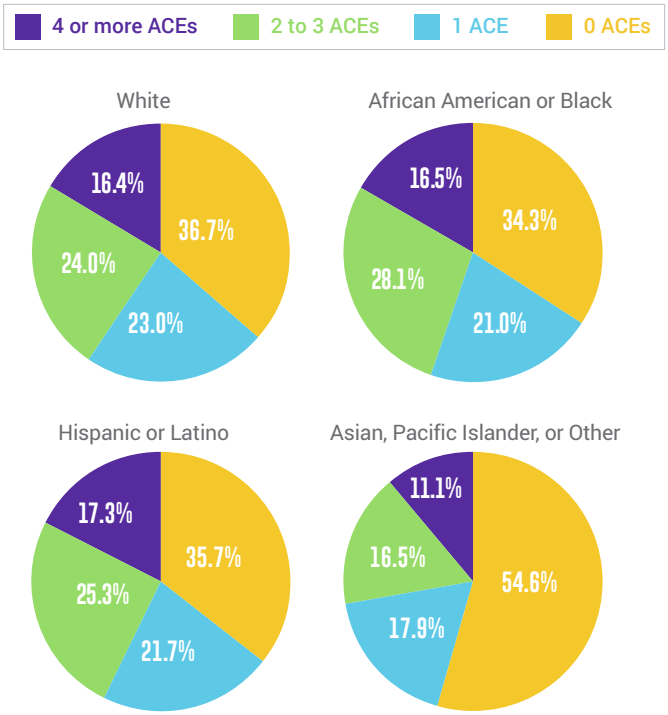
Most common ACEs among California Adults



Most common ACEs among California adults



Percent of residents with at least one ACE across California counties



Prevalence of ACEs within racial/ethnic Groups in California

ACEs also affect every community in California. In some counties, **over 75%** of residents have at least one ACE. Even in counties with the lowest prevalence of ACEs, **1 out of every 2** residents, or 50%, has one or more adverse experiences in childhood.

Individuals are similarly impacted by ACEs regardless of race and ethnicity. As the graphs above illustrate, the prevalence of ACEs is relatively consistent across race and ethnic groups in California.

In California, as in previous studies, there is a strong correlation between ACEs and serious health conditions. Compared to an individual with no ACEs, an individual with four or more ACEs is more likely to experience chronic disease and engage in negative health behavior.

A PERSON WITH 4 OR MORE ACES IS:

- 5.13 times as likely to suffer from depression
- 2.42 times as likely to have chronic obstructive pulmonary disease (COPD)
- 2.93 times as likely to smoke
- 3.23 times as likely to binge drink

RECOMMENDATIONS

While the data appears to paint a grim picture of the health and wellbeing of Californians exposed to ACEs, there is much that can be done to support the health and wellness of children and families across the state. These findings should serve as a call to action across California. The following recommendations illustrate crucial first steps in addressing ACEs in California:

- Collect annual state-level data on the prevalence of ACEs
- Increase awareness about ACEs and their impact on health and wellness
- Increase access to health care, including mental health services, for all Californians
- Support efforts to identify evidence-based practices to identify and respond to ACEs
- Advance efforts to integrate behavioral and physical health care practices

INTRODUCTION

There is a hidden danger lurking in communities across California. Adverse Childhood Experiences, or ACEs, affect people from all backgrounds, regardless of race, income, education, or geography. Occurring in childhood, exposure to chronic adversity during the most formative years of a person's development has the potential to reap a lifetime of challenges, including poor health and even early death. Groundbreaking research is underway to explore the neurobiological and physiological impact of exposure to adverse experiences in childhood. However, as science works tirelessly to understand fully the impact of ACEs on children's brains and bodies, we must recognize the current and ongoing effects that ACEs have on individuals, families, and communities across the state.

This report represents the first of its kind in California – an effort to illustrate the long-term and far-reaching consequences of ACEs on California adults. Based on four years of data from the California Behavioral Risk Factor Surveillance System, this report endeavors to bring to light the hidden health risks of ACEs.

While the findings in this report may appear bleak, health and healing begins with hope. By recognizing ACEs as a public health crisis in California with impacts across numerous sectors, including education, child welfare, and the economy, we have the opportunity to take a stand against ACEs and create a California in which every child has the opportunity to thrive.

WHAT ARE ACES?

ACEs, or Adverse Childhood Experiences, are traumatic experiences that can have a profound impact on a child's developing brain and body with lasting impacts on a person's health and livelihood throughout her lifetime. There are ten recognized ACEs, which fall into three types – abuse, neglect, and household dysfunction. New research is underway to establish other traumatic events, such as exposure to community violence, bullying, homelessness, discrimination, and involvement in the foster care system, as ACE indicators.

The term, "ACE", was coined in 1998 following the publication of the groundbreaking Adverse Childhood Experiences Study (ACE Study). Led by researchers Dr. Vincent Felitti and Dr. Robert Anda, the ACE Study surveyed over 17,000 California adults, who were patients of Kaiser Permanente in San Diego, about their medical history and traumatic experiences in childhood.[1] Within the study population, the vast majority of the participants were white (74.8%) and had attained a college-level education or higher (75.2%).[2]

The three types of ACEs include

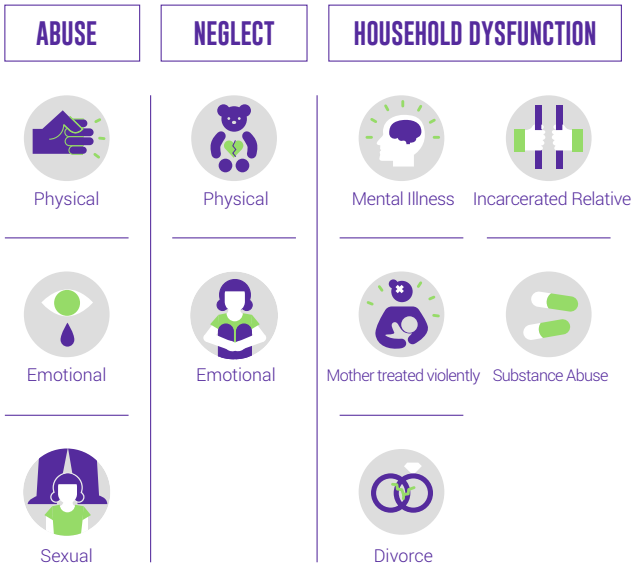


FIGURE 1: Types of Adverse Childhood Experiences
Image courtesy of the Robert Wood Johnson Foundation

The study revealed that ACEs were common among study participants – almost two-thirds (63.9%) of participants reported having at least one adverse childhood experience.[3] One in eight participants (12.5%) reported having four or more ACEs.[4] Moreover, researchers found that high ACE scores significantly increased the risk for poor health outcomes and negative health behaviors among study participants.[5]

Additionally, there was a strong dose-response relationship between ACEs and poor outcomes. As the number of ACEs increased, the risk of negative health outcomes increased as well. In fact, subsequent studies have found that the life expectancy of a person with six or more ACEs is 20 years shorter than a person with no ACEs.[6] The ACE Study's findings were unprecedented and would spark a new way of understanding the connection between childhood and adult health.

ACEs lead to increased risk for negative health behaviors.

A PERSON WITH 4 OR MORE ACES IS:

- 12.2 times as likely to attempt suicide
- 10.3 times as likely to use injection drugs
- 7.4 times as likely to be an alcoholic

ACEs lead to increased risk for serious health conditions.

A PERSON WITH 4 OR MORE ACES IS:

- 2.2 times as likely to have ischemic heart disease
- 2.4 times as likely to have a stroke
- 1.9 times as likely to have cancer
- 1.6 times as likely to have diabetes

THE EMERGING SCIENCE OF TOXIC STRESS

The ACE Study raised significant questions about the impact of early life experiences on lifelong health. Scientific breakthroughs, in the fifteen years since the ACE Study was first published, have revolutionized our understanding of the effects of stress caused by traumatic events on the developing brain and body of a child. This stress, or "toxic stress," is caused by strong, frequent, or prolonged adversity, such as ACEs, and is the "extreme, frequent, or extended activation of the body's stress response without the buffering presence of a supportive adult."[7]

Toxic stress is particularly harmful for children, whose brains and bodies are just developing. Left unaddressed, toxic stress can cause fundamental changes to a child's basic brain architecture as well as her developing immune and hormonal systems.[8] These changes can dramatically alter her ability to learn and interact with others and can fundamentally affect her physical and mental health.[9]

