

State of Alaska
Epidemiology



Bulletin

Recommendations
and
Reports

Department of Health

Heidi Hedberg, MS, Commissioner
Anne Zink, MD, Chief Medical Officer

3601 C Street, Suite 540
Anchorage, Alaska 99503

Division of Public Health

Lindsey Kato, MPH, Director

<https://health.alaska.gov/dph/epi>
24 Hour Emergency 1-800-478-0084
Local (907) 269-8000

Editors:

Joe McLaughlin, MD, MPH
Jared Parrish, PhD, MS

Volume No. 23 Number 4

Epidemiology of Adverse Childhood Experiences in Alaska

Contributed by Robyn Husa, PhD
Section of Women's, Children's, & Family Health
Division of Public Health

December 11, 2023

Acknowledgements: Thank you to the following people for their contributions to this report – Riley Fitting, Kathy Perham-Hester, and Margaret Young, Section of Women's, Children's, and Family Health; Anna Frick, Section of Epidemiology; Ingrid Johnson, University of Alaska Anchorage Justice Center; Patrick Sidmore, Department of Education and Early Development; Abigail Newby-Kew, Section of Chronic Disease Prevention and Health Promotion; Grant Rich, Division of Behavioral Health.

Table of Contents

Epidemiology of Adverse Childhood Experiences in Alaska.....	1
Executive Summary	3
1.0 Introduction.....	5
1.1 Measurement of ACEs.....	5
1.2 Health Consequences	7
1.3 Aims	8
2.0 Methods.....	8
2.1 Alaska Longitudinal Child Abuse and Neglect Linkage Project	9
2.2 National Survey of Children’s Health.....	10
2.3 Alaska Behavioral Risk Factor Surveillance System.....	11
2.4 Alaska Victimization Survey	11
3.0 Results.....	12
3.1 Early Childhood (0–3 Years).....	12
3.2 Childhood (0–17 Years).....	13
3.3 Adult ACEs.....	14
3.4 Adult Women ACEs	14
4.0 Prevention	15
4.1 Strengthen Economic Supports to Families.....	15
4.2 Promote Social Norms that Protect Against Violence and Adversity	15
4.3 Ensure a Strong Start for Children.....	16
4.4 Teach Children Necessary Skills	16
4.5 Connect Youth to Caring Adults and Activities	17
4.6 Intervene to Lessen Immediate and Long-Term Harms	17
4.7 Additional Alaska Programs and Frameworks	18
5.0 Discussion.....	19
6.0 Limitations	22
7.0 Conclusion	23
8.0 Figures and Tables	25
9.0 References.....	41

Executive Summary

Adverse childhood experiences (ACEs) are potentially traumatic events that occur in childhood (ages 0–17 years) and have been linked to negative health, behavioral, and economic outcomes in adulthood. Preventing ACEs is a Centers for Disease Control and Prevention (CDC) priority. Often included as ACEs, though not exclusively, are child abuse and neglect and household/community challenges, such as witnessing violence, substance abuse, or experiencing financial hardship. This report uses multiple public health data sources to provide an overview of ACEs prevalence, document disparities, and assess trends over time in Alaska. It also broadly describes prevention infrastructure in Alaska. Reporting periods for this report are broken up into early childhood (ages 0–3 years), childhood (ages 0–17 years), and adulthood (ages 18+; retrospective ACE reports from adults). Comparing estimates between data sources is inadvisable due to differences in ACE definitions and ages of the participants between sources. However, each of these sources provide a unique perspective across a lifespan.

Composite ACE definitions within each source were kept consistent over time to facilitate trending (Table 1). When taken as a whole, results underscore the commonality of ACEs among the Alaska population, highlight the disproportionate impact experienced by certain population groups, and draw attention to the unchanging burden of ACEs on the Alaska population over time.

During 2012–2020, based on 13 ACEs measured (9 household challenges, 4 maltreatment), an estimated 47% of 3-year-old children in Alaska experienced at least one ACE, and 9% experienced four or more. Trends for each ACE score over zero remained flat over time, but prevalence for zero ACEs among 3-year-old children trended slightly upward. Prevalence clustered toward the lower end of ACEs (i.e., less than two) for most racial groups except for Black and Alaska Native/American Indian 3-year-old children, who had the two highest percentages of four or more ACEs (20% and 17%), respectively. Similarly, young children enrolled in Medicaid were disproportionately affected by ACEs. They had three times the prevalence of four or more ACEs as those not enrolled. The most common early childhood ACE was familial financial hardship, followed by parental job loss.

During 2016–2021, based on 8 ACEs measured (all household/community challenges), an estimated 41% of children aged ≤17 years in Alaska experienced at least one ACE. This estimate is consistent with national estimates of 40% using the same data source. An estimated 8% of Alaska children experienced four or more ACEs. Rates of zero ACEs increased over the 6-year period, ranging from 55% in 2017 to 64% in 2020. Meanwhile, prevalence for one ACE declined slightly over time. Trends for other ACE composite scores appeared flat. Alaska Native/American Indian children had the highest percent of four or more ACEs (18%). Like early childhood estimates, there was an unequal distribution of ACE scores between children with different Medicaid enrollment statuses. Children enrolled in Medicaid had a lower percentage of zero ACEs (37%) and higher percentage of four or more ACEs (16%) compared to their counterparts, who showed the opposite pattern (zero ACEs: 72%; four or more ACEs: 3%). The most common ACE was parental divorce or separation, followed by familial financial hardship.

During 2013–2015, based on 8 ACEs measured (5 household challenges, 3 maltreatment), an estimated 68% of adults aged 18 years or older in Alaska reported experiencing at least one ACE during their childhood, and 20% reported experiencing four or more. This Alaska rate of experiencing at least one ACE is higher than the 2015–2017 national estimate of 61% using the same data source. Overall ACE trends remained relatively consistent over the 3-year period. A higher percentage of females (24%) reported experiencing four or more ACEs during childhood than males (17%). Alaska Native/American Indian adults and adults who identified as multiracial/other race had the highest percentage of four or more ACEs (both 30%), followed closely by adults who ethnically identified as Hispanic or Latino (27%). Finally, a slightly higher percentage of Alaska adults living below the

100% Alaska federal poverty guideline (FPG) experienced four or more ACEs (29%) than those who were not below the FPG (20%). The most common ACE retrospectively reported was mental injury (emotional/psychological abuse).

In 2020, based on 8 ACEs measured (5 household challenges, 3 maltreatment), an estimated 79% of adult women aged 18 years or older in Alaska reported experiencing at least one ACE during childhood, and 34% reported experiencing four or more. Adult women who identified as two or more races had the highest percentage of four or more ACEs (55%), followed by Alaska Native/American Indian adult women (43%). A higher percentage of women who experienced financial stress during adulthood reported experiencing four or more ACEs (42%) than those who did not experience financial stress (22%). The most common ACE for adult women was mental injury.

Although it is a complex issue requiring comprehensive efforts, ACEs and their effects can be prevented or mitigated, and Alaska has many prevention and intervention programs. Culturally appropriate ACE prevention efforts are needed at early (i.e., pre-birth) and frequent intervals to ensure responsiveness to dynamic family circumstances. Connecting families to Home Visiting and/or care coordination/navigation programs and family support specialists who are familiar with resources available in Alaska can help families connect with the services appropriate for their unique circumstances.

