

# Adverse Childhood Experiences

Understanding Health Risks Across Generations  
in Illinois and Chicago

Findings from the Illinois 2013 Behavioral Risk Factor Surveillance Survey  
Illinois ACEs Response Collaborative

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# Executive Summary

Childhood is often referred to as the “formative years,” and a robust and growing body of research indicates that this is literally true, especially when it comes to the impact of childhood trauma. Adverse Childhood Experiences (ACEs)—including abuse, neglect, and household stress—have been shown to be associated with chronic diseases and social and emotional problems later in adulthood. ACEs tend to cluster together, and the more ACEs a person has, the more likely poor health behaviors and outcomes become.

**This report examines the prevalence of ACEs among adults in Illinois and Chicago, including assessing racial/ethnic and gender differences, and the association of ACEs with negative health outcomes.**

The goal is to provide the audience—policy makers, practitioners, and advocates—with an understanding of how common ACEs are and how widespread their impact is in Illinois. It is hoped that by raising awareness, there will be increased commitment to mitigating the impact of ACEs and preventing ACEs in future generations of Illinoisans.

Although ACEs are common across all U.S. and Illinois communities, it is important to note that they can have a greater impact among high need populations. ACEs and the social determinants of health—the conditions in which people are born, grow, live, work, and age—interact in complex ways. This report can only begin to explore that interaction and some of the existing inequities in Illinois. Through the work of the Illinois ACEs Response Collaborative, we anticipate delving into these issues further and offering policy solutions.

# Background

## The Adverse Childhood Experiences Study

The Adverse Childhood Experiences Study was a landmark public health study that investigated the long-term effect of adverse childhood experiences (ACEs) on physical, mental, emotional, and social wellbeing. Started in 1995, the study was a combined effort from the Centers for Disease Control (CDC) and Kaiser Permanente of San Diego. Researchers surveyed over 17,000 insured adults about their history of ten different ACEs, which spanned three different domains of abuse, neglect, and household stressors (figure 1). They also asked the participants about a range of physical, mental, and social problems from adolescence to adulthood.

To understand the link between ACEs and prospective health outcomes, researchers developed an “ACE score,” in which each type of trauma was counted as one point. Thus, an individual’s ACE score could range from zero to 10; zero if the individual had not experienced any ACEs, and 10 if he or she had experienced all 10.

### Three Key Findings from the original ACE Study

- 1 ACEs are **common** and tend to **occur in groups**.
- 2 The **more ACEs a person has had**, the **higher likelihood** of unwanted health, behavioral, and social outcomes.
- 3 ACEs are associated with **early mortality**.

Figure 2: Key findings from the CDC-Kaiser Permanente ACE Study

### What are ACEs?

Adverse childhood experiences, or ACEs, are traumatic experiences that can have a profound impact on a child’s development and a lasting effect on their health throughout their lifetime. Ten different categories of ACEs spread across three domains were included in the original ACE Study.

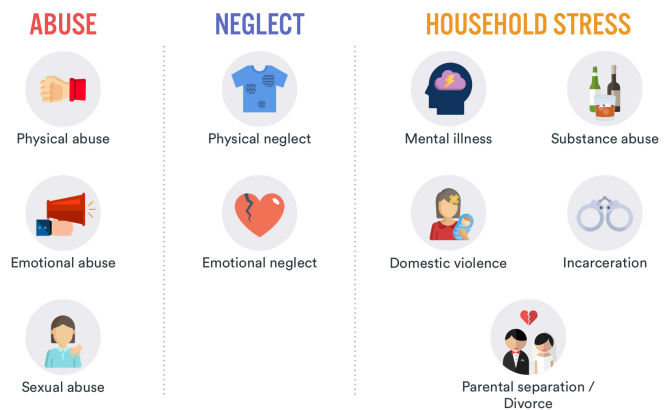


Figure 1: The 10 categories of adverse childhood experiences included in the original ACEs Study

The ACE Study made three striking discoveries (figure 2). First, researchers found that ACEs were unexpectedly common; in this mostly Caucasian, middle class, and college-educated participant group, 64% reported at least one or more ACE. Second, researchers found that the more ACEs a person had, the higher the likelihood he or she would experience a wide array of adverse health and behavioral outcomes in adulthood, including: heart disease, lung cancer, diabetes, stroke, COPD, autoimmune diseases, depression, interpersonal violence, substance use disorders, and suicide. Third, individuals with six or more ACEs were found, on average, to live 20 years less than those individuals with zero ACEs.

Today, a version of the ACE Study has become a module available for use in the Behavioral Risk Factor Surveillance System (BRFSS). States have the option of using the BRFSS ACE module. Illinois used the ACE module in 2013 for the first time.

## The Toxic Stress Response

Extensive research on the biology of stress shows that healthy development can be derailed by excessive or prolonged activation of the body's stress response systems, with damaging effects on learning, behavior, and health.

Learning to cope with stress is an important part of child development. When we are threatened, our bodies prepare us to respond by increasing our heart rate, blood pressure, and stress hormones, such as cortisol and epinephrine. This process represents activation of the sympathetic nervous system, which is regulated by our brains.

When a young child's stress response systems are activated within an environment of supportive adult relationships, these physiological effects are buffered and brought back down to baseline. The result is the development of healthy stress response systems.

However, toxic stress occurs when a child experiences strong, frequent, and/or prolonged adversity — physical or emotional abuse, chronic neglect, caregiver substance abuse or mental illness, exposure to violence, and/or the accumulated burdens of family economic hardship — in the absence of adequate adult support. Prolonged activation of the stress response during early childhood can disrupt brain development and function, which, along with cognitive impairment, can lead to imbalances in hormone levels, impairment of the immune system, persistent systemic inflammation, and metabolic disease.