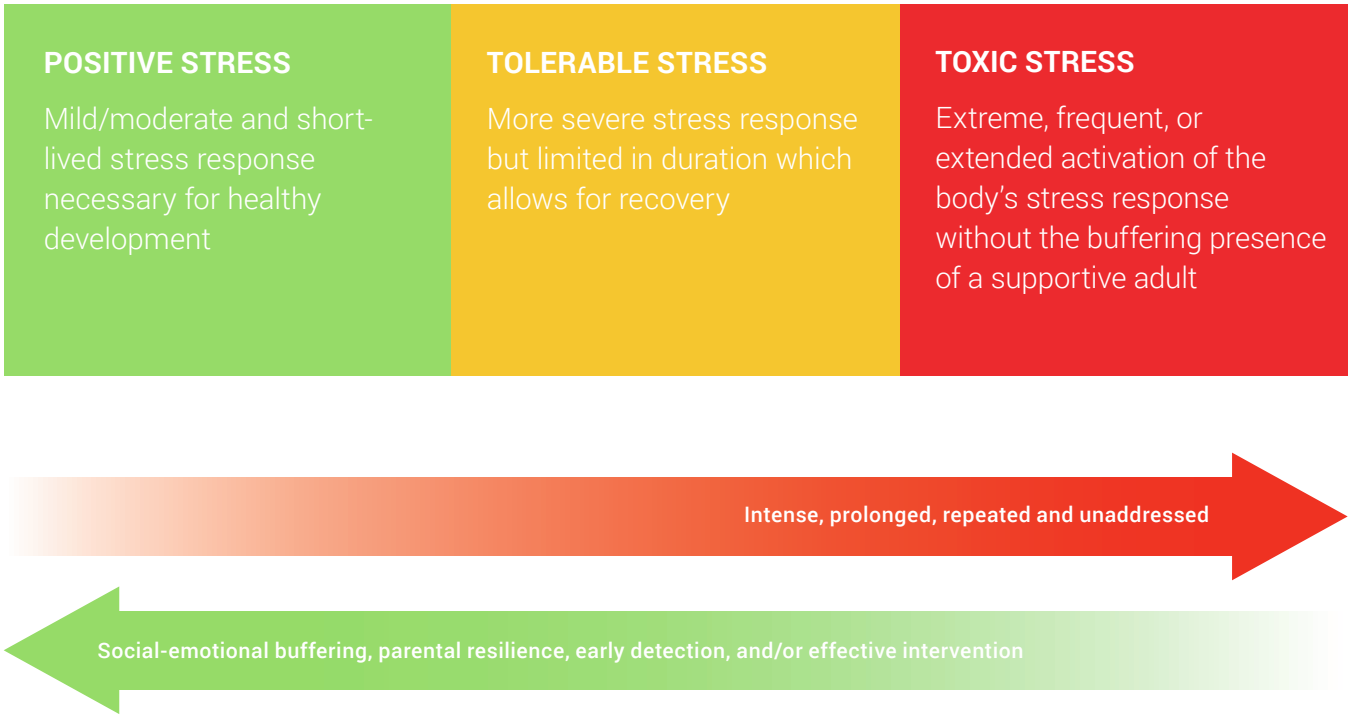


Figure 2: Spectrum of stress

ASSESSING THE HEALTH OF CALIFORNIA

The California Behavioral Risk Factor Surveillance System (BRFSS) is a random-digit dialing telephone survey of households with landlines and cellular telephones conducted each year by the California Department of Public Health. Led by the U.S. Centers for Disease Control and Prevention (CDC), the BRFSS gathers comprehensive information on the health and health-related behaviors of California adults ages 18 and over.

In 2008, the ACE module was introduced to the California BRFSS and was subsequently included in the 2009, 2011, and 2013 California BRFSS surveys. The ACE module was developed by the CDC in collaboration with Dr. Felitti and included eleven questions relating to eight types of ACEs – physical, emotional, and sexual abuse; parental incarceration; substance abuse by a household member; mental illness in a household member; domestic violence; and parental separation or divorce. An additional question related to neglect was created by researchers at the Public Health Institute and included in the 2008, 2009, and 2013 ACE modules.

The findings presented in this report reflect a cumulative analysis of all four years of ACEs data from the California BRFSS (sample size = 27,745). The findings have been weighted to be representative of the California population in 2010. All of the findings included in this report are derived from stable and reliable prevalence estimates. For more information on the methodology of this analysis, please see Appendix A.

ACES ACROSS CALIFORNIA

ACEs are an unfortunate reality for the majority of Californians - **61.7%** of adults have experienced at least one ACE, and **one in six**, or **16.7%**, California adults have experienced four or more ACEs. The number of Californians who have experienced four or more ACEs is considerably higher than the finding from the original Kaiser study in which 12.5%, or one in eight, of the study participants experienced four or more ACEs.

The most common ACE experienced by California adults is "emotional (or verbal) abuse" with almost 35% of adults indicating that a parent or adult swore, insulted, or put them down during their childhood. The next most prevalent ACEs are "parental separation or divorce", reported by 26.7% of adults, and "substance abuse by a household member", reported by 26.1% of adults.

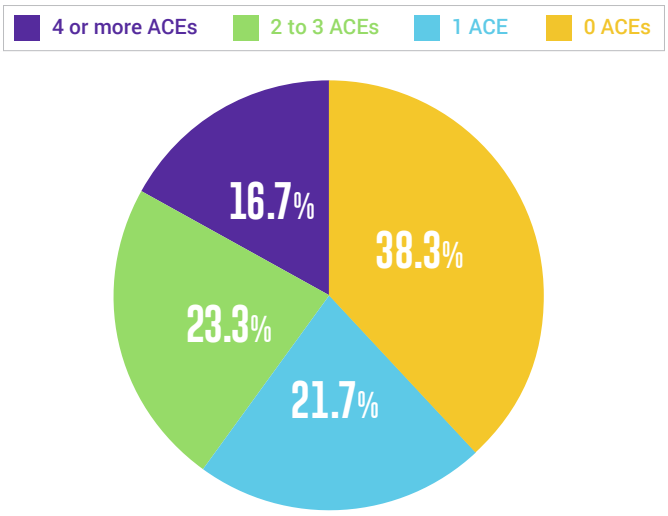


Figure 3: Prevalence of number of ACEs among California adults

Most Common ACEs Among California Adults

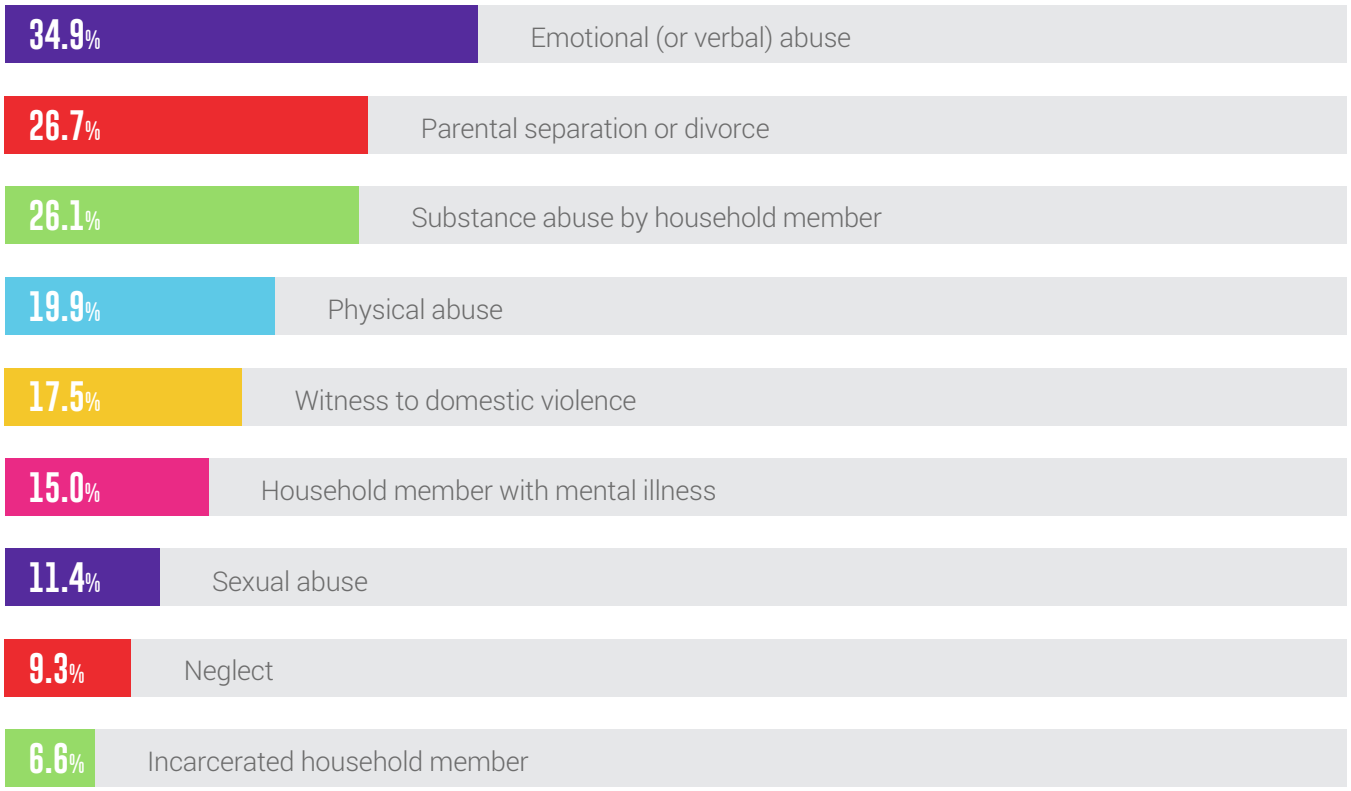


Figure 4: Most common ACEs among California adults

THE FACE OF ACES IN CALIFORNIA

ACEs impact Californians from all walks of life regardless of geography, race, income, or education. Although the prevalence of ACEs is generally consistent across race and ethnicity, high numbers of ACEs correlate with a person's poverty, education, and employment.[10]

A PERSON WITH 4 OR MORE ACES IS:

- 21% more likely to be below 250 percent of the Federal Poverty Level (FPL)
- 27% more likely to have less than a college degree
- 39% more likely to be unemployed

A NOTE ABOUT THE "NEGLECT" QUESTION:

To maintain consistency with CDC guidelines on data analysis of the BRFSS ACE module, the neglect question created by Public Health Institute researchers and included in the 2008, 2009 and 2013 ACEs modules has been omitted from the ACE score calculations, which were used to determine the following prevalence and prevalence ratios.