1.0 Introduction

Stable, nurturing environments and relationships are essential to children's health and wellbeing. When such relationships or environments are not consistently available, children become at risk for adverse childhood experiences (ACEs). ACEs are potentially traumatic events that occur in childhood (ages 0–17 years).¹ They include childhood maltreatment and exposure to household or other environmental challenges that can undermine the child's sense of safety, stability, and bonding. Examples of childhood challenges are growing up in a household with substance abuse, violence, untreated mental illness, or instability due to parental separation or incarceration. Exposure to multiple ACEs, especially in the absence of protective factors, increases the risk of death, acute and chronic diseases, and mental health and substance use challenges in adulthood.^{2–5}

ACEs are common among the United States population. According to the Centers for Disease Control and Prevention (CDC),^{6,7} about 61% of adults surveyed in 2019 across 25 states reported experiencing at least one ACE prior to 18 years of age. In addition, nearly one in six (15.6%) reported they had experienced four or more ACEs. While all children can experience ACEs, some populations experience an unequal burden. Research suggests these disparities are driven by historical, social, and economic pressures that impact the environments in which they live.^{8–10} For example, persons identifying as gay, lesbian, or bisexual report higher average ACE exposures compared to their heterosexual identifying peers.^{9,11} Similarly, compared to their counterparts, higher ACE exposures were found for persons identifying as multiracial; having less than a high school education; or unemployed, unable to work, or having an annual income of less than \$15,000.⁹ Because disparities in ACEs among different populations exist, it is important to measure ACE prevalence and discuss prevention efforts within and across multiple populations. In addition, measuring ACE distributions and trends occurring among the early childhood, adolescent, and adult populations can fully describe the burden

experienced across the life-course. The current report examines ACE prevalence within the Alaska population.

1.1 Measurement of ACEs

There is currently no universally agreed upon list of experiences that comprise ACEs. Felitti and colleagues originally coined the term “adverse childhood experiences” in their 1998 ACE Study,² an ongoing collaboration between Kaiser Permanente (San Diego, California) and CDC. Researchers in the original ACE study connected adult health outcomes to seven maltreatment and household challenge related childhood experiences. Maltreatment experiences included psychological abuse, physical abuse, and sexual abuse. Household challenges included exposure to substance abuse in the home, mental illness in the home, intimate partner violence (IPV), and criminal behavior in the home. Later ACE Study projects expanded this list of adversities to include parental divorce or separation,^{12,13} and physical and emotional neglect.¹⁴ This list of 10 adversities is known as the “original ACEs scale.”

Various models have since expanded the original scale's definition of ACEs with additional challenges to capture more diverse population exposures. The added challenges are those judged to be important in predicting short- and long-term health and well-being outcomes. For example, growing up in poverty or economic disadvantage has been associated with increased risk for lower financial earnings in adulthood, negative physical and mental health outcomes, and mortality compared to those with higher socioeconomic circumstances during childhood.^{15–19} In addition, exposure to adverse events outside of the home (e.g., in the community or at school) during childhood has been linked with childhood distress.^{20–22} Therefore, recent models of expanded ACE questionnaires have included measures of community violence exposure (e.g., witnessing or experiencing physical violence, experiencing a riot, being in a war zone), peer victimization/bullying (e.g., physical or emotional victimization by a non-sibling peer), and economic hardships (e.g., parent lost their job, low

socioeconomic status, parents struggling to meet ends).²¹⁻²⁴ Modern ACE definitions have also included experiences related to culture, environment, or systemic issues, such as discrimination, forced marriage, or early military conscription.^{24,25} Thus, ACE definitions often differ between ACE assessment tools depending upon the population being served or surveyed, the priorities of the tool's creator(s), and the outcomes of interest.

There are multiple approaches to measuring ACEs and their associations with other variables. The individual risk approach examines ACEs separately as unique indicators of risk or outcomes. This approach can be fruitful if one is interested in discovering the prevalence of a particular adversity within a population or in teasing out relationships between single ACE types and variables of interest. For example, one can examine associations between individual ACEs and mental health outcomes.^{26,27} However, there is strong evidence that ACEs tend to be interrelated rather than occurring independently, meaning that children who have been exposed to one ACE are likely to have experienced others.^{28,29} Examining ACEs solely through the individual risk approach, therefore, may lead to an overestimation of associations between individual ACEs and health outcomes.

This limitation is addressed by the cumulative scoring measurement approach, which adds up the number of ACEs to which a person has been exposed to create an ACE score.² For example, if a child had experienced physical abuse and witnessed IPV within their home, their cumulative ACE score would be two. With this type of measurement method, one can examine dose-response effects of ACEs on risk for negative health events (i.e., the impact of the accumulation of adversities, regardless of which adversities make up the score).³⁰ Some drawbacks to the cumulative ACE score approach are that it assumes equal importance/impact of each adversity on outcomes, it does not inform on the mechanisms through which ACEs lead to certain outcomes, and it assumes that everyone with the same ACE score will benefit equally from the same

intervention – all of which are unlikely.^{30,31} The cumulative ACE score approach also does not factor in the child's age or developmental stage at which the ACE(s) occurred or frequencies of ACE exposures. Despite these drawbacks, this method remains popular for generally describing the cumulative effect (allostatic load) that childhood adversity has on many adult health outcomes.²⁵

A third approach to ACEs measurement is grouping experiences by theoretically defined underlying characteristics or empirically determined dimensions. One example is the Dimensional Model of Adversity and Psychopathology (DMAP),^{32,33} which differentiates between deprivation (absence of expected environmental inputs and complexity) and threat (presence of experiences that are viewed as a threat to physical integrity) dimensions of child adversity based on neuroscience literature. In this model, for instance, deprivation could be partially represented by exposure to neglect while exposure to physical abuse could reflect threat. Composite scores for each dimension are typically created for assessment and analyses. While this type of theory driven approach recognizes that different ACEs affect outcomes through different mechanisms, the process of logically grouping ACEs may be inconsistent until more is known about these mechanisms.³¹ Other proposed frameworks have statistically grouped ACEs by their degree of correlation to each other (e.g., factor analysis)³⁴ or grouped people based on the adversities they tend to report (e.g., latent class analysis).³⁵ These empirical methods allow us to understand the impact of different ACE combinations on outcomes of interest, but they are also difficult to generalize as the derived groupings are study and outcome specific.³¹ Examinations of the above measurement methods and others have highlighted advantages of each method over others in different contexts.^{30,31,36,37} However, there is still a need for nuanced ways of measuring and conceptualizing ACEs that can be easily translated to better inform prevention practice and policy.

The timing of ACE assessments and the reporting method are also important considerations for calculating and interpreting ACE prevalence. ACEs can be assessed concurrently in childhood by asking the child's parent/guardian to report the child's ACEs or by asking the adolescent directly about ACEs while they are still aged <18 years. Children could also be followed prospectively and asked to report ACEs multiple times throughout their childhood. Reporting ACEs during childhood allows for the experiences to be fresh in the child's or parents' minds. However, if children are not followed prospectively, the measurements can be age-specific rather than applicable to one's entire childhood. In addition, a parent or caregiver reporting ACEs on behalf of a child could under-report experiences due to not witnessing the experiences themselves, wanting to avoid stigmatization, or not wanting to admit involvement (e.g., parental maltreatment). ACEs can also be assessed retrospectively by asking adults (aged ≥ 18 years) to report experiences they remember having during childhood – this method is often called measurement of “adult ACEs” because it highlights the prevalence of ACEs in the current adult population. Depending upon when the individual is assessed, adult ACE assessments can be affected by memory loss or recall bias. However, they have the advantage of covering the entire childhood, with each respondent reporting on the same number of years. Within concurrent/prospective and retrospective reporting, there can be a mix of self-reported measures (i.e., surveys) and objective reports (e.g., child welfare reports of abuse and neglect) that make up one's total ACE score.