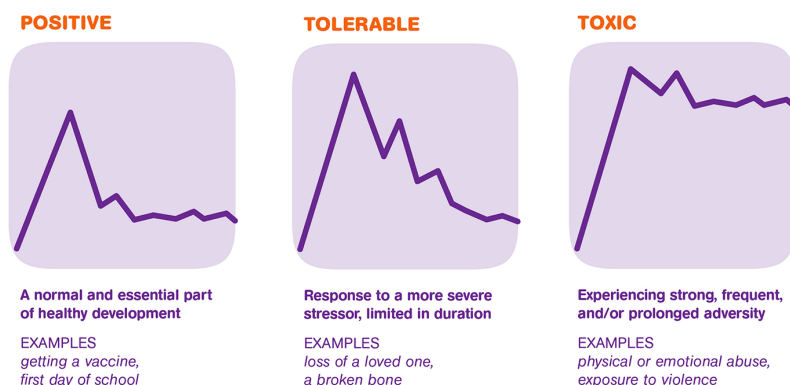


Figure 2. Discoveries from the ACE Study  
Source: Center for the Developing Child: [www.developingchild.harvard.edu](http://www.developingchild.harvard.edu)

## Resilience Reduces Damage from Stress

### Four factors that promote resilience in children



The availability of at least one stable, caring, and supportive relationship with an adult caregiver.



Building a sense of mastery over life circumstances.



The development of strong executive functioning and self-regulation skills.



The supportive context of affirming faith or cultural traditions.

Figure 3: Factors that promote resiliency in children.

Adapted from National Scientific Council on the Developing Child. (2015). Supportive Relationships and Active Skill-Building Strengthen the Foundation of Resilience: Working Paper 13. [www.developingchild.harvard.edu](http://www.developingchild.harvard.edu).

Even with exposure to toxic stress, protective factors can mitigate the effects of adversity and make a child more likely to thrive. Resilience is the adaptive ability to return to being healthy and hopeful after experiencing adverse events. Building resilience is an ongoing process influenced by factors at the individual, family, and community level (figure 3). For example,

Resilience transforms potentially *toxic stress* into *tolerable stress*.



mindfulness practices, adequate sleep, and good nutrition can help a child overcome stress. Meeting the basic needs of a family can facilitate strong attachment between child and caregiver, which is one of the most important factors for cultivating resilience. Additionally, strong social networks and community resources can promote healthy development. With the help of these and other factors, individuals can reverse unhealthy brain development and recover from toxic stress.

# The Behavioral Risk Factor Surveillance System (BRFSS)

## Brief Overview

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The Behavioral Risk Factor Surveillance System (BRFSS) contains data from a sample of Illinois adults ages 18 years and older. In 2013, approximately 5,600 Illinois adults took part in the survey which included questions about ACEs along with other questions about many aspects of health and health care. Using the information provided by those in the sample, it is possible to make very reliable estimates about how the close to ten million adults in Illinois would describe themselves and their health. While no firm causal conclusions should be drawn, the findings can encourage broad discussion about ACEs in Illinois and guide decision-making about program and policy.

For more information regarding the methodology used in this report, please see the appendix.



# 2013 Illinois and Chicago BRFSS ACE Findings

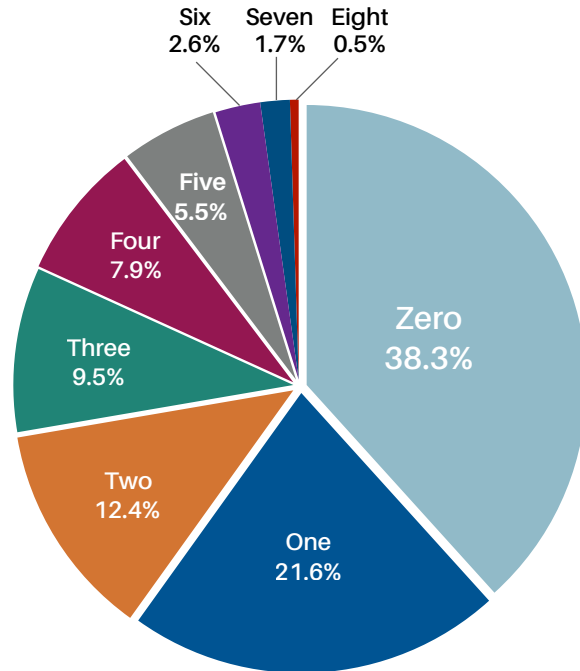


Data Source: All tables and figures were generated from the 2013 Illinois Behavioral Risk Factor Surveillance Survey (Illinois Department of Public Health)

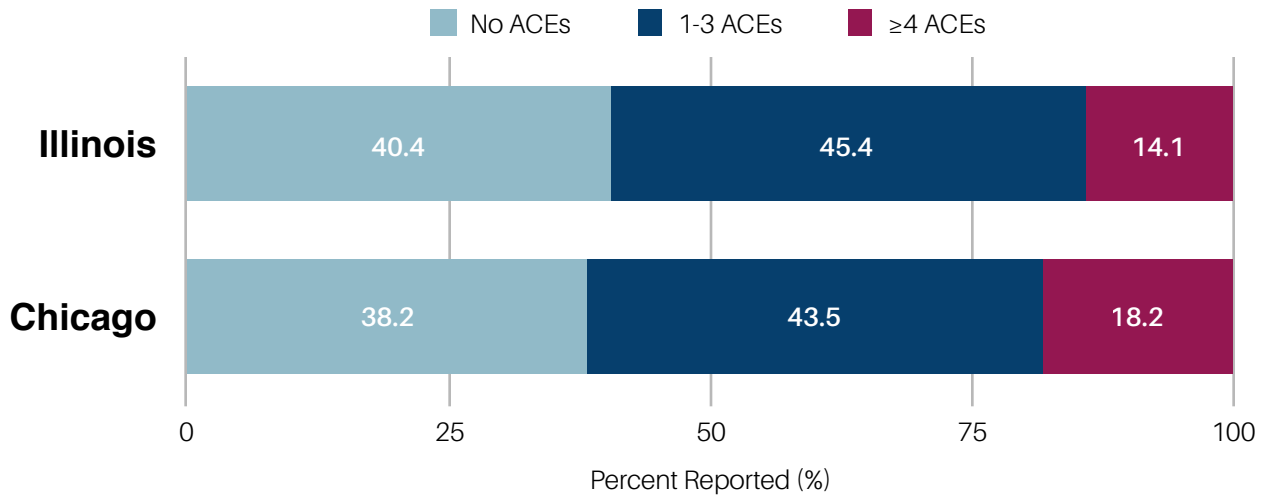
# Prevalence of ACEs among Illinois and Chicago adults