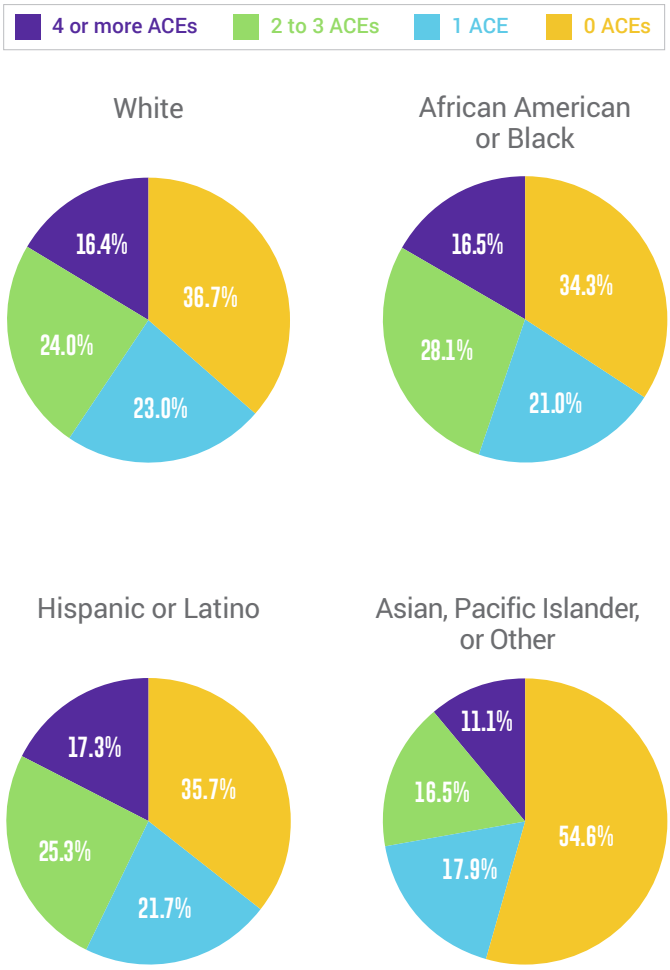


Figure 5: Prevalence of ACEs within racial/ethnic groups in California

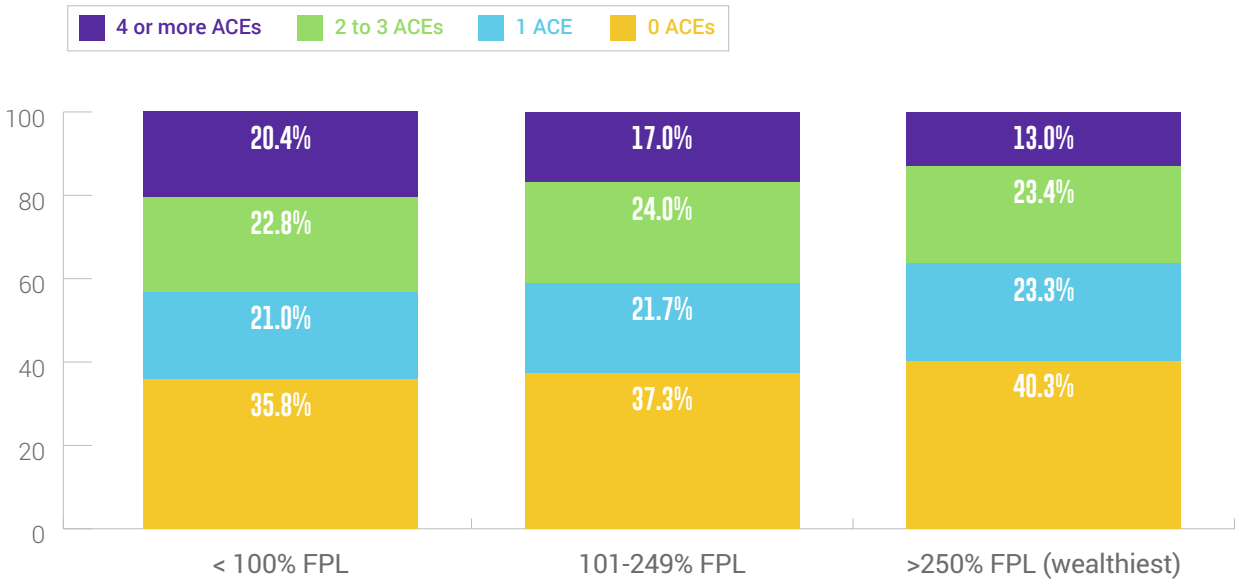


Figure 6: Distribution of ACEs within income levels

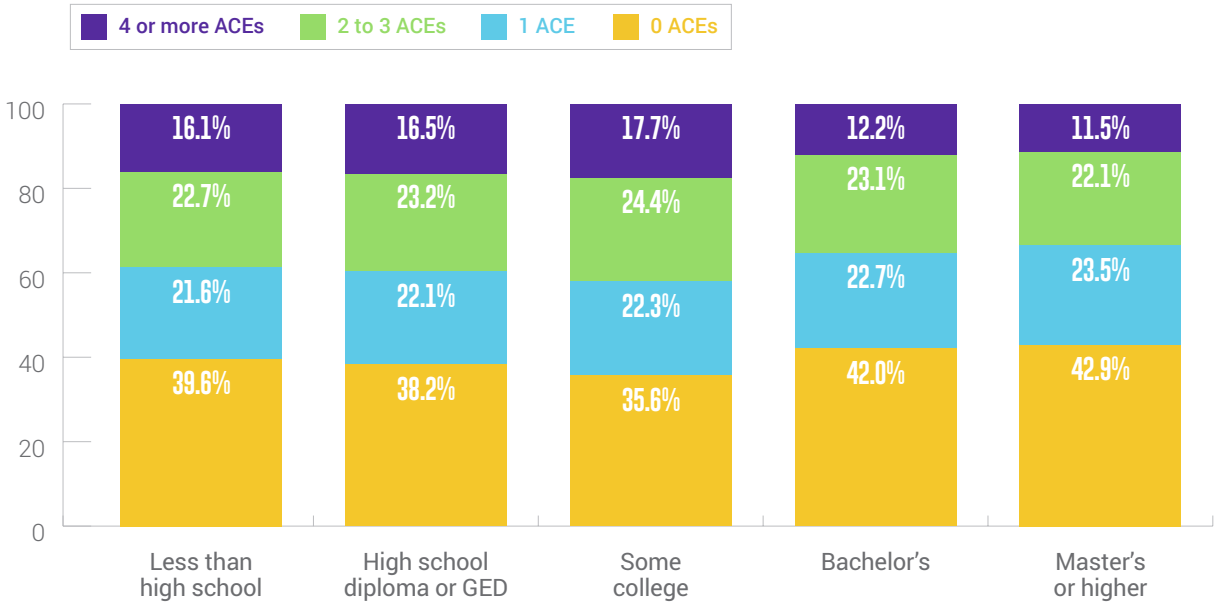


Figure 7: Distribution of ACEs within education levels

Figure 6 illustrates a correlation between ACEs and poverty. As income decreases, the percentage of individuals with four or more ACEs increases. Figure 7 shows a similar correlation with education level. The percentage of individuals who have received a bachelor's degree or higher and who have four or more ACEs is noticeably less than the percentage of individuals who have completed "some college" or have received a high school diploma and who also have four or more ACEs.