Research has shown moderate agreement between ACEs prospectively recorded throughout childhood and ACEs that are retrospectively recalled in adulthood by the same participants.³⁸ In addition, ACE measures derived from both methods have been linked with adult health outcomes.³⁸ Taken together, this information suggests that these measurement methods can complement each other, but that they also contain unique information.

Generally, due to the differences in benefits and limitations of each ACE measurement method detailed above, it is advisable to describe ACEs prevalence in a population through multiple methods and data sources.

1.2 Health Consequences

The accumulation of ACEs has been associated with increased risk of experiencing a variety of negative health and wellbeing outcomes,² including – but not limited to – chronic diseases (e.g., lung cancer, ischemic heart disease),^{39,40} health risk behaviors (e.g., alcohol abuse),^{14,41} premature mortality,⁴² and mental health issues (e.g., suicidality, depression).^{13,43,44} Research suggests that significant and/or prolonged exposure to adversity during early sensitive developmental periods can undermine the healthy and normative development of the body's stress response systems, which in turn affects biologic outcomes (e.g., brain development, immune system, metabolic regulatory controls), making people vulnerable to chronic conditions and pathologies over their lifespan.^{4,45} Intertwined with these biological pathways are coping mechanisms against stressors that are often considered adverse outcomes themselves, such as smoking, substance abuse, or engaging in high-risk sexual behaviors. In addition, exposure to ACEs can affect how one interprets and reacts to future stressful life events and the actions of others, potentially leading to emotional distress, negative beliefs about the self, and difficulty forming or maintaining positive social connections.⁴⁶ A lack of positive social support and resources to cope with life stressors can further widen health disparities among those who have experienced high levels of ACEs compared to those who have not.

Overall, higher ACE composite scores have been associated with increased risk of multiple health outcomes when pooled together.^{47,48} However, the effect sizes of associations differ greatly when outcomes are examined separately, which could indicate differing mechanisms by which effects occur based on the type of health outcome.

The consequences of ACEs do not stop with the individual who experienced them. Multiple studies have documented a relationship between birthing parent ACEs and future offspring developmental concerns, poor health outcomes, and psychological and behavioral challenges.⁴⁹⁻⁵² For example, children born to parents with a history of four or more ACEs demonstrated higher odds of emotional disturbance and worse behavioral outcomes compared to children born to parents reporting no ACEs.⁵³ In addition, children born to birthing parents who experienced elevated ACE counts are at increased risk for elevated ACEs themselves.⁵⁴ These and other studies demonstrate the continued cycle of intergenerational transmission of traumas,^{55,56} giving context to how historical trauma can affect future generations.

It is important to note that the risks highlighted above are population-based, meaning it would be problematic to convey the same level of increased risk onto an individual with a certain number of ACEs.⁵⁷ Further, the above research is probabilistic rather than deterministic.⁵⁸ In other words, ACEs put individuals at increased risk for adverse health consequences, but there will always be person-to-person variation in outcomes.

National comparisons are limited, however a recent report⁵⁹ noted that Alaska adults in 2013 reported higher prevalence of adverse childhood experiences (both individual ACEs and composite ACE scores) compared to prevalence estimates observed in a 2009 combined five-state CDC study⁶⁰ using the same data source. Childhood trauma has contributed in varying degrees to numerous poor health outcomes in Alaska. For example, it is estimated that 32% of adult current smokers in Alaska would not be smoking if they didn't have ACEs.⁵⁹ In addition, Alaska adults with four or more ACEs were roughly 250% less likely to have graduated from high school than those with zero ACEs,⁵⁹ limiting job and subsequent economic growth opportunities. Historical traumas influencing the relationships between ACEs and health outcomes across generations are especially salient within Alaska's diverse populations and

history. For example, Alaskans have experienced homeland displacement, loss of culture, racism, and devastating outbreaks of diseases that have killed entire communities (e.g., 1918 Spanish flu outbreak) or enhanced already existing health disparities (e.g., COVID-19 pandemic).

1.3 Aims

The aims of this review are to describe the epidemiology of ACEs in Alaska using multiple sources by: (1) presenting prevalence of ACEs in Alaska overall and by subgroups, (2) describing ACEs trends, and (3) reviewing Alaska's ACE prevention infrastructure in accordance with prevention recommendations.

2.0 Methods

Data were obtained from multiple surveillance systems and databases to provide a comprehensive overview of the prevalence of ACEs in Alaska. Specific information from each data source is described below, including available years, weighting processes, and variables used to calculate ACE scores. Variables used to calculate ACE scores were kept consistent across time within each data source to facilitate trending. Table 1 summarizes ACE elements measured by each population source.

Weighted percentages are used to describe prevalence of ACE scores and individual components. Prevalence of ACE scores are presented overall and stratified by demographics available from each data source. Demographics included sex, race, public health region of residence,⁶¹ and financial indicators (i.e., Medicaid status, Alaska federal poverty guideline status).⁶² Race determinations are unique to each data source and are described within each source's description below. ACE score trends are also presented. Unless specifically noted, all comparison or trend descriptions are based on absolute value comparisons and may not reflect statistically significant outcomes. Therefore, use caution when interpreting differences or drawing conclusions about changes over time. When available, the 95% confidence intervals for survey data are presented in

the text, bar figures, and tables. All analyses were conducted using R version 4.0.5 (R Core Team, 2021).

2.1 Alaska Longitudinal Child Abuse and Neglect Linkage Project

The Alaska Longitudinal Child Abuse and Neglect Linkage Project (ALCANLink)⁶³ is a mixed-design, population-based database that leverages existing epidemiological and administrative data resources to examine incidence of child maltreatment and related outcomes in Alaska. It annually links Pregnancy Risk Assessment Monitoring System (PRAMS) respondent information with administrative data. Alaska PRAMS surveys a population-based sample of people delivering live births in Alaska who are 2–6 months post-partum about pre-pregnancy, pregnancy, and postpartum experiences. Alaska Native mothers and low birthweight (<2,500 grams) births are oversampled, and data are weighted to represent all births in Alaska during the calendar year of interest.^{64,65}

At the time of the current report's publication, ALCANLink had combined responses from the 2009–2018 PRAMS birth cohorts with Alaska administrative data through 2021. PRAMS data were collected by the Section of Women's, Children's, & Family Health's (WCFH) Alaska PRAMS project in three separate phases (2009–2011, 2012–2015, 2016–2022), with survey questions modified for each phase. Copies of the surveys can be found on the PRAMS website (<https://health.alaska.gov/dph/wcfh/Pages/mcheipi/prams/default.aspx>). Linked administrative data sources were child protective services records from the Office of Children's Services (OCS), birth and death certificate records, and Alaska Permanent Fund Dividend (PFD) records. OCS records included all alleged child (aged <18 years) physical abuse, sexual abuse, mental injury (psychological/emotional abuse), and neglect reports, investigations, and findings. Birth and death certificate records provided birthing parent demographics at the time of the child's birth and identified any deaths among the linked cohort. The

PFD database contained information from all Alaska residents who apply for a dividend (<https://pfd.alaska.gov>) and was used to determine in-state presence. Individuals who died or moved out of state, as informed by the linked administrative data, were censored at the time of loss to follow-up.