Almost 60% of non-institutionalized adults in Illinois say they had at least one ACE— this number equates to almost **5 million** Illinois residents. **14.2%** of Illinois adults reported four or more ACEs. In the original ACE Study, 12.5% of adults reported four or more ACEs.

Percent of Adults in Illinois Who Reported Adverse Childhood Experiences



Percent of Adults in Illinois and Chicago Who Reported ACEs



Over 60% of non-institutionalized Chicago adults say they had at least one ACE. This number equates to approximately **1.2 million** Chicago residents.

Having experienced four or more ACEs was more common for Chicago adults compared with adults in the rest of Illinois.



The following table shows how **Illinois** adults responded to each ACE question. The weighted percent of adults who answered each question "yes" is shown along with the weighted number of adults. The highest percent for an individual ACE was 33.5% for verbal abuse. Notably, 16% reported physical abuse and almost 10% reported sexual abuse.

### Type of ACEs Reported by **Illinois** Adults

Type of ACE	Estimated % of Adults Who Had Specific ACE	Estimated # of Adults Who Had Specific ACE
<b>Direct Experience of Physical, Verbal, or Sexual Abuse:</b>		
Kicked, beaten, or otherwise physically hurt ( <b>physical abuse</b> )	15.5%	1,220,523
Sworn at, insulted, or put down ( <b>emotional abuse</b> )	33.5%	2,643,662
Made to sexually touch, be touched, or forced to touch ( <b>sexual abuse</b> )	9.8%	771,628
<b>Lived in a Stressful or Abusive Home with Parents or Other Adults Who:</b>		
Were depressed, had mental illness, or were suicidal ( <b>mental illness</b> )	14.5%	1,143,700
Used alcohol or illegal or prescription drugs ( <b>substance use disorders</b> )	26.2%	2,070,716
Were in prison or jail ( <b>incarceration</b> )	6.2%	490,681
Were physically abusive toward each other ( <b>domestic violence</b> )	16.1%	1,271,325
Were divorced or separated ( <b>parental separation</b> )	24.8%	1,962,464

The following table shows how **Chicago** adults responded for each ACE question. The weighted percent of adults who answered each question "yes" is shown along with the weighted number of adults. The highest percent for an individual ACE was 35.6% for verbal abuse. Compared to Illinois adults overall, Chicago adults reported a higher prevalence of physical abuse, sexual abuse, substance use disorders, incarcerated household members, domestic violence, and parental separation.