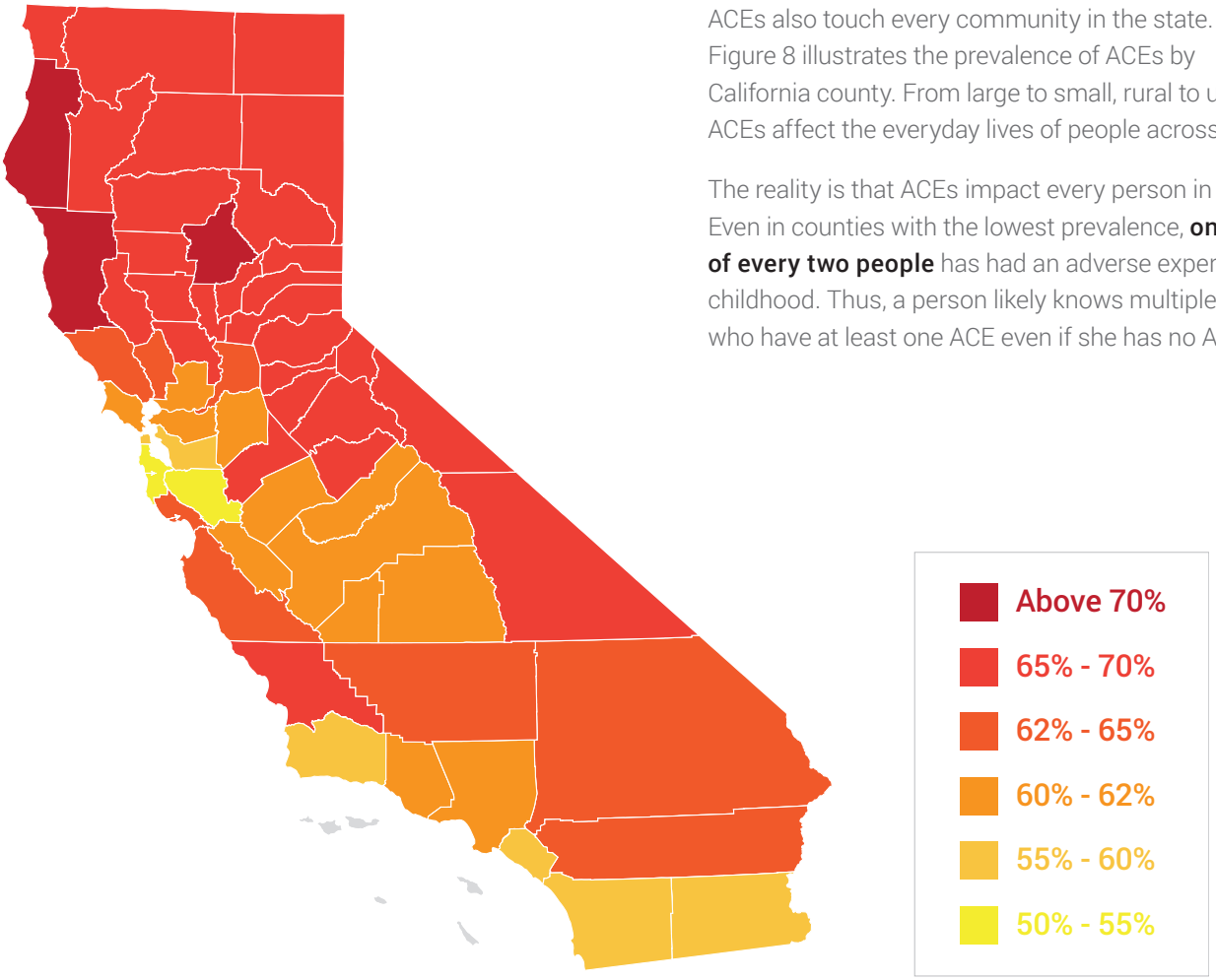


Figure 8: Percent of residents with at least one ACE across California counties

ACEs also touch every community in the state. Figure 8 illustrates the prevalence of ACEs by California county. From large to small, rural to urban, ACEs affect the everyday lives of people across California.

The reality is that ACEs impact every person in California. Even in counties with the lowest prevalence, **one out of every two people** has had an adverse experience in childhood. Thus, a person likely knows multiple people who have at least one ACE even if she has no ACEs

PREVALENCE OF ACES IN CALIFORNIA'S MOST POPULOUS COUNTIES

- Los Angeles County – 60.7% of residents have 1 or more ACEs
- San Diego County – 59.0% of residents have 1 or more ACEs
- Orange County – 59.3% of residents have 1 or more ACEs
- Riverside County – 64.5% of residents have 1 or more ACEs
- San Bernardino County – 62.5% of residents have 1 or more ACEs

CALIFORNIA COUNTIES WITH THE HIGHEST NUMBER OF ACES

- Butte County – 76.5% of residents have 1 or more ACEs
- Mendocino & Humboldt Counties (combined) – 75.1% of residents have 1 or more ACEs

CALIFORNIA COUNTIES WITH THE LOWEST NUMBER OF ACES

- Santa Clara County – 53.4% of residents have 1 or more ACEs
- San Mateo County – 53.9% of residents have 1 or more ACEs

ACES AND CALIFORNIA'S HEALTH

PHYSICAL HEALTH

BRENDA'S STORY

Brenda is a 50-year old woman living in Southern California. Although she now lives in a solidly middle-class suburb of Orange County, Brenda grew up in a low-income area of Los Angeles where gangs and drugs were a part of daily life. Brenda's father went to prison when she was five years old for selling drugs. Her mother, addicted to prescription painkillers, struggled to support the family and Brenda often went without enough food or clothing. Brenda's aunt stepped in to care for Brenda when she was ten years old but often suffered from severe bouts of depression. Not having health insurance, her aunt's illness went untreated for years. After she graduated high school, Brenda worked to put herself through college. Although she now lives comfortably, she has recently developed serious health problems and often struggles to complete simple tasks, experiencing muscle and chest aches daily.

Brenda has 4 ACEs

- Parental incarceration
- Substance abuse by household member
- Physical neglect
- Mental illness in household member

Numerous studies have found strong correlations between high numbers of adverse experiences in childhood and poor health outcomes in adulthood. As illustrated in Figure 9, the strong association between high numbers of ACEs and poor health outcomes among Californians has serious implications for the state's public health and healthcare systems.

ADULTS IN CALIFORNIA WITH 4 OR MORE ACES ARE:

- 2.42 times as likely to have chronic obstructive pulmonary disease (COPD)
- 1.86 times as likely to have asthma
- 1.69 times as likely to have kidney disease
- 1.55 times as likely to have a stroke

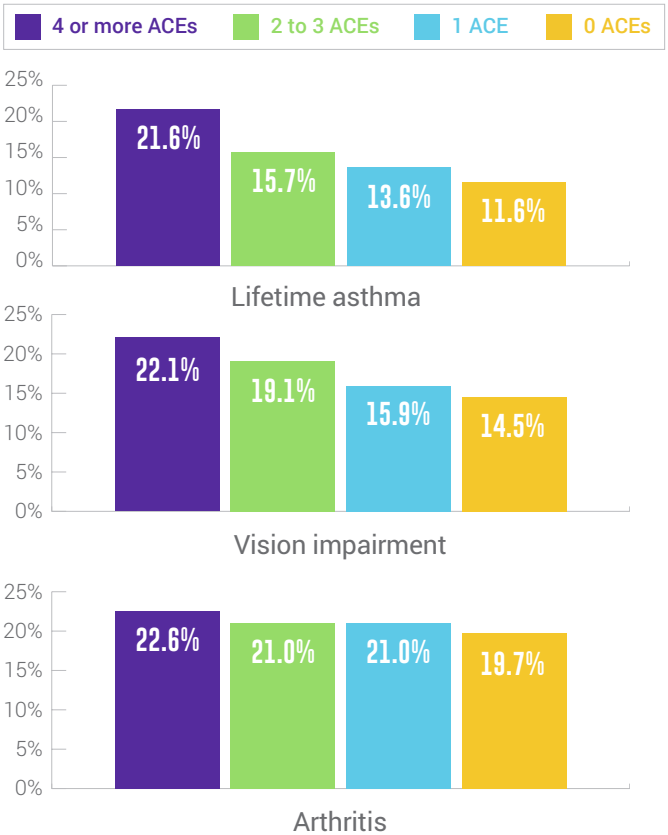


Figure 9: Relationship between ACEs and physical health

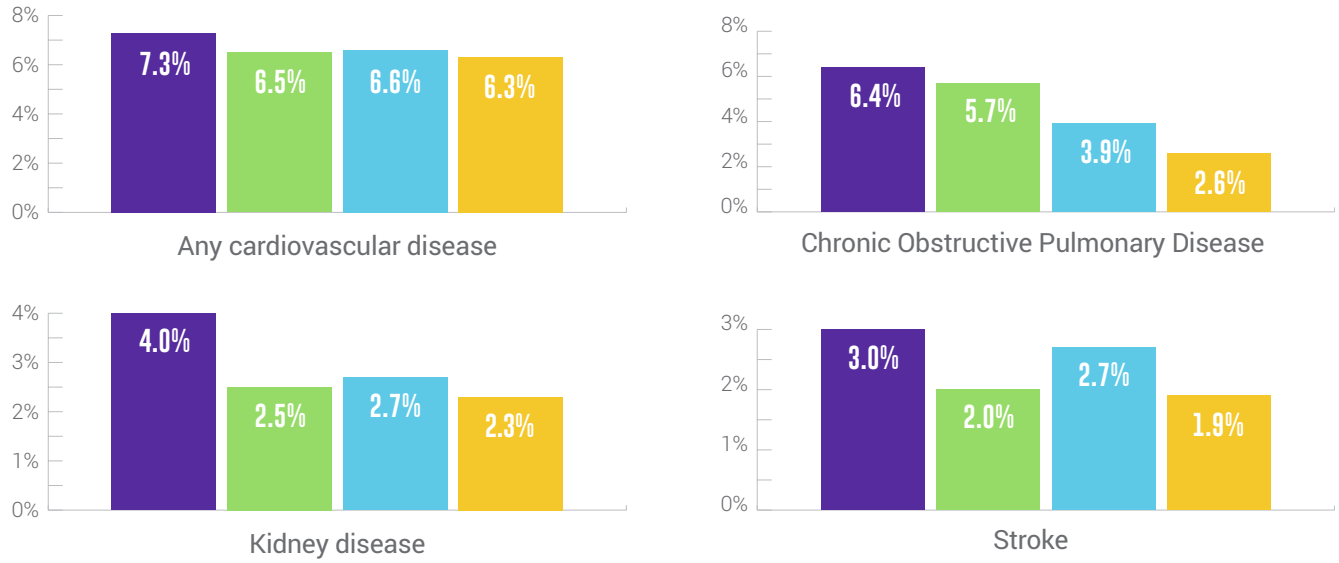


Figure 9: Relationship between ACEs and physical health (continued)

MENTAL HEALTH

ACEs have long been associated with mental health challenges in adulthood. Similarly, in California, a person who has experienced four or more ACEs is **5.13 times** as likely to suffer from depression than a person who has no ACEs.

Moreover, an adult who has four or more ACEs is **4.65 times** as likely to seek help from a mental health professional and **4.22 times** as likely to be diagnosed with Alzheimer's or dementia as compared with an adult who has no ACEs.