ALCANLink also integrates data from the Childhood Understanding Behaviors Survey (CUBS), a 3-year follow-up to PRAMS. CUBS surveys PRAMS respondents still living in Alaska about environmental, social, and other experiences affecting them or their child. CUBS data are weighted using the PRAMS weighting framework, restructured with updated birth records to adjust the original sampling weight and coverage components; the nonresponse component is revised to accommodate CUBS survey non-response. At the time of this publication, 2012–2020 CUBS respondent data were available for analysis. These data were collected by WCFH's Alaska CUBS project in three separate phases (2012–2014, 2015–2019, and 2020–present), with survey questions modified for each phase. Copies of the surveys can be found on the CUBS website (<https://health.alaska.gov/dph/wcfh/pages/mcheipi/cubs/>).

For demographic stratification, race of the child was determined by the birthing parent's race indicated on the child's birth certificate. If multi-racial, race was coded using the following hierarchical method: if Alaska Native/American Indian (AN/AI) was one of the identified races, then coded as AN/AI; else if Pacific Islander was one of the identified races, then coded as Pacific Islander; else if Black was one of the identified races, then coded as Black; else if Asian was one of the identified races, then coded as Asian; else if White was one of the identified races, then coded as White.

Analyses for the current study were limited to the linked data of those who responded to both the PRAMS and CUBS surveys (birth years 2009–2017, n = 4,990, representing about 96,792 3-year-old children born in Alaska).

2.1.1 ALCANLink ACE Components

Reported maltreatment to OCS and birthing parent self-reported early childhood household challenges (CUBS) exposures (13 total) were summed to calculate composite ACE scores. Missing responses were treated as non-exposure for the composite score and were excluded from individual prevalence estimates. If all variable components were missing, the participant was excluded from the analyses. Individual ACE components' prevalence are presented across the nine years of available data. Trends were assessed for each ACE composite score using Logistic regression with a quasi-binomial link by creating bi-variate variables for each score (e.g., 0 ACEs – yes, no; 1 ACE – yes, no; etc.) and regressing each score by year.

Maltreatment ACE components included first reports to OCS of alleged physical abuse, sexual abuse, mental injury, and neglect prior to age 4. First allegations, opposed to substantiations, were used because prior research demonstrates that persons who experience unsubstantiated reports have similar outcomes as those who experience substantiated reports regarding child protective services system recidivism, school performance and delinquency, and behavioral or developmental outcomes.^{66–68}

The 2012–2020 CUBS data were used to identify household challenges experienced by the birthing parent during the child's early childhood (birth to age 3 years). Variables were chosen based on best alignment with previous ACEs literature and frameworks^{2,12,21} and consistent representation across CUBS survey versions. Household challenges included financial hardship, homelessness, intimate partner violence, mental illness or substance abuse in the household, parental divorce or separation, parental incarceration, parental job loss, substance abuse by someone close to the birthing parent, and witnessing household violence (Table 2).

2.2 National Survey of Children's Health

The National Survey of Children's Health (NSCH) is a national survey funded and directed by the Health Resources and Services Administration's Maternal

and Child Health Bureau (HRSA MCHB).⁶⁹ Households are randomly sampled and contacted to identify those with children aged <18 years. If multiple children are living in a household, one is randomly selected to be the subject of the survey. An adult in the household who is familiar with the selected child's health and health care then answers questions regarding the child's health and wellbeing. Question topics include the child's physical and mental health, access to and quality of health care, and the child's family, neighborhood, school, and social context.

The original version of the survey was conducted three times between 2003 and 2012 before being revised in 2016. Since 2016, the NSCH has been fielded annually by the U.S. Census Bureau. Children with special health care needs and children aged 0–5 years are oversampled, and data are weighted to represent the population of non-institutionalized children aged 0–17 years who live in housing units nationally and in each state.⁷⁰

Race was self-reported and coded as the following: White alone, Black or African American alone, AN/AI alone, Asian alone, Native Hawaiian and other Pacific Islander alone, and two or more races.

The current analysis used publicly available NSCH data for Alaska from 2016–2021 to calculate ACEs prevalence among children aged 0–17 years. (<https://www.census.gov/programs-surveys/nsch/data/datasets.html>).

2.2.1 NSCH ACE Components

The following eight 2016–2021 variables were used to calculate composite ACE scores (Table 3): intimate partner violence, financial hardship, mental illness in the household, neighborhood violence, parental death, parental divorce or separation, parental incarceration, and substance abuse in the household. NSCH does not collect maltreatment variables, and therefore, maltreatment was not included as an ACE component. Missing responses were treated as non-exposure for the composite score and were excluded from individual prevalence

estimates. If all variable components were missing, the participant was excluded from the analyses.

Prevalence rates for individual ACE components were calculated across the 6 years of available data. Prevalence of an ACE related to discrimination was also included in these individual estimates, created by combining questions regarding experiences of discrimination due to race (2016–2017 data), sexual orientation or gender (2020–2021 data), and health conditions or disability (2021 data). Discrimination was not included in the composite ACE score to ensure that each variable in the composite score had at least 3 years of data for consistency and trending purposes. In addition, not all three discrimination questions were asked together in all analyzed NSCH years.

2.3 Alaska Behavioral Risk Factor Surveillance System

The Behavioral Risk Factor Surveillance System (BRFSS) is an annual, state-based, random-digit-dial telephone survey that collects data from non-institutionalized U.S. adults regarding health conditions and risk factors.⁷¹ The core survey (AK-BRFSS) has been implemented in Alaska by the Alaska Division of Public Health (DPH) in cooperation with the CDC since 1991. Alaska residents aged 18 years and older are interviewed over the telephone, with oversampling in non-urban areas of Alaska. Data are then weighted according to CDC guidelines (see <https://health.alaska.gov/dph/Chronic/Pages/brfss/method.aspx> for an overview).

Race was self-reported by respondents and coded as follows: AN/AI (any mention), Asian (non-Hispanic), Black or African American (non-Hispanic), Hispanic or Latino, Native Hawaiian or Other Pacific Islander (non-Hispanic), White (non-Hispanic), and Multiracial or Other Race.

ACE data were only collected by Alaska via optional modules during 2013–2015. A 2013–2015 AK-BRFSS dataset was requested via a data use agreement and queried to calculate the prevalence of

adult ACEs reported in Alaska. During the 3-year period, 12,623 Alaska residents were interviewed (11,296 individuals answered ACE questions, representing 1,444,184 adults).

2.3.1 AK-BRFSS ACE Components

Self-reported exposures to eight maltreatment and household or community challenges before the age of 18 years were summed to calculate composite ACE scores (Table 4). Missing responses were treated as non-exposure for the composite score and were excluded from individual prevalence estimates. If all variable components were missing, the participant was excluded from the analyses.

Maltreatment ACE components included in the composite score were physical abuse, sexual abuse, and mental injury (emotional abuse). Household challenges included in the composite ACE score were intimate partner violence, mental illness in the household, parental divorce or separation, parental incarceration, and substance abuse in the household.

The prevalence of individual ACE components were calculated across the 3 years of available data. Included in these rates were emotional neglect and physical neglect, both collected only during the 2014–2015 AK-BRFSS surveys. Emotional and physical neglect were not included in the composite ACE score to ensure that each variable in the composite score had at least 3 years of data for consistency and trending purposes.