### Type of ACEs Reported by **Chicago** Adults

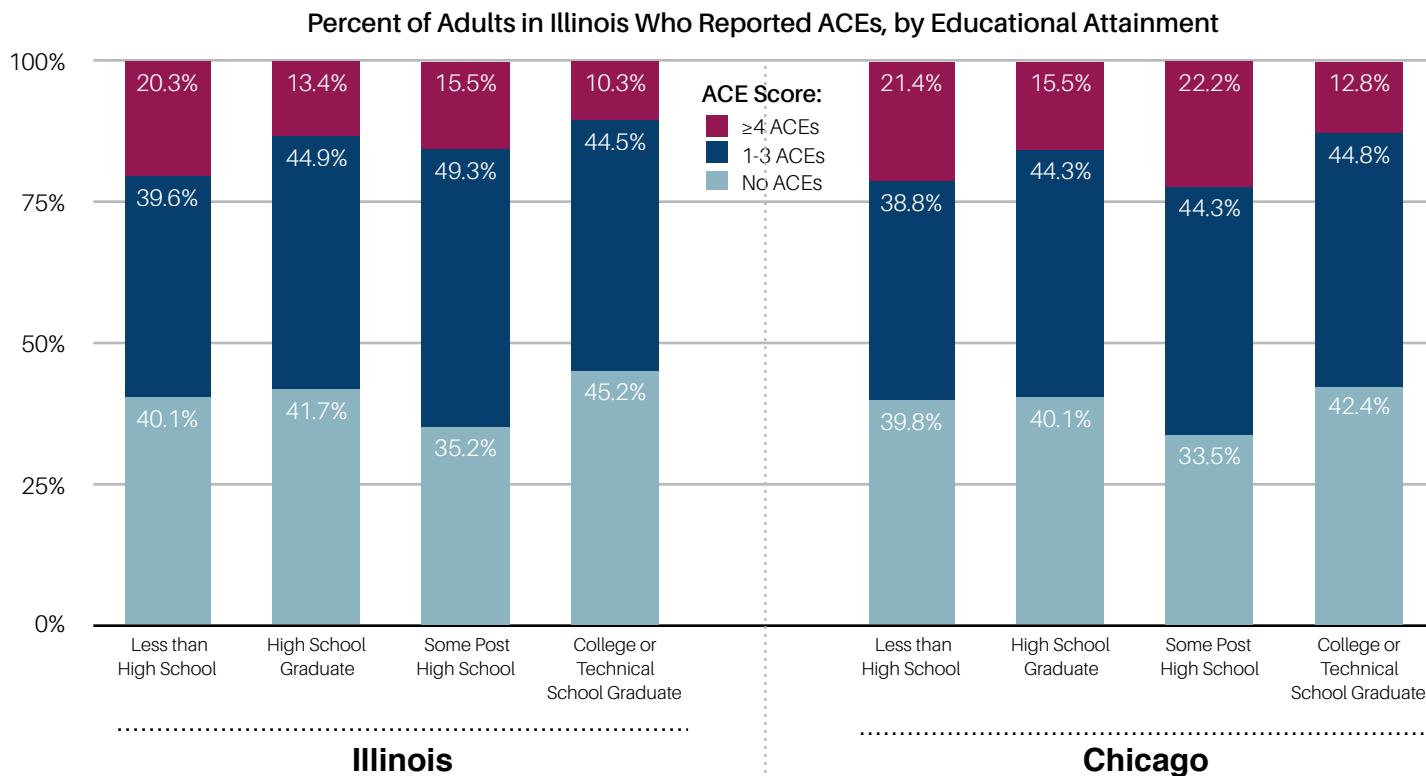
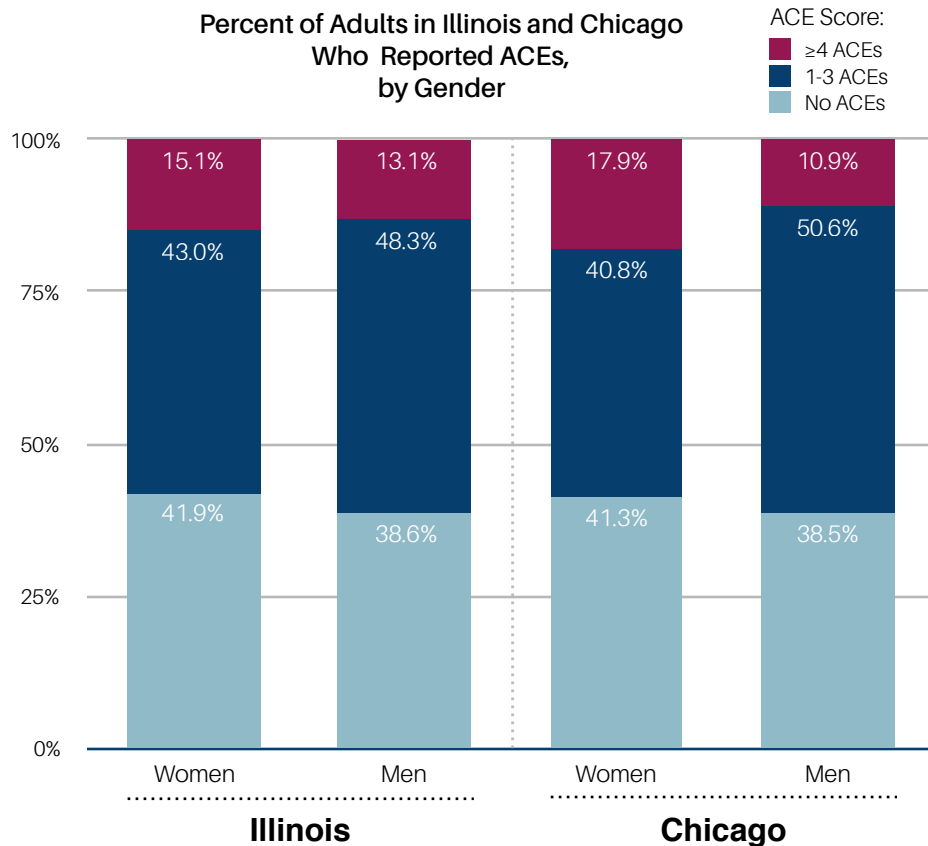
Type of ACE	Estimated % of Adults Who Had Specific ACE	Estimated # of Adults Who Had Specific ACE
<b>Direct Experience of Physical, Verbal, or Sexual Abuse:</b>		
Kicked, beaten, or otherwise physically hurt ( <b>physical abuse</b> )	18.7%	386,748
Sworn at, insulted, or put down ( <b>emotional abuse</b> )	35.6%	737,358
Made to sexually touch, be touched, or forced to touch ( <b>sexual abuse</b> )	12.8%	264,433
<b>Lived in a Stressful or Abusive Home with Parents or Other Adults Who:</b>		
Were depressed, had mental illness, or were suicidal ( <b>mental illness</b> )	14.0%	291,170
Used alcohol or illegal or prescription drugs ( <b>substance use disorders</b> )	28.7%	595,330
Were in prison or jail ( <b>incarceration</b> )	8.0%	165,940
Were physically abusive toward each other ( <b>domestic violence</b> )	19.9%	413,055
Were divorced or separated ( <b>parental separation</b> )	28.0%	580,820

# Prevalence of ACEs by demographics among IL and Chicago Adults

Having at least one ACE was reported by approximately 60% of both adult men and adult women in Illinois and Chicago.

In Illinois, approximately one in seven women and one in eight men reported experiencing four or more ACEs.

In Chicago, about one in six women reported experiencing four or more ACEs, compared to one in nine men.