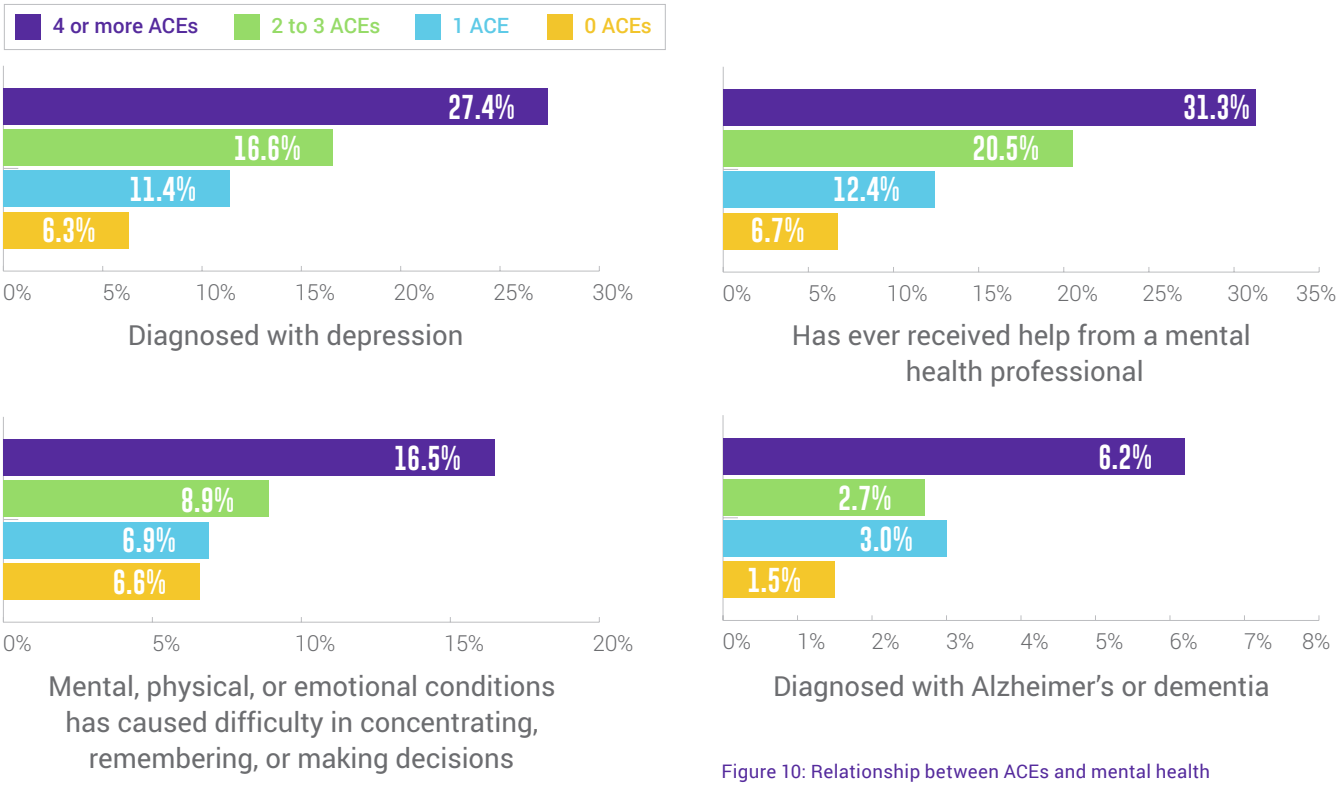


Figure 10: Relationship between ACEs and mental health

SELF–RATED HEALTH

In addition to increased risk for poor health outcomes, Californians with high numbers of ACEs also report feeling less healthy. Adults with four or more ACEs were **1.36 times** as likely to rate their health as "fair" or "poor" compared with adults with no ACEs.

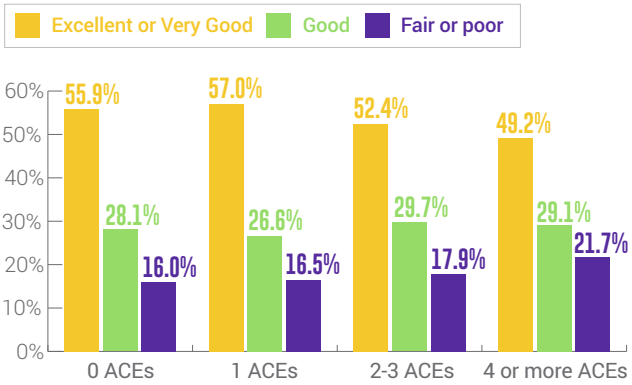


Figure 11: Relationship between ACE score and how adults perceive their health

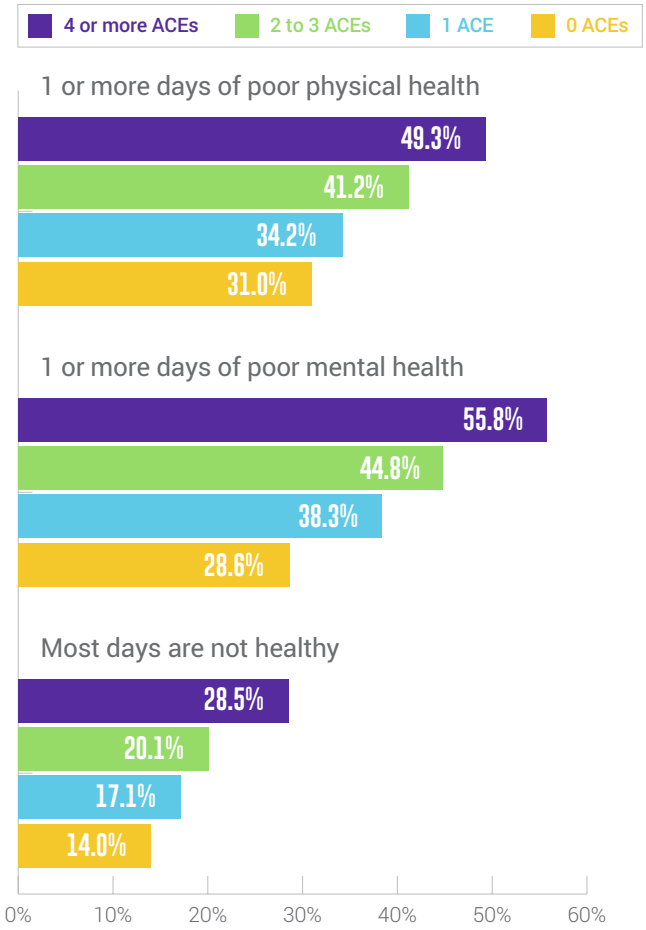


Figure 12: Relationship between ACE score and the number of healthy days

ADULTS WITH 4 OR MORE ACES ARE:

- **1.59 times** as likely to report one or more days of poor physical health in the past 30 days
- **Almost twice** (1.95 times) as likely to report one or more days of poor mental health in the past month
- **2.14 times** as likely to report that their poor health – physical or mental – had prevented them from participating in their usual activities

The impact of high numbers of ACEs is particularly apparent when California adults were asked to report on the effect of arthritis on their everyday lives. There was a strong dose-response relationship between the number of ACEs and the impact of arthritis on an individual's day-to-day activities. As the number of ACEs increased, adults were increasingly likely to report that arthritis caused serious or severe joint pain and interfered with their normal activities a lot compared to adults with no ACEs. Thus, although the prevalence of arthritis increased only slightly (see Figure 9) in persons with four or more ACEs, the impact of arthritis on a person's day-to-day life appears to be far greater in individuals who have experienced four or more ACEs.

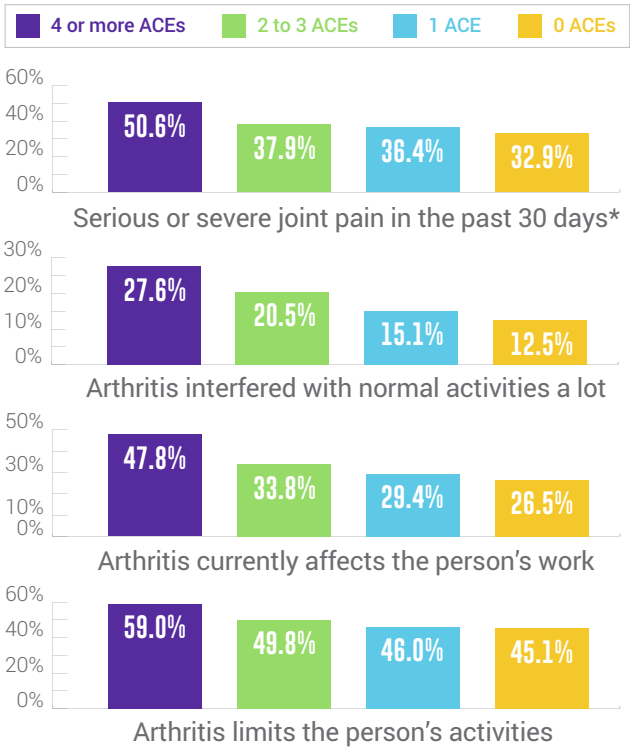


Figure 13: Relationship between ACE score and arthritis effect
* Individuals rated their average pain from 6 to 10 on a pain scale

ACES AND HEALTH BEHAVIORS

LEO'S STORY

Leo is a 35-year old man living in Northern California. He grew up in an affluent community in the Bay Area. When he was eight years old, his parents divorced and Leo and his sister went to live with his mother. Two years later, his mother remarried. However, soon after he moved in, his stepfather began to sexually abuse Leo. Leo's stepfather would also threaten and demean him. Although his mother witnessed Leo's stepfather's verbal abuse, she blamed Leo for making his stepfather angry – withdrawing her affection and becoming very distant. Leo began spending as much time as he could at school and at his friends' houses but no one ever questioned his behavior. The abuse lasted until Leo left home to attend college. In order to cope with depression, Leo began drinking and smoking in high school and has never been able to stop. He now struggles to maintain stable housing and employment.

Leo has 4 ACEs

- Parental separation or divorce
- Sexual abuse
- Verbal abuse
- Emotional neglect

In numerous studies, researchers have found strong correlations between ACEs and negative health behaviors. Among California adults, high numbers of ACEs, similarly, correlate with risky health behaviors.