2.4 Alaska Victimization Survey

The Alaska Victimization Survey (AVS) is a general population survey of randomly selected adult, non-institutionalized, English-speaking women in Alaska. The survey collects data regarding experiences with lifetime and past year intimate partner violence, sexual violence, and stalking. It is funded by the Alaska Council on Domestic Violence and Sexual Assault and implemented by the University of Alaska Anchorage Justice Center. The statewide surveys have been conducted every 5 years, beginning in 2010. Regional surveys were also conducted during 2011–2015. Overall, about 13,000

women in Alaska have been surveyed through the AVS at the time of this publication. Cases were weighted to match their relative prevalence in the general adult Alaska female population (see <https://scholarworks.alaska.edu/handle/11122/7782> for publications featuring year specific results and weighting information).

Race was self-reported and coded as follows: Alaska Native/American Indian alone, White alone, other race alone (includes Black and African American, Asian, Native Hawaiian or Other Pacific Islander), and two or more races.

ACE data was only collected on the 2020 AVS survey. Therefore, only 2020 AVS data were requested and used in the current report ($n = 2,100$, representing about 265,572 adult women in Alaska).

2.4.1 AVS ACE Components

Self-reported maltreatment and household challenges exposures before age 18 years were summed to calculate composite ACE scores (Table 5). Missing responses were treated as non-exposure for the composite score and were excluded from individual prevalence estimates. If all variable components were missing, the participant was excluded from the analyses. Prevalence rates for individual ACE components in 2020 were calculated.

Maltreatment ACE components included in the composite ACE score and individual ACE prevalence analyses were physical abuse, sexual abuse, and mental injury. Household challenges included in the composite ACE score and individual ACE prevalence analyses were intimate partner violence in the home, mental illness/suicidality in the home, parental divorce or separation, household member incarceration, and substance abuse in the household.

3.0 Results

3.1 Early Childhood (0–3 Years)

The ALCANLink ACE score was comprised of 13 elements (9 household challenges, 4 maltreatment).

Figure 1 presents early childhood ACE score prevalence over a 9-year period from 2012–2020. Across all years combined, ALCANLink estimates that 47% (95% Confidence Interval (CI): 46%, 49%) of 3-year-old children in Alaska experienced at least one ACE, and 9% (95% CI: 8%, 10%) experienced four or more.

The percentage of 3-year-old children who did not experience any ACEs ranged from a high of 58% (95% CI: 52%, 63%) in 2019 to a low of 47% (95% CI: 42%, 53%) in 2012. Prevalence for successive ACE counts were as follows: 20% (95% CI: 18%, 21%) of 3-year-olds experienced one ACE, 11% (95% CI: 10%, 13%) experienced two ACEs, 7% (95% CI: 6%, 8%) experienced three ACEs, and 9% (95% CI: 8%, 10%) had four or more ACEs.

The individual trends for one to four or more ACEs among 3-year-old children each remained flat over time ($p > 0.10$ for each ACE group trend). However, prevalence for zero ACEs among 3-year-old children trended slightly upward over the 9-year period ($\beta = 0.03$, $p = 0.02$).

Table 6 presents ACE score prevalence within demographic groups of Alaska children aged 3 years. From 2012–2020, an average of 47% (95% CI: 45%, 50%) of male children and 48% (95% CI: 45%, 50%) of female children experienced at least one ACE, and the distribution of ACE scores was similar between the two sexes. Over half of children within all identified racial groups except for Asian and White experienced at least one ACE across the 9-year period (Alaska Native/American Indian children: 66% (95% CI: 63%, 68%), Asian children: 41% (95% CI: 34%, 49%), Black children: 57% (95% CI: 43%, 69%), Pacific Islander children: 64% (95% CI: 44%, 80%), White children: 40% (95% CI: 37%, 42%)). Distribution of ACEs tended to cluster around 0–1 ACEs for all racial groups, except for Black and Alaska Native children, who had the highest (20% [95% CI: 11%, 35%]) and second highest (17% [95% CI: 16%, 19%]) prevalence of four or more ACEs, respectively.

On average during 2012–2020, young children whose family resided in the Northern public health region at birth had the highest percentage of four or more ACEs (15%; 95% CI: 11%, 19%), followed by children residing in the Southwest and Southeast regions. Children residing in the Anchorage, Gulf Coast, Interior, and Matanuska-Susitna regions had the lowest percentage of four or more ACEs (all at 8%). Finally, 15% (95% CI: 13%, 17%) of 3-year-old children enrolled in Medicaid at the time of birth had an ACE score of four or more compared to only 3% (95% CI: 2%, 4%) of those not enrolled in Medicaid.

3.1.1 Individual ACEs

Among the 13 elements measured by ALCANLink the most common ACE experienced by 3-year-old children in Alaska was financial hardship (23%; 95% CI: 22%, 25%), marked by parents reporting being unable to pay bills (Figure 2). Relatedly, 19% (95% CI: 18%, 21%) of children had a parent lose employment during the child’s early childhood. The least common early childhood ACE was sexual abuse, with roughly 2% (95% CI: 1%, 2%) of children who experienced an alleged sexual abuse report to OCS.

3.2 Childhood (0–17 Years)

Using the publicly available NSCH data from 2016–2021, we constructed an ACE score using 8 elements (all household or community challenges). Approximately 41% (95% CI: 39%, 44%) of children aged ≤ 17 years in Alaska have experienced at least one ACE during their childhood, consistent with national NSCH estimatesⁱ of 40% (95% CI: 39%, 40%). Overall, among children aged ≤ 17 years in Alaska, 58% (95% CI: 56%, 61%) did not experience any ACEs, 19% (95% CI: 18%, 21%) had one ACE, 9% (95% CI: 8%, 11%) had two ACEs, 5% (95% CI: 4%, 6%) had three ACEs, and 8% (95% CI: 6%, 9%) experienced four or more ACEs (Figure 3).

According to NSCH trend estimates, prevalence of zero ACEs increased over the 6-year period for children aged ≤ 17 years in Alaska, ranging from a low of 55% (95% CI: 49%, 61%) in 2017 to a high of 64% (95% CI: 59%, 69%) in 2020 (Figure 3). They then dipped slightly back down in 2021. Mirroring the 2020 high for zero ACEs, prevalence for four or more ACEs declined from a high point of 9% (95% CI: 7%, 13%) in 2019 to its lowest point of 6% (95% CI: 3%, 9%) in 2020. Prevalence of one ACE declined slightly over the period, with a high of 21% (95% CI: 17%, 26%) in 2016 and low of 17% in 2021 (95% CI: 14%, 22%). Prevalence for other ACE composite scores fluctuated throughout the measured period but appeared to have overall flat trends.

Table 7 presents ACE score prevalence within demographic characteristics of Alaska children aged ≤ 17 years. ACE score distribution was similar between the two identified sexes, with a majority children (58% of Males, and 59% of females) reporting zero ACEs. Alaska Native/American Indian children had the highest proportion of four or more ACEs (18%) while Asian children had the lowest percentage of four or more ACEs (1%) There was an unequal distribution of ACE scores between children with different Medicaid or other government assistance enrollment statuses at the time of the NSCH survey. A high percentage (72%) of children not enrolled in Medicaid or other government program had zero ACEs compared to children enrolled (37%). In addition, 16% of children enrolled in a government assistance program had an ACE score of four or more compared to only 3% of those not enrolled.