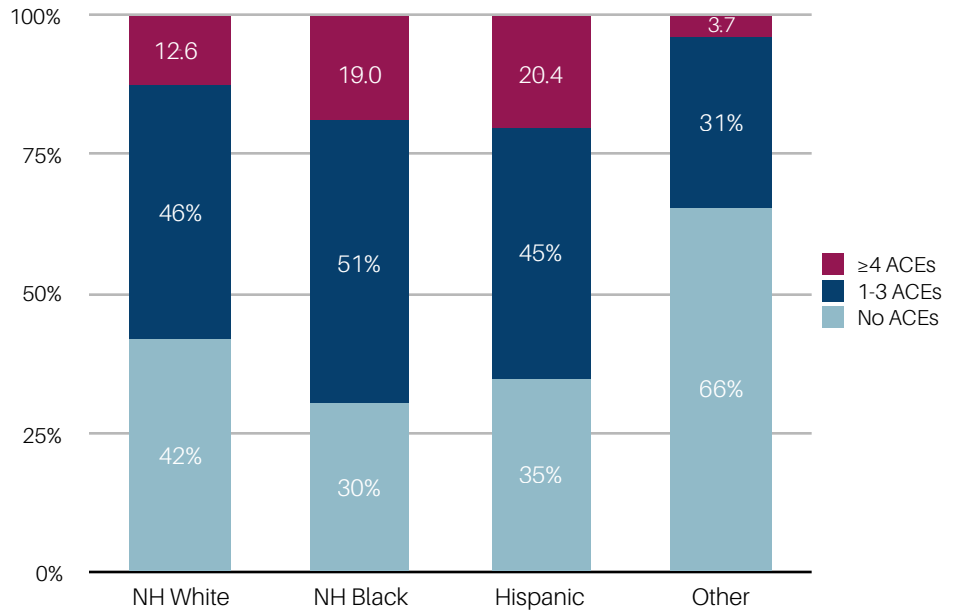
Approximately one in five of those who did not finish high school reported four or more ACEs, while only one in 10 of those with a post high school degree reported four or more ACEs.

While there is not a clear trend in the relationship between education and ACEs, Chicago adults with the highest level of education—college or technical school graduates—had the lowest proportion, reporting four or more ACEs.

In the original ACE Study, researchers found that 64% of a mostly white, middle class, and college educated participant group had at least one ACE or more. This finding was noteworthy for two reasons: (1) ACEs were surprisingly common, and (2) It challenged a widely held belief that childhood adversity was a problem only in disadvantaged communities, especially communities of color. We now know, unequivocally, that childhood adversity occurs across all races and socioeconomic classes. Nonetheless, due in large part to structural and historical factors that have differentially impacted communities of color, disparities in experiences of childhood adversity exist.

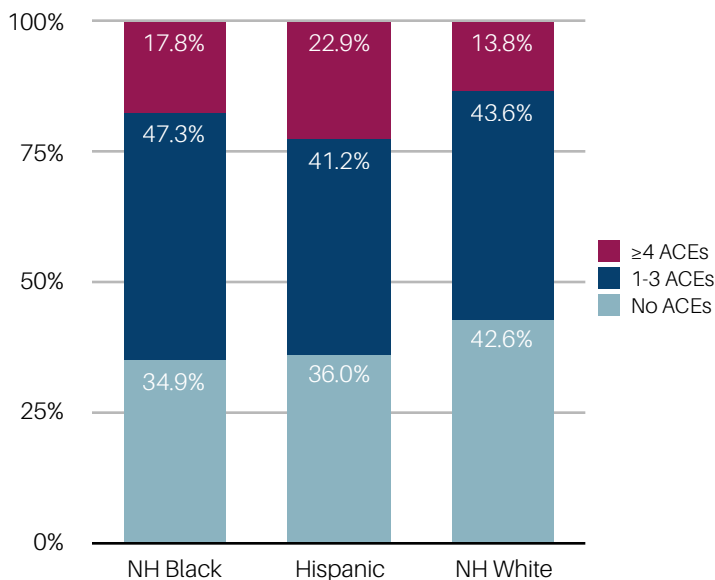
Approximately 20% of African American and Hispanic adults in Illinois reported four or more ACEs, compared to 13% of non-Hispanic whites.