A PERSON WITH 4 OR MORE ACES IS:

- **2.93 times** as likely to be a current smoker
- **3.23 times** as likely to engage in binge drinking
- **3.30 times** as likely to engage in risky sexual behavior[11]

Although early research hypothesized that the emotional impact of ACEs caused individuals to engage in risky behavior, emerging research indicates that chronic adversity affects the area of the brain implicated in substance dependence, increasing the likelihood of addiction and other high risk behaviors.[12]

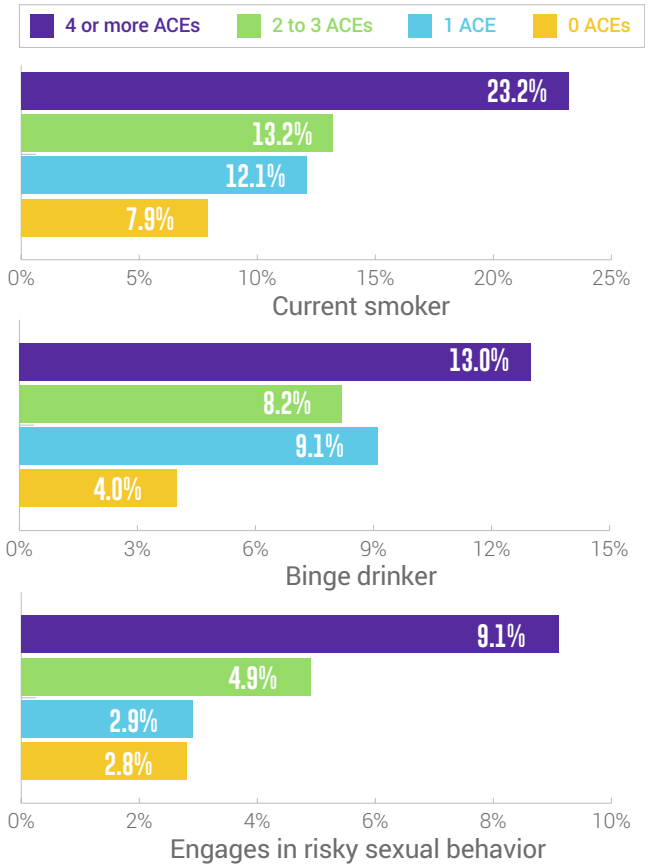


Figure 14: Relationship between ACE score and risky health behaviors

ACES AND ACCESS TO HEALTHCARE

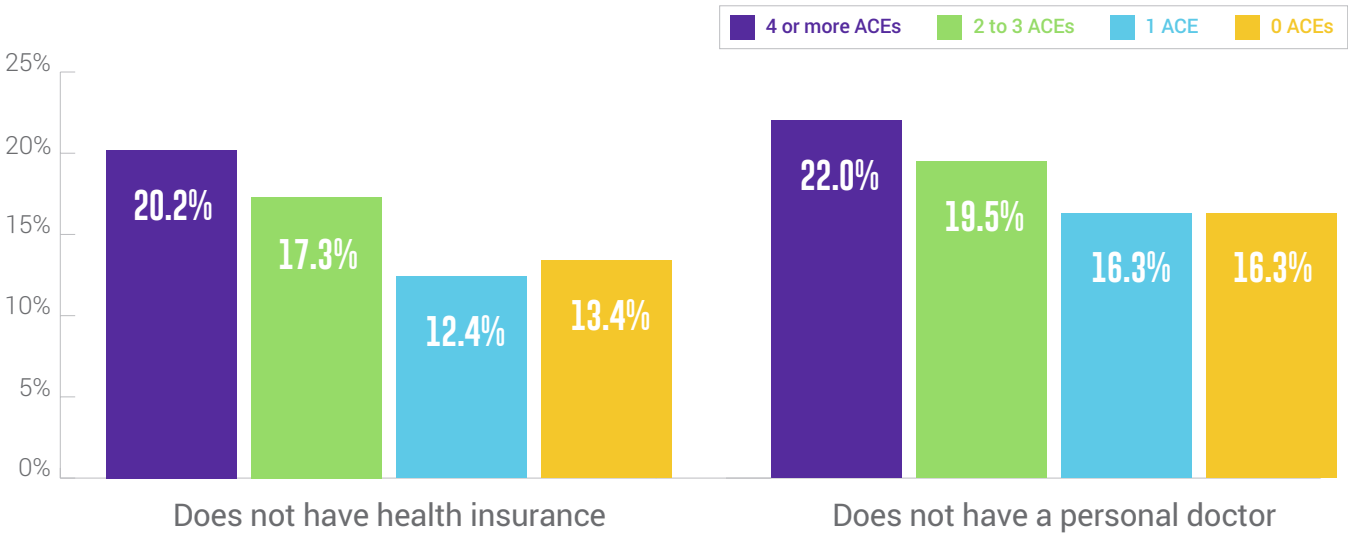


Figure 15: Relationship between ACE score and access to healthcare

Among Californians, high numbers of ACEs also appear to correlate with limited access to health care. Adults with four or more ACEs are **50% more likely** to lack health insurance as compared to those who have no ACEs. Individuals lacking health insurance or access to regular healthcare often delay seeking medical services, resulting in untreated medical conditions and increased emergency room visits.

ACES AND CHILD WELFARE

High numbers of ACEs, unsurprisingly, have strong correlations with involvement in the child welfare system. In California, a person with four or more ACEs is **12.96 times** as likely to have been removed from her home as a child as compared to a person with no ACEs. In 2012, over 350,000 California children received a Child Protective Services response for an allegation of child maltreatment.[13] Of the 76,026 children who were found to be victims of maltreatment in 2012, 86.7% were found to have suffered from neglect and 18.3% were found to have suffered from emotional abuse.[14]

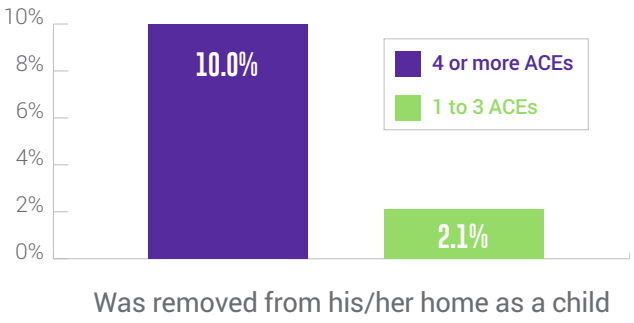


Figure 16: Relationship between ACE score and removal from home during childhood

ACES AND SEXUAL VIOLENCE

Alarmingly, high numbers of ACEs increase the likelihood that a person will be the victim of intimate partner violence or sexual violence in adulthood. Studies have shown that a woman with three violent ACEs is **3.5 times** as likely to become a victim of intimate partner violence and a man with 3 or more violent ACEs is **3.8 times** as likely to perpetrate intimate partner violence.[15] In California, an individual with four or more ACEs is **11.6 times** as likely to report being forced to have sex ***after*** the age of 18.

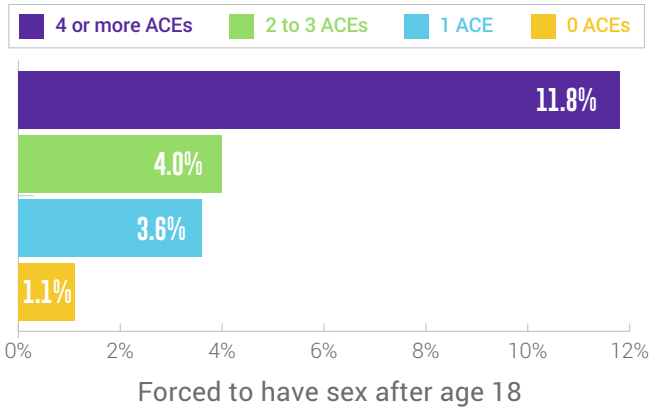


Figure 17: Victim of sexual violence in adulthood

AN OPPORTUNITY TO HELP CALIFORNIA THRIVE

ACEs and their impact on the health and welfare of Californians are a reality that cannot be ignored. The science and data are clear. The findings from four years of BRFSS data illustrate, all too clearly, the lifelong consequences of unaddressed adverse experiences in childhood. California must seize this opportunity to promote the health and success of California's children and families by addressing the impact of ACEs.

Annual state-level data collection on the prevalence of ACEs: Continuing state-level data collection on the prevalence of ACEs throughout California is necessary to craft effective strategies and policies to address the impact of ACEs on local communities. Data collection efforts must also expand to examine the relationship between ACEs and other systems that impact the lives of children, including child welfare and juvenile justice.

Increase awareness about ACEs and their impact on health and wellness in communities across California: Public education must be a priority in crafting an effective response to ACEs. Change can begin from the ground up as more communities join the movement to address chronic adversity in childhood.

Increase access to health care, including mental health services, for all Californians: By improving access to quality, affordable health care, including mental health services, we can work to prevent the onset of chronic, life-changing diseases and prevent the harm of untreated mental illness.

Support efforts to identify evidence-based practices to screen for and respond to ACEs across systems: ACEs do not have to determine a person's life trajectory. Early identification and intervention can help stem the impacts of ACEs and toxic stress on a person's brain and body. At the Center for Youth Wellness, children and youth are routinely screened for ACEs to ensure targeted and enhanced care.

Advance efforts to integrate behavioral and physical health care practices: ACEs impact the health of the whole person mentally and physically. More must be done to explore and advance efforts to integrate behavioral and physical health care practices to heal the individual – body and mind.