3.2.1 Individual ACEs

During 2016–2021, among the 8 elements measured on the NSCH survey, the most common ACE experienced by children aged ≤ 17 years in Alaska was parental divorce (25%; 95% CI: 23%, 27%)

ⁱ National estimates for the years 2016–2021 were calculated internally using publicly available files from <https://www.census.gov/programs-surveys/nsch/data/datasets.html> (last accessed 9/20/2023)

(Figure 4). The least common reported ACE was death of a parent or guardian (4%; 95% CI: 3%, 5%).

3.3 Adult ACEs

The AK-BRFSS ACE score was comprised of 8 elements (5 household challenges, 3 maltreatment). Figure 5 presents prevalence of adult ACEs in Alaska during 2013–2015. According to AK-BRFSS estimates, 32% (95% CI: 30%, 33%) of adults retrospectively reported experiencing zero ACEs, 23% (95% CI: 22%, 24%) reported one ACE, 15% (95% CI: 14%, 16%) reporting two ACEs, 11% (95% CI: 10%, 11%) reported three ACEs, and 20% (95% CI: 19%, 22%) reported four or more ACEs. Overall, 68% of adults in Alaska retrospectively reported experiencing at least one ACE. This prevalence rate is higher than the 2015–2017 national BRFSS estimate, which reported 60.9% of adults in the 25-state study population experienced at least one ACE.⁷

Overall ACE trends remained relatively consistent, with slight variations in the zero and one ACE composite score prevalence rates in 2014. Specifically, the prevalence of zero adult ACEs dipped slightly in 2014 (30%; 95% CI: 29%, 33%), and the percentage of adults reporting one ACE rose (24%; 95% CI: 22%, 26%), compared to other years (Figure 5).

Table 8 presents ACE score prevalence within demographic characteristics of Alaska adults. A slightly higher percentage of females (24%; 95% CI: 22%, 25%) reported experiencing four or more ACEs during childhood than males (17%; 95% CI: 16%, 19%). Alaska Native/American Indian (30%; 95% CI: 27%, 34%) and multiracial or other race adults (30%; 95% CI: 16%, 48%) reported the highest percentages of four or more adult ACEs, followed closely by adults who ethnically identified as Hispanic or Latino (27%; 95% CI: 19%, 35%). Asian adults reported the lowest percentage of four or more ACEs (11%; 95% CI: 6%, 19%). Distribution of adult ACEs were relatively similar across public health regions. Finally, a slightly higher percentage of Alaska adults living below the 100% federal

poverty guideline (FPG) experienced four or more ACEs (29%, 95% CI: 24%, 33%) than those who were not below the FPG (20%, 95% CI: 18%, 21%).

3.3.1 Individual ACEs

During 2013–2015, among the 8 elements measured on the Alaska BRFSS survey, the most frequently reported ACE experienced before age 18 years in Alaska was mental injury (39%; 95% CI: 38%, 41%), closely followed by substance abuse in the household (34%, 95% CI: 33%, 35%) (Figure 6). The ACE experienced the least often was incarceration of someone in the household (11%; 95% CI: 10%, 12%).

3.4 Adult Women ACEs

The AVS ACE score was comprised of 8 elements (5 household challenges, 3 maltreatment). According to AVS estimates, 21% (95% CI: 18%, 23%) of adult women retrospectively reported experiencing zero ACEs, 17% (95% CI: 15%, 19%) reported one ACE, 14% (95% CI: 12%, 17%) reporting two ACEs, 14% (95% CI: 12%, 16%) reported three ACEs, and 34% (95% CI: 31%, 37%) reported four or more ACEs in 2020. Overall, around 79% of adult women in Alaska retrospectively reported experiencing at least one ACE.

Table 9 presents ACE score prevalence within two demographic characteristics of Alaska adult women (race and financial stress in adulthood). Adult women who identified as two or more races had the highest percentage of four or more adult ACEs (55%; 95% CI: 46%, 64%) and the distribution of total ACEs was heavily skewed toward higher ACE counts. Notably, 88% of those who identified as two or more races reported Alaska Native/American Indian as one of the races. Alaska Native/American Indian alone women had the second highest percentage of four or more adult ACEs (43%; 95% CI: 33%, 54%), followed by White women (31%; 95% CI: 28%, 34%) and women who identified as any other single race (27%; 95% CI: 18%, 39%). Finally, a higher percentage of women who experienced financial stress during adulthood reported experiencing four or more ACEs (42%;

95% CI: 38%, 46%) than those who did not experience financial stress (22%; 95% CI: 19%, 26).

3.4.1 Individual ACEs

Among the 8 elements measured on the AVS, the most experienced adult ACE in Alaska for women who were surveyed in 2020 was mental injury (55%; 95% CI: 52%, 58%), followed by substance abuse in the home (43%; 95% CI: 40%, 46%) (Figure 7). The least experienced adult ACE for women was incarceration (11%; 95% CI: 9%, 13%).

4.0 Prevention

ACEs are complex, but they are preventable. According to the CDC,⁷² creating and maintaining safe, stable, nurturing relationships and environments for children and families can prevent ACEs and help children reach their full health and life potential. Fostering such environments requires both addressing societal conditions that lead to impaired family functioning and offering interventions that support positive ways of dealing with adversity within the family context.⁷³ Early prevention efforts are particularly important because household challenges experienced by birthing parents during the pre-birth period have been shown to drive elevated ACEs scores in their young children.⁷⁴ Accordingly, interventions beginning during pregnancy for prenatal stress and consequences of parental ACEs (e.g., PTSD) may establish a foundation of protective capacities for the family and future child.⁷⁵ Equally important is ACE harm mitigation, which can include building skills and ensuring access to resources and environments that promote protective processes in the face of early adversity.^{76,77} For example, individuals with ACE histories who recall substantial positive childhood experiences and relationships, compared to those without such positive experiences, have more positive long-term functioning and their children show less exposure to traumatic events.^{78,79}

In 2019, the CDC released a suite of technical packages

<https://www.cdc.gov/violenceprevention/communicationresources/pub/technical-packages.html>;

accessed 12/30/2022) that highlight six main strategies to prevent ACEs and mitigate their harms. These prevention strategies are described below, along with Alaska-specific programs available at the time of publication that address them.

4.1 Strengthen Economic Supports to Families

The first CDC ACEs prevention strategy is to strengthen economic supports to families, mainly through strengthening household financial security and creating family-friendly work policies.⁷² Financial security can be strengthened by ensuring those who desire to work are able to, offering livable wages, and connecting families to financial assistance (e.g., childcare subsidies, tax credits) when needed. The Alaska Department of Labor and Workforce Development's Division of Employment and Training Services (DETS) offers several employment and training services to advance opportunities for employment and economic stability for Alaskans, including education and English literacy services and maintaining statewide job centers to assist job seekers with employment related services. In addition, the Division of Public Assistance from the Alaska Department of Health (DOH) aids with childcare expenses through the Parents Achieving Self Sufficiency (PASS) and the Alaska Inclusive Child Care (Alaska IN!) programs. These resources, along with family-friendly work policies (e.g., paid leave, flexible and consistent work schedules), can increase economic stability for families. Individuals' subsequent improved abilities to meet their families' basic needs and obtain high-quality childcare reduces stress and helps enable stable and nurturing environments.