**Percent of Adults in Illinois\* Who Reported ACEs, by Race & Ethnicity**

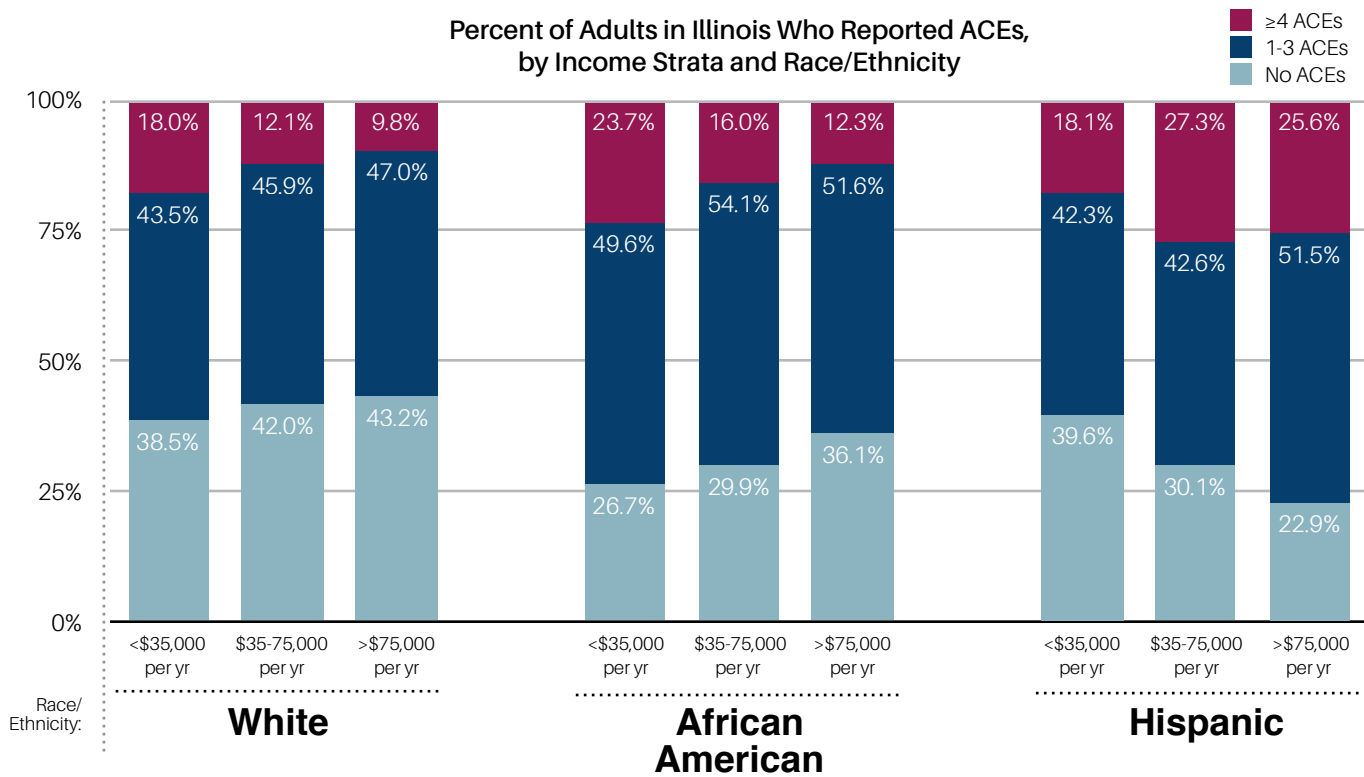


\*Chicago-specific data were unavailable due to sample size limitations.

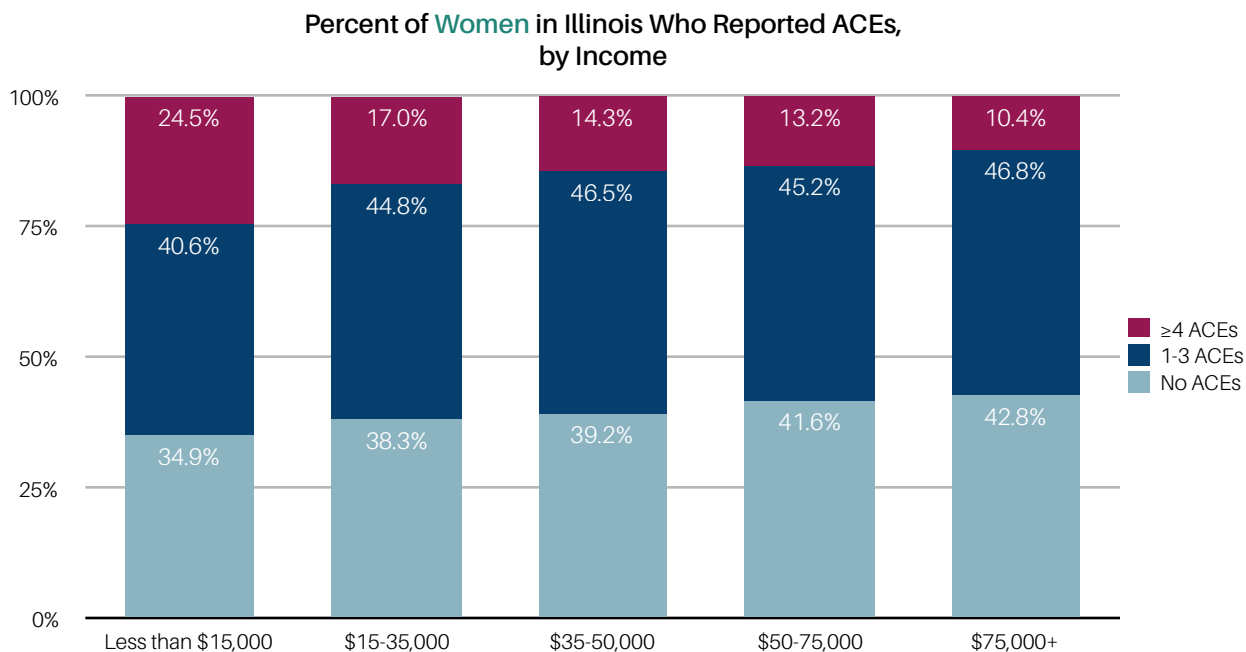
**Percent of Women in Illinois Who Reported ACEs, by Race & Ethnicity**



Focusing specifically on women, 23% of Hispanic women reported experiencing four or more ACEs, compared to 18% of African American women and 14% of white women.



In African Americans and white adults in Illinois, the prevalence of individuals reporting four or more ACEs was highest in the lowest income group (less than \$35,000/year). For these race/ethnicity groups, the proportion reporting four or more ACEs becomes successively smaller at higher income categories. However, this gradient was not observed for Hispanic respondents, who had the highest proportion of adults with four or more ACEs in the middle income (\$35,000-\$75,000) bracket. Hispanic adults also accounted for the highest proportion of adults reporting no ACEs in the lowest income group (39.6%) compared to other races. Somewhat unexpectedly, Hispanics had the smallest proportion of adults with no ACEs in the highest income group (22.9%) compared to other races (whites 43.2%, African Americans 36.1%).



Among Illinois women, the proportion of four or more ACEs became smaller at successively higher income brackets (24.5% in less than \$15,000 group vs 10.4% in \$75,000+ group), reflecting a gradient between income level and ACE scores.

# ACEs and self-reported health-related quality of life

The 2013 Illinois and Chicago BRFSS collected responses on self-reported physical and mental health. Individuals were asked, “Now thinking about your physical (or mental health), for how many days during the past 30 days was your physical health not good?”

**Average Number of Days per Month Illinois and Chicago Adults Reported Physical Health Not Good According to Number of ACEs**

ACEs	Illinois Days per Month	Chicago Days per Month
≥4	5.6	6.9
1-3	3.8	5.8
0	3.4	5.1

Illinois and Chicago adults who had higher ACE scores also reported a greater number of days of physical health “not good” in the past 30 days.

On average, Chicago adults reported a higher number of days of physical health as being “not good” compared to Illinois adults for each ACE score category.

**Average Number of Days per Month Illinois and Chicago Adults Reported Mental Health Not Good According to Number of ACEs**

ACEs	Illinois Days per Month	Chicago Days per Month
≥4	6.9	8.3
1-3	3.6	4.9
0	2.5	3.6

Similar to self-reported physical health, Illinois and Chicago adults who had higher ACE scores also reported a higher number of days of mental health “not good” in the past 30 days.