REFERENCES

[1] Robert F. Anda, et al., The enduring effects of abuse and related adverse experiences in childhood: A convergence of evidence from neurobiology and epidemiology, 256 EUROPEAN ARCHIVES OF PSYCHIATRY AND CLINICAL NEUROSCIENCE 174 (2006).

[2] Centers for Disease Control and Prevention, ACE Study Participant Demographics, ADVERSE CHIILHOOD EXPERIENCES (ACE) STUDY (Jan. 18, 2013), available at http://www.cdc.gov/ace/demographics.htm.

[3] Centers for Disease Control and Prevention, Prevalence of Individual Adverse Childhood Experiences, ADVERSE CHILDHOOD EXPERIENCES (ACE) STUDY (Jan. 18, 2013), available at http://www.cdc.gov/ace/prevalence.htm.

[4] Id.

[5] Vincent J. Felitti, et al., Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) study, 14 AMERICAN J. OF PREVENTATIVE MEDICINE 245 (1998).

[6] David W. Brown, et al., Adverse Childhood Experiences and the Risk of Premature Mortality, 37 AM. J. PREV. MED. 389 (2009).

[7] Sara B. Johnson, et al., The science of early life toxic stress for pediatric practice and advocacy, 131 PEDIATRICS 319 (2013), available at http://pediatrics.aappublications.org/content/131/2/319.full.

[8] Supra Note 7, Johnson; Jack P. Shonkoff, et al., The lifelong effects of early childhood adversity and toxic stress, 129 PEDIATRICS e232 (2012), available at http://pediatrics.aappublications.org/content/129/1/e232.full.pdf; National Scientific Counsel on the Developing Child, EXCESSIVE STRESS DISRUPTS THE ARCHITECTURE OF THE DEVELOPING BRAIN: WORKING PAPER #3 (2014), available at http://developingchild.harvard.edu/index.php/resources/reports_and_working_papers/working_papers/wp3.

[9] Id.

[10] All prevalence ratios are based on a comparison to persons with zero ACEs.

[11] "Engage in risky sexual behavior" is based on a positive response to the following instructions on BRFSS telephone survey: "I'm going to read you a list. When I'm done, please tell me if any of the situations apply to you. You don't need to tell me which one. You have used intravenous drugs in the past year. You have been treated for a sexually transmitted or venereal disease in the past year. You have given or received money or drugs in exchange for sex in the past year. You had anal sex without using a condom in the past year. Do any of these situations apply to you?"

[12] Supra Note 8, Shonkoff; Centers for Disease Control and Prevention, Pyramid, ADVERSE CHILDHOOD EXPERIENCES (ACE) STUDY (Jan. 18, 2013), available at http://www.cdc.gov/ace/pyramid.htm; Charles L. Whitfield, M.D., The Adverse Childhood Experience (ACEs) Study: A Summary, available at: http://www.cbwhit.com/ACEstudy.htm.

[13] U.S. Department of Health and Human Services, Administration for Children & Families, Children's Bureau, Child Welfare Outcomes Report Data, CALIFORNIA CONTEXT DATA 2009-2012 (Sept. 29, 2014), available at http://cwoutcomes.acf.hhs.gov/data/downloads/pdfs/california.pdf.

[14] Id.

[15] Charles L. Whitfield, et al., Violent Childhood Experiences and the Risk of Intimate Partner Violence in Adults, 18 J. OF INTERPERSONAL VIOLENCE 166 (2003). "Violent Childhood Experiences" was defined as physical abuse, sexual abuse, and witness domestic violence.

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APPENDIX A

METHODOLOGY

Prepared by Survey Research Group, Public Health Institute, Danielle Ewing, MPH, Suzanne Ryan-Ibarra, MS, MPH, Michael Wright, MA, Marta Induni, PhD

PARTICIPANTS

We used four years of data from the California Behavioral Risk Factor Surveillance System (CA BRFSS) 2008, 2009, 2011, and 2013 to estimate the prevalence of adverse childhood experiences (ACEs) according to demographic, social, and health-related characteristics. CA BRFSS is a cross-sectional, population-based telephone survey of non-institutionalized households, and methods have been described elsewhere.[1] Briefly, using random digit dialing, one adult age 18 or older per household was randomly selected to participate in a telephone interview. Respondents were interviewed in English, Spanish, or Chinese (Cantonese or Mandarin) (2009 only). In 2013, the sampling frame included landlines and cellular telephones. In earlier years (2008-2011), the sampling frame included only landline telephones. CA BRFSS data are weighted to account for the complex sampling design, adjust for non-response and households without telephones, and balance the sample so that it matches the California population's age, gender, and race/ethnicity distribution.

Data from four years were used to increase sample size. The prevalence of ACEs was similar for each of the four years (Table A). In the combined four years, there were a total of 27,745 respondents. After excluding participants without complete information on ACEs (n=5,200) our analytic, combined sample included 22,545 adults.

	2008		2009		2011		2013	
Before age 18…	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Experienced verbal abuse[a]	1,587	32.5	1,489	32.2	3,489	37.3	1,037	38.4
Parents divorced or separated	1,336	27.2	1,170	25.8	2,249	25.4	820	28.9
Household member abused substances[b]	1,349	27.0	1,131	22.8	2,568	27.1	822	27.6
Experienced physical abuse[c]	913	19.2	853	17.9	1,868	20.7	630	22.1
Witnessed domestic violence[d]	706	15.7	627	14.9	1,635	18.8	564	21.3
Household member mentally ill[e]	749	14.3	680	13.6	1,520	16.1	469	16.4
Experienced sexual abuse[f]	591	11.0	476	8.6	1,336	11.8	449	14.5
Parent or adult caretaker ever fail to provide for basic needs[g]	241	9.0	372	8.9	-	-	290	10.0
Household member in jail, prison, or convicted to serve time	241	6.7	193	5.4	442	6.9	198	7.4

Table A: Prevalence of ACEs in 2008, 2009, 2011 and 2013

[a] Said yes to "Did a parent or adult in your home ever swear at you, insult you, or put you down?"

[b] Said yes to "did you live with anyone who was a problem drinker or alcoholic?" or "Did you live with anyone who used street drugs or who abused prescription medication?"

[c] Said yes to "Not including spanking, did a parent or adult in your home ever hit, beat, kick, or physically hurt you in any way?"

[d] Said yes to "Did your parents or adults in your home ever hit, punch, or beat each other up?"

[e] Said yes to "Did you live with anyone who was depressed, mentally ill, or suicidal?"

[f] Said yes to "Did an adult or anyone at least 5 years older than you try to make you touch them sexually?" or "Did an adult or anyone at least 5 years older than you ever touch you sexually?", or "Did an adult or anyone at least 5 years older than you force you to have sex?", or "Did an adult or anyone at least 5 years older than you ever sexually abuse you?"

[g] Said yes to "Did a parent or adult caretaker ever fail to provide for your basic needs, such as food, clothing, medical care, hygiene, or fail to protect you from known dangers?" This question was not asked in 2011.

ADVERSE CHILDHOOD EXPERIENCES

The standard ACE optional module from the Centers for Disease Control and Prevention was used to collect data on ACEs before the age of 18 among participants in the CA BRFSS in 2008, 2009, 2011, and 2013. The questions included in the ACE module are listed in Table A. The questions in the module were identical for all four years, with the following exceptions: 1) sexual abuse was assessed using slightly different, but comparable, questions in 2008 versus 2009, 2011, and 2013, and 2) a question to assess neglect was added in California for years 2008, 2009, and 2013.

An ACE score variable was created for use in analyses. An answer of "yes" to one of the ACE questions contributed 1 point to the ACE score. Because there were multiple questions that asked about sexual abuse and parental substance abuse, only one point was given for a "yes" answer to the sexual abuse and substance abuse questions, respectively. The ACE score variable was coded as: 0 ACEs, 1 ACE, 2-3 ACEs, or 4 or more ACEs. When sample size was too small to permit using this coding, ACE categories were combined. For example, for some county estimates, ACEs categories were collapsed and coded as: 0 ACEs, 1-3 ACEs, or 4 or more ACEs. This secondary coding was consistently used when the standard coding could not be utilized.

STATISTICAL ANALYSIS

First, sample characteristics were compared with the CA population. Next, prevalence rates of ACEs according to each individual ACE question as well as overall ACE score were estimated. Prevalence of ACEs was examined according to: Demographics, Health Conditions, Arthritis Burden, Chronic Conditions, Healthy Days (Self-Rated Health), Healthcare, Health Behaviors, Foster Care, Mental Health, Social Factors, and Sexual Violence. Prevalence ratios and 95% confidence intervals were estimated using Cox proportional-hazards regression. Prevalence ratios were estimated instead of odds ratios because odds ratios tend to be artificially inflated if the prevalence of the outcome variable (in this case, ACEs) is higher than 10%.[2]

To examine the stability and reliability of the prevalence estimates, three criteria were used: 1) sample size greater than or equal to 30, 2) confidence interval range less than 20, and 3) coefficient of variation less than 30. If an estimate did not meet all three of these criteria, it was considered unstable and unreliable, and the cell was highlighted in a light orange color. If an estimate was found to be unstable and unreliable, the recommendation was to withhold publication in the report.

All analyses were conducted with the combined dataset (years 2008, 2009, 2011, and 2013) and with single years. Some years did not include every variable in the analyses. Only findings from the combined dataset are included in this report. Survey weights were applied in all analyses so that estimates would be representative of the CA population. Survey weights were rescaled for use with the combined dataset. Analyses were conducted using SAS survey procedures, version 9.3.

REFERENCES

[1]. Ryan-Ibarra S, Induni M, Zuniga M, Ewing D. California Behavioral Risk Factor Surveillance System SAS Dataset Documentation and Technical Report: 1984 - 2012. Survey Research Group, Public Health Institute; 2013.