4.2 Promote Social Norms that Protect Against Violence and Adversity

A key strategy in ACE prevention is changing group-level beliefs that allow indifference to violence and adversity to instead promote community norms around shared responsibility for the health and well-being of all children.⁷² Public education campaigns can reframe the way people think and talk about ACEs, shifting the narrative from individual responsibility to one that engages the community in

promoting protective factors and reducing stigma around seeking help.^{80,81} Examples of such campaigns include the Alaska Children's Trust's (ACT) training and educational programs, particularly History & Hope and Healthy Outcomes from Positive Experiences (HOPE; <https://www.alaskachildrenstrust.org/aces-initiative>). History & Hope offers community training that outlines the impact of ACEs across the lifespan and introduces how trauma-informed approaches can help shift health and social problems. Similarly, HOPE introduces Alaskans to the benefits of positive childhood experiences (PCEs) and initiates conversations with audiences on how communities and systems of care can ensure equitable access to PCEs and support families' strengths.

Additional actions toward this strategy include bystander approaches and efforts to mobilize men and boys as allies in prevention. These actions foster healthy norms around gender, masculinity, and violence, and they teach individuals to safely intervene against risky behavior. Alaska's Council on Domestic Violence & Sexual Assault (CDVSA) connects Alaskans with several prevention partners that address this strategy, including: (1) Alaska Network on Domestic Violence & Sexual Assault (ANDVSA), which has programs such as Alaska Men Choose Respect, COMPASS – A Guide for Men, and Stand Up Speak Up (SUSU) that empower youth and men to actively prevent violence and promote respect in their communities; and (2) Coaching Boys Into Men (CBIM), which is a comprehensive violence prevention curriculum for coaches and their athletes.

4.3 Ensure a Strong Start for Children

For many reasons, parents may find it difficult to provide the care and nurturing needed to support healthy child development so that children can reach their full capacities. Early childhood home visitation and high-quality childcare/preschool enrichment programs with family engagement assist with these challenges by helping to ensure supportive home environments and strong foundations for children's

future learning and opportunities. In Alaska, there are several early childhood programs dedicated to supporting families in providing children with the best possible start while involving and educating parents in the process. The Alaska Early Intervention/Infant Learning Program (EI/ILP) within the DOH assures that early intervention services are available for families with infants and toddlers (birth to 3 years of age) with special needs, including developmental screening, individualized family plans, home visits, therapy, and referrals to other needed services. Another important program is Help Me Grow® Alaska run by the All Alaska Pediatric Partnership (A2P2). Help Me Grow Alaska is a free program that promotes healthy child development statewide by providing support and information to individuals and organizations who care for children and young adults (prenatal to 26 years of age). Staff in the program are experts in child development, social services, and resources available in Alaska, and they connect families to the most available and appropriate services in their own community. Beyond these programs, Alaska also has local adaptations of other evidence-based national programs such as Head Start, Early Head Start, and Parents as Teachers. Taking advantage of what these programs have to offer can prevent ACEs by helping to educate parents on child development, easing certain burdens of childcare, and strengthening connections between home and school environments.

4.4 Teach Children Necessary Skills

The fourth CDC-recommended ACEs prevention strategy is to teach children and youth skills to handle stress, resolve conflicts, and manage their emotions/behaviors.⁷² Managing one's thoughts and feelings to enable goal-directed actions is known as self-regulation.⁸² Self-regulation is a set of skills and processes that serve as a foundation of lifelong functioning across a range of domains, such as mental and physical health and academic achievement.^{83,84} While biological predisposition sets the stage for self-regulation development, children continue to develop and hone these skills through co-regulation with trusted caregivers.⁸² Co-

regulation involves warm and responsive interactions between children and caregiving adults in which support, coaching, and modeling is provided to assist the child's ability to manage their thoughts, feelings, and behaviors.⁸² These interactions can occur at home, in school, and during outings in the wider community.

One key method to teach these recommended skills is through the social emotional learning (SEL) approach. According to the Association of Alaska School Boards (AASB), SEL is a comprehensive systems approach which supports children, youth, and adults in developing the aforementioned skills for school and life.⁸⁵ The AASB collaborated with the Alaska Department of Education & Early Development (DEED), community members, and other formal entities to develop Transforming Schools, a framework for trauma-engaged practice in Alaska

(<https://education.alaska.gov/apps/traumawebtoolkit/new-framework-page.html>).^{86,87} Part of the comprehensive Transforming Schools framework includes skill instruction, which provides resources and instruction to school staff and leadership on how to support an SEL system approach.

Another key approach for this prevention strategy is through safe dating and healthy relationship skill programs. In Alaska, there are at least two highlighted programs that use this approach: (1) The Fourth R, a relationship-based curriculum for grades 7–9 to promote healthy relationships and reduce interpersonal violence, dating violence, and other adolescent risk behaviors; and (2) Talk Now, Talk Often, a campaign to help Alaskan parents and caregivers increase healthy relationship conversations with teens. The Alaska Safe Children's Act requires schools to develop educational programs related to healthy relationships and sexual assault awareness and prevention. The Fourth R is one way that school in Alaska can meet that requirement. Finally, several Alaskan organizations (e.g., A2P2, ACT) promote parenting skills and family relationship approaches, which cover developmentally appropriate expectations for

child behavior and work with parents to support effective parent-child communication and relationships. Engaging Alaskans in the above programs can teach children and youth necessary emotional management skills and help parents strengthen these skills within themselves and their children, helping to prevent ACEs.

4.5 Connect Youth to Caring Adults and Activities

Connecting youth to caring adults and activities establishes positive networks and experiences for youths.⁷² As previously mentioned, these relationships also support further self-regulation development through youth-adult co-regulation opportunities. This prevention strategy can take the form of mentoring programs, which pair youth with an adult volunteer to foster relationships that contribute to the youth's growth and skill development. One such example is the Alaska arm of the national program Big Brothers, Big Sisters. An evaluation of Big Brothers, Big Sisters showed that youth participants were less likely to start using illegal drugs or alcohol, use violence, or skip school than youths who did not partake in the program.⁸⁸ In addition, successful Big Brothers, Big Sisters mentor relationships carried over to the youths' other relationships. Youths in the program also experienced improved parental trust, higher emotional peer support, and higher confidence in their own academic abilities compared to non-program youth. These benefits, and others resulting from mentorship or after-school programs, offer important buffers against the impact of parental absence, difficulties at home, and exposure to negative influences within the community.

4.6 Intervene to Lessen Immediate and Long-Term Harms

Timely access to assessment, intervention, support, and treatment for children and families following ACEs can help mitigate the behavioral and/or health consequences of ACEs and break the cycle of adversity. The Plans of Safe Care (POSC) program,⁸⁹ which was piloted as Hello B.A.B.Y. (Building Alaska's Babies With You) in 2021 at Bartlett

Hospital in Juneau, speaks to this CDC strategy. The program helps minimize adverse outcomes of infants born substance-exposed by having a POSC specialist or prenatal care staff member develop a care plan in collaboration with the families to ensure the safety and wellbeing of the substance-exposed newborn. Families can receive information about their concerns (e.g., baby, caregiver, health, or other needs) and get connected to services, including supports from community-based agencies such as the infant’s primary care provider, treatment programs, ILP, home visiting programs, and WIC. In addition, starting in 2023, Harm Reduction diaper bags with prenatal vitamins, water bottles, prenatal books, and resource information will be provided to all perinatal patients in the emergency department with the goal of destigmatizing substance use and encouraging more prenatal care prior to delivery.