Chicago adults reported a higher number of days of mental health as being “not good” compared to Illinois adults for each ACE score category.

**Self-Reported Quality of Life Outcomes By Number of ACEs in Illinois Adults**

ACEs	Activity Limitations Due to Physical, Mental, or Emotional Problems (%)	Difficulty Concentrating or Remembering (%)	Unemployment (%)	Being Unable to Work (%)
≥4	26.4	20.0	13.4	6.7
1-3	18.2	6.3	6.9	5.1
0	13.8	5.3	4.2	3.2

If ACEs are associated with poor physical and mental health, it follows that quality of life measures would be related to ACEs as well. Illinois adults with higher ACE scores were more likely to report having activity limitations, difficulty concentrating, unemployment, and inability to work. A stark contrast was observed for “difficulty concentrating or remembering” between individuals with no ACEs (5.3%) vs those with four or more ACEs (20%). Similarly, adults with four or more ACEs were much more likely to report unemployment compared to adults with no ACEs.

# ACEs and self-reported chronic disease outcomes

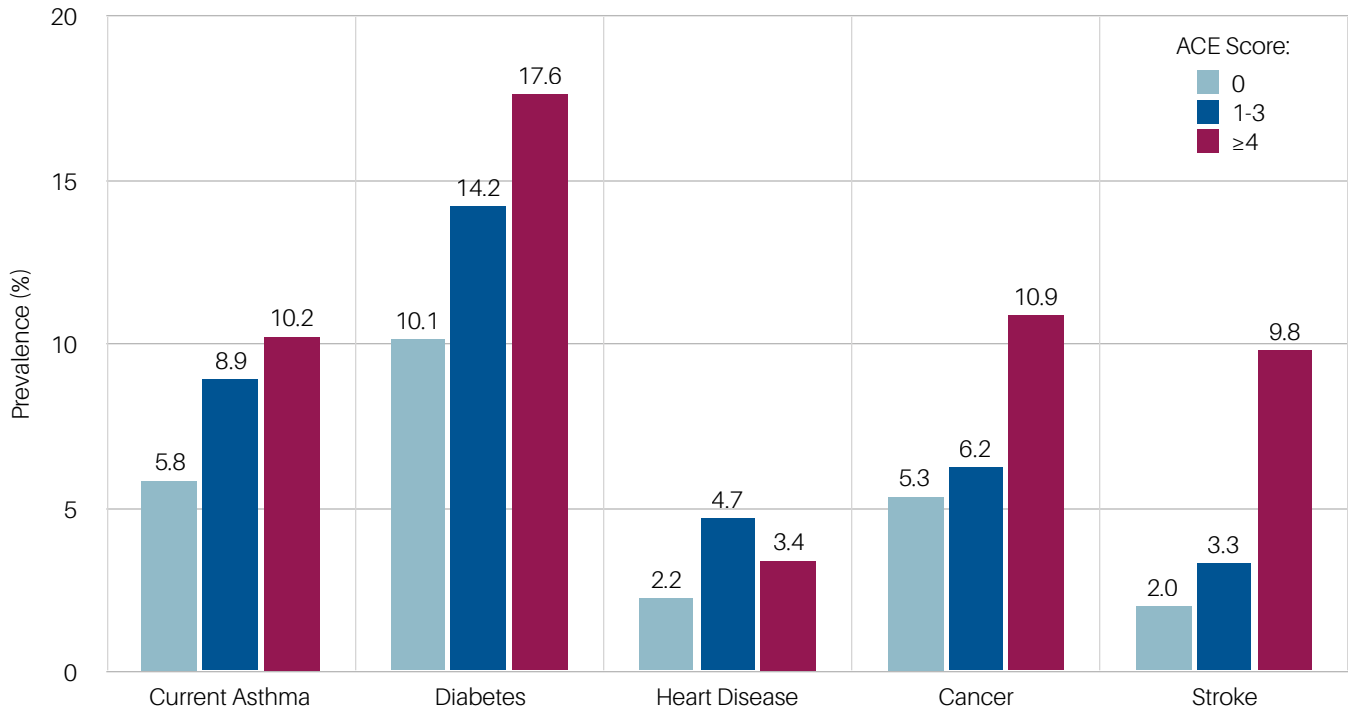
The 2013 Illinois BRFSS collected data on several self-reported chronic diseases. Similar to what was observed in the original ACE Study, individuals with four or more ACEs were more likely to report having a given chronic disease compared to individuals with fewer ACEs.

Percent of Illinois Adults Who Reported Having at Least One Chronic Condition\* According to Number of ACEs

ACEs	Percent	95% CI
≥4	60.8	54.5, 67.0
1-3	49.5	46.4, 52.6
0	44.6	41.6, 47.7

\*Defined as currently having asthma and/or ever having been diagnosed with a heart attack, angina, coronary heart disease, stroke, cancer, COPD, emphysema, chronic bronchitis, arthritis, a depressive disorder, or kidney disease; data are self-reported.

Proportion of Illinois Adults Ages 45-64 Who Reported Specific Chronic Disease According to Number of ACEs



In almost every chronic disease that was asked about in the 2013 IL BRFSS, a step-wise gradient was observed between ACE scores and the proportion of adults aged 45-64 reporting chronic disease. Adults with no ACEs accounted for the smallest proportion of each chronic disease. This pattern was in contrast to adults with 4 or more ACEs, who reported the highest proportion of a given chronic disease. One exception was heart disease, which was likely limited by the age range studied (45-64 years-old) and relatively small number of adults reporting this outcome.

Altogether, while these percentages do not directly represent measures of risk, they nonetheless highlight an alarming yet consistent trend across the majority of studies investigating the health effects of ACEs: individuals with high ACE scores (four or more) have a higher prevalence of chronic disease compared to adults with lower ACE scores.