[2]. Spiegelman D. Easy SAS Calculations for Risk or Prevalence Ratios and Differences. Am J Epidemiol. 2005;162(3):199-200. doi:10.1093/aje/kwi188.

APPENDIX B

	California population, 2010[a]		CA BRFSS 2008, 2009, 2011, and 2013, Unweighted Sample		CA BRFSS 2008, 2009, 2011, and 2013, Weighted Sample	
	n	%	n	%	n	%
Overall	27,958,916	100.0	27,745	100.0	27,958,916	100.0
Age						
18-24 years	3,922,951	14.0	1,286	4.6	3,923,023	14.0
25-34 years	5,317,877	19.0	2,820	10.2	5,317,918	19.0
35-44 years	5,182,710	18.5	4,333	15.6	5,182,733	18.5
45-54 years	5,252,371	18.8	5,111	18.4	5,252,350	18.8
55-64 years	4,036,493	14.4	5,715	20.6	4036450	14.4
65+ years	4,246,514	15.2	8,480	30.6	4,246,443	15.2
Gender						
Male	13,761,238	49.2	11,092	40.0	13,761,248	49.2
Female	14,197,678	50.8	16,653	60.0	14,197,668	50.8
Race/ethnicity						
Non-Hispanic White	12,409,858	44.4	17,785	64.1	12,409,888	44.4
Non-Hispanic African American/Black	1,640,279	5.9	1,203	4.3	1,640,279	5.9
Hispanic or Latino	9,257,499	33.1	6,740	24.3	9,257,484	33.1
Non-Hispanic Asian, Pacific Islander, Other	4,651,280	16.6	2,017	7.3	4,651,265	16.6
Education[b]						
High School	4,650,042	19.3	3,495	12.6	4,413,177	16.3
High School Diploma, GED	5,012,413	20.8	5,538	20.0	5,935,093	21.9
Some College	7,183,474	29.8	7,143	25.7	6,795,761	25.1
Bachelor's	4,610,875	19.1	6,155	22.2	5,902,699	21.8
Master's or higher	2,640,396	11.0	4,889	17.6	4,070,622	15.0

Table B: Demographics of the 2010 California adult population compared to California Behavioral Risk Factor Surveillance System (CA BRFSS) sample, 2008, 2009, 2011, and 2013.

[a] Source: State of California, Department of Finance, California State Data Center, Census 2010 Summary File 1. Adults ages 18 and older. Counts may not match exactly due to rounding.

[b] Source: American Community Survey 1-year estimates for 2010. Adults ages 25 and older. CA BRFSS data is not weighted for education, so the weighted sample will not match the CA population data.

APPENDIX C

Before age 18…	n	%	95% CI[b]
Did you live with anyone who was a problem drinker or alcoholic?	5,171	22.17	(21.30-23.03)
Did you live with anyone who used street drugs or who abused prescription medications?	1,834	9.84	(9.20-10.48)
Did you live with anyone who was convicted of a crime and sentenced to serve time in a prison, jail, or other corrections facility?	1,074	6.60	(6.04-7.16)
Did you live with anyone who was depressed, mentally ill, or suicidal?	3,418	15.07	(14.32-15.81)
Did your parents or adults in your home ever hit, punch or beat each other up?	3,532	17.59	(16.75-18.44)
Were your parents ever separated or divorced because of marital problems?	5,575	26.74	(25.80-27.69)
Not including spanking, did a parent or adult in your home ever hit, beat, kick, or physically hurt you in any way?	4,264	19.94	(19.09-20.79)
Did a parent or adult in your home ever swear at you, insult you, or put you down?	7,602	34.99	(33.97-36.02)
Did an adult or anyone at least 5 years older than you try to make you touch them sexually?	1,063	8.09	(7.32-8.86)
Did an adult or anyone at least 5 years older than you ever touch you sexually?	1,468	10.49	(9.73-11.26)
Did an adult or anyone at least 5 years older than you ever sexually abuse you?	1,067	9.85	(8.90-10.80)
Did an adult or anyone at least 5 years older than you force you to have sex?	531	3.85	(3.38-4.31)
Did a parent or adult caretaker ever fail to provide for your basic needs, such as food, clothing, medical care, hygiene, or fail to protect you from known dangers?[c]	903	9.36	(8.51-10.20)

Table C: Prevalence of individual adverse childhood experiences among adults in California, California Behavioral Risk Factor Survey, 2008, 2009, 2011, and 2013[a]

[a] Data weighted to 2010 California population.

[b] CI = confidence interval

[c] Not asked in 2011.

Before age 18…	n	%	95% CI[b]
Experienced verbal abuse[c]	7,602	34.99	(33.97-36.02)
Parents divorced or separated	5,575	26.74	(25.80-27.69)
Household member abused substances[d]	5,870	26.16	(25.24-27.08)
Experienced physical abuse[e]	4,264	19.94	(19.09-20.79)
Witnessed domestic violence[f]	3,532	17.59	(16.75-18.44)
Household member mentally ill[g]	3,418	15.07	(14.32-15.81)
Experienced sexual abuse[h]	2,852	11.43	(10.77-12.09)
Parent or adult caretaker ever fail to provide for basic needs[i]	903	9.36	(8.51-10.20)
Household member in jail, prison, or convicted to serve time	1,074	6.60	(6.04-7.16)

Table D: Prevalence of ACEs by ACE type[a]

[a] Data weighted to 2010 California population.

[b] CI = confidence interval

[c] Said yes to "Did a parent or adult in your home ever swear at you, insult you, or put you down?"

[d] Said yes to "Did you live with anyone who was a problem drinker or alcoholic?" or "Did you live with anyone who used street drugs or who abused prescription medications?'

[e] Said yes to "Not including spanking, did a parent or adult in your home ever hit, beat, kick, or physically hurt you in any way?"

[f] Said yes to "Did your parents or adults in your home ever hit, punch or beat each other up?"

[g] Said yes to "Did you live with anyone who was depressed, mentally ill, or suicidal?"

[h] Said yes to "Did an adult or anyone at least 5 years older than you try to make you touch them sexually?" or "Did an adult or anyone at least 5 years older than you ever touch you sexually?", or "Did an adult or anyone at least 5 years older than you force you to have sex?", or "Did an adult or anyone at least 5 years older than you ever sexually abuse you?"

[i] Said yes to "Did a parent or adult caretaker ever fail to provide for your basic needs, such as food, clothing, medical care, hygiene, or fail to protect you from known dangers?" This question was asked in 2008, 2009, and 2013.

APPENDIX D

	0		1		2 OR 3		4 OR MORE	
County	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Alameda	381	43.0	218	19.1	227	25.4	116	12.5
Butte	78	23.5	60	26.3	57	19.9	54	30.3
Fresno	215	39.6	132	25.0	117	18.3	99	17.1
Imperial[c]	44	42.7	--	--	--	--	--	--
Kern	212	37.5	147	28.5	118	19.3	85	14.7
Los Angeles	1302	39.3	792	22.6	790	24.6	436	13.5
Marin	98	39.0	50	21.3	56	20.7	42	19.0
Orange	758	40.7	411	22.9	376	22.1	215	14.2
Riverside	525	35.5	297	20.4	310	24.6	238	19.5
Sacramento	394	37.5	214	20.0	248	22.8	188	19.6
San Bernardino	435	37.5	257	20.0	270	23.0	206	19.4
San Diego	849	41.0	439	20.3	472	24.2	300	14.5
San Francisco	209	44.1	142	25.3	140	21.5	71	9.0
San Joaquin	171	38.6	95	25.4	74	16.1	60	19.9
San Luis Obispo	94	32.9	50	13.7	84	33.4	45	20.0
San Mateo	210	46.1	126	23.6	95	18.2	51	12.0
Santa Barbara	126	42.5	79	19.6	85	24.7	43	13.3

Table E: Prevalence of ACEs among residents in California counties[a, b]

	0		1		2 OR 3		4 OR MORE	
County	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Santa Clara	508	46.6	257	22.6	224	19.8	126	11.0
Stanislaus	154	34.8	74	14.5	85	27.0	67	23.7
Ventura	224	39.8	125	20.6	126	24.4	75	15.2
Colusa, Glenn, Tehama, Lake	72	33.9	35	14.5	63	30.4	36	21.3
Plumas, Sierra, Siskiyou, Lassen, Modoc, Trinity, Del Norte, Shasta	159	31.2	94	19.2	103	26.6	84	23.0
Mariposa, Mono, Tuolumne, Alpine, Amador, Calaveras, Inyo, El Dorado	173	33.8	95	21.0	129	28.5	60	16.7
Monterey, Santa Cruz	194	36.3	111	18.6	144	24.5	90	20.5
Mendocino, Humbolt	98	24.9	73	21.0	79	23.3	62	30.8
Napa, Sonoma	243	35.5	129	18.2	147	24.2	124	22.0
Kings, Tulare	159	38.9	86	21.1	80	21.2	49	18.8
Nevada, Placer	189	33.4	118	24.3	136	25.9	76	16.4
Yuba, Sutter, Yolo	103	33.3	62	25.6	76	28.3	44	12.8
Solano, Contra Costa	386	39.3	203	21.2	220	24.0	133	15.4
San Benito, Merced, Madera	129	38.2	72	24.6	83	24.9	44	12.3

Table E: Prevalence of ACEs among residents in California counties[a, b] (Continued)

[a] Data weighted to the 2010 California population

[b] In some cases, data from geographically and demographically similar counties were combined to allow for reliable reporting

[c] Sample size was too small to be reliably reported

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