The Alaska Child Trauma Center at the Alaska Division of Behavioral Health (DBH), and DBH as a whole, are committed to advancing effective treatment efforts following ACE exposure(s). These efforts include providing trauma-informed training opportunities for providers, caregivers, and community members. For example, they sponsor Trauma 101 trainings across Alaska, which focus on understanding impacts of trauma such as ACEs and ways to support recovery and resiliency. In addition, the two agencies host the annual Alaska Advanced Trauma Training Institute. This conference aims to better equip Alaska behavioral health and social service providers through sharing data-driven advances in trauma-informed systems and clinical interventions. Further training opportunities and clinical services offered by the Alaska Child Trauma Center and DBH can be found here: <https://alaskabehavioralhealth.org/alaska-child-trauma-center-at-acmhs/>.

Enhanced primary care and service connection systems may also be used to identify and address ACE exposures. In 2016, A2P2 contracted with Strengthening Families™ Alaska (described in section 4.7) to develop a Toolkit⁹⁰ for primary care providers that offers shortened training on the

framework and provides practical tips and resources for integrating the framework’s protective factors into the providers’ practice. In addition, Alaskans can take advantage of Alaska 2-1-1, a phone-based system that connects individuals with a wide variety of services in their community, including emergency food and shelter, educational opportunities, alcohol and drug treatment programs, and childcare. Such efforts not only mitigate harms from existing ACE exposures, but also help prevent future ACEs within families and the next generation.

4.7 Additional Alaska Programs and Frameworks

Strengthening Families™ Alaska (SFA) is a national program that is locally coordinated by OCS within in the Alaska Department of Family and Community Services (DFCS). It is a research-informed, strength-based approach to helping families address risk factors and promote healthy development, with an overarching goal of child and family well-being promotion. The framework has been implemented by OCS in Alaska since 2005 to help prevent child abuse and neglect. It engages families, programs, and communities in building parental resilience, social connections, knowledge of parenting and child development, concrete support in times of need, and social and emotional competence of children – all major protective factors within the CDC’s published ACEs prevention strategies. A series of free SFA learning and training opportunities are currently offered by the University of Alaska Anchorage Child Welfare Academy for child protection workers and others involved in child welfare, along with resources for parents and communities.

The Alaska Native Tribal Health Consortium (ANTHC) is a non-profit Tribal health organization designed to meet the unique health needs of Alaska Native/American Indian people living in Alaska. ANTHC offers, among other things, comprehensive health and wellness programs for Alaska Native people and their families, including prevention against individual ACE components such domestic and sexual violence, substance misuse, and suicide. In addition, ANTHC offers trainings to tribal health

organizations and local communities centered on understanding ACEs and building self-healing communities. The organization's ultimate mission is to optimize Alaska Native people's health and well-being through collaborative partnerships and services, which allows them to take a multi-tiered, lifespan approach to ACE prevention and intervention within the unique cultural communities they serve. In addition to ANTHC, many Tribal health organizations across the state are each applying trauma-informed comprehensive health and wellness programs. One example is the Southcentral Foundation, which administers the home visiting program Nutaqsiivik to eligible mothers. The foundation also has a New Generations program that approaches well-being by addressing social determinates of health, including ACEs, across the life course. Finally, their Family Wellness Warriors program works to equip organizations and individuals to effectively address the spiritual, emotional, mental, and physical effects of domestic violence, abuse, and neglect in the Alaska Native community.

Another important player in ACE prevention within Alaska is the Alaska Mental Health Trust Authority (Trust). The Trust is a state corporation that administers a perpetual trust to improve the lives of beneficiaries and ensure that Alaska has a comprehensive integrated mental health program. The Trust works with various partner boards to work toward these aims, including the Alaska Mental Health Board (AMHB), the Advisory Board on Alcoholism and Drug Abuse (ABADA), and the Statewide Suicide Prevention Council (SSPC). Beneficiaries of the Trust include Alaskans with mental illness, developmental disabilities, chronic alcohol or drug addiction, Alzheimer's disease and related dementia, and traumatic brain injuries. The Trust also works in prevention and early intervention services for individuals at risk of becoming beneficiaries, including children in at-risk homes or environments. The Trust's beneficiaries encompass ACE holders and those who are at risk for ACEs, leading the entity to help fund many support, treatment, prevention, and intervention services,

including some of the programs mentioned above. In fact, a major part of the Trust's 2020–2024 Integrated Mental Health Program Plan is to fund and promote early childhood intervention and prevention programs,⁹¹ recognizing that targeted prevention occurring before birth and throughout childhood is needed to reduce the risk for and impact of negative childhood events. Overall, the presence of the Trust and the many programs listed above ensure that Alaska has a solid infrastructure in place for ACE prevention and harm mitigation.

Evaluating which programs (or potential programs) might be best for certain populations and ACE components over time is critical for implementing a public health approach to ACE prevention. One such approach would be to apply the Haddon Matrix framework^{92,93} with Runyan's⁹⁴ third dimension addition to ACE prevention under a public health model. This approach allows multiple interventions and prevention strategies to operate across settings, timeframes, and in the context of diverse social structures. For ACE prevention, the Haddon Matrix pre-event phase should be split amongst the pre-birth and childhood periods when considering efforts targeted at the host, physical, and social environments. In short, using this tool would be useful in establishing and evaluating primary, secondary, and tertiary ACE prevention activities. It can also spark connections between programs, facilitating warm hand-offs as families grow and change, facing new challenges.

5.0 Discussion

ACEs are common in Alaska, but the estimated prevalence depends upon the data source, type and number of elements included, as well as the age range being examined. When focusing on early childhood (0–3 years), about 47% of 3-year-old children were estimated to have experienced at least one ACE out of a total of 13 measured. The prevalence, based on 8 ACEs measured, was slightly lower (40%) when examining data representative of the full childhood period (0–17 years). In contrast, around 68% of adults in Alaska retrospectively reported experiencing at least one ACE (79% of adult

women) out of 8 measured. It should be noted that maltreatment was not included in the NSCH childhood ACE calculations, which may partially explain the stark difference between the childhood and adult self-reported prevalence estimates, despite both presumably covering the same age range. Unfortunately, there were no national comparisons available for early childhood that mimic the ALCANLink data source. Alaska prevalence estimates for childhood (0-17 years) ACEs using NSCH and adult ACEs using AK-BRFSS were similar to national estimates obtained with the same data sources.⁷

While rates of higher ACE composite scores (3+) fluctuated throughout the observed periods, their overall trends did not change drastically. There was a positive trend observed for zero ACEs in early childhood and childhood, with trends of one and two ACEs fluctuating to accommodate the change. Together, these results suggests that prevention efforts are likely reaching low-risk families, but there is perhaps a disconnect between the prevention and intervention programs available within Alaska and higher-risk families who need them (i.e., those experiencing multiple challenges).

The most common ACE experienced by children aged 3 years was familial financial hardship. This finding is consistent with research showing that parents see a significant reduction in income following the birth of a child, particularly for birthing parents who don't have access to paid parental leave.⁹⁵ At the same time, families experience increased household expenses related to raising a child and expanding the family (e.g., feeding supplies, clothes, child care expenses).⁹⁵ Together, these issues lead to heightened financial stress in parents of very young children, potentially making caring for themselves and their children difficult