## ACEs and self-reported health-risk behaviors

The original ACE Study observed strong associations between ACEs and various health-risk behaviors, such as tobacco and substance use disorders, alcohol abuse, and high risk sexual behavior. The 2013 IL BRFSS included questions on smoking and obesity, a health-state that substantially increases risk of numerous poor health outcomes.

The proportion of adults reporting obesity and current smoking was higher among those with one to three ACEs compared to adults reporting no ACEs, and highest among those with four or more ACEs. Almost one-third of adults with no ACEs reported obesity, but this number nearly approached 40% among adults with four or more ACEs. The prevalence of smoking was almost three times greater among adults with four or more ACEs, compared to adults with no ACEs.

**Proportion of Illinois Adults Who Reported Obesity and Smoking, By Number of ACEs**

ACEs	Obesity	Current Smoking
≥4	37.1	27.5
1-3	31.2	19.8
0	27.2	10.5



# Conclusion

## Policy Recommendations

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The Illinois ACEs Response Collaborative calls on policymakers to apply this information about ACEs in Illinois to policy development, decision making, and resource allocation.

Important policy strategies include:

- **Adopt a life course perspective through support of programs and policies that prevent ACEs in children and youth, mitigate the impact of childhood adversity in adults, and interrupt the intergenerational transmission of ACEs.**
- **Incorporate ACEs-informed components in efforts to promote health equity.**
- **Assess policies for their potential--whether intentional or inadvertent--to contribute to ACEs and subsequent detrimental effects on adult health and wellbeing.**

The Illinois ACEs Response Collaborative has previously published policy briefs on health, education and justice. The Collaborative will continue to use data regarding ACEs in Illinois to inform and refine policy recommendations and programmatic best practices.

## Future Directions

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This initial report on findings from the 2013 BRFSS in Illinois provides an overview of the prevalence of ACEs and their association with negative health outcomes in adulthood. As we move forward, it will be important to examine the connection between ACEs and social determinants of health, to assess the impact of different clusters of ACEs, and to identify ways in which findings related to ACEs in Illinois are similar to or differ from those in other states. The Illinois ACEs Response Collaborative welcomes the participation of researchers who are interested in partnering to explore these questions and their implications for the health of people in Illinois.

# Appendix

## Sampling in the BRFSS

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Because the BRFSS is not a simple random sample of Illinois adults, but has a more complex sampling design, special statistical procedures were used to estimate means, percents, and counts to reflect all Illinois adults. The sampling design as well as the techniques used for analysis are all intended to ensure the accuracy of the findings. For more information on the sampling methodology, See the CDC's Data User Guide at [https://www.cdc.gov/brfss/data\\_documentation/pdf/UserguideJune2013.pdf](https://www.cdc.gov/brfss/data_documentation/pdf/UserguideJune2013.pdf)

In this report, also be aware that any survey respondent with missing data for any ACE is excluded from the analysis.

For statistics about Chicago adults, rather than the state as a whole, an additional statistical approach was required to ensure that estimates of means, percents, and counts are more precise. The methodology used here was based on work carried out by the Child and Adolescent Health Measurement Initiative (CAHMI) (<http://www.cahmi.org/>). It involved producing what are called "synthetic estimates" which are calculated by combining Census data with the BRFSS survey data in order to adjust the data from Chicago respondents so that they more accurately reflect what would have been obtained had a random sample been directly drawn from the city's adult population.

The CAHMI methodology which is described here <http://childhealthdata.org/docs/nsch-docs/local-use-of-state-data-and-synthetic-estimates.pdf?sfvrsn=4> uses both race/ethnicity and income to adjust local area data, but this report uses only income data for Chicago since results were very similar whether income and race/ethnicity were used together or income was used by itself. This simplified approach was used to gain some statistical power, but even this approach could not fully overcome the small number of Chicago adults who were actually in the BRFSS sample. Many factors related to ACEs, therefore, cannot be presented due to the unreliability of the estimates.

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We would like to thank Dr. Deborah Rosenberg who, in collaboration with her colleague Ms. Linda Rosul, conducted the analysis of the BRFSS data and produced several initial reports. We appreciate Dr. Rosenberg's continued commitment to the data work of the IL ACEs Response Collaborative

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# About Us

## Health & Medicine Policy Research Group (Health & Medicine)

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Health & Medicine is a Chicago based non-profit working to improve the health of all people in Illinois by promoting health equity. Founded in 1981 by Dr. Quentin Young, it was formed as an action-oriented policy center—nimble, independent, and focused on regional health issues. Health & Medicine’s mission is to promote social justice and challenge inequities in health and health care. It conducts research, educates and collaborates with other groups to advocate policies and impact health systems to improve the health status of all people. Health & Medicine has successfully developed health policy recommendations and implementation strategies for different public and private entities, earning the trust of the legislature, advocates, the media, researchers and policymakers at all levels of government in Illinois to become the region’s “honest broker” on healthcare policy matters. Learn more at [www.hmprg.org](http://www.hmprg.org).

## The Illinois ACEs Response Collaborative

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Established in 2011, the [Illinois ACEs Response Collaborative](http://www.hmprg.org/Programs/IL+ACE+Response+Collaborative) (the Collaborative) represents a broad range of organizations and agencies committed to expanding and deepening the understanding of the impact of childhood trauma and ACEs on the health and well-being of Illinois families and communities. The Collaborative works to develop education, policies, and responses to assist those who have experienced a high level of adversity, while simultaneously developing strategies to reduce the frequency and impact of ACEs as well as preventing their transmission to the next generation. Learn more by visiting <http://hmprg.org/Programs/IL+ACE+Response+Collaborative>, or by contacting Lara Altman, Director of the ACEs Program at Health & Medicine at [altman@hmprg.org](mailto:altman@hmprg.org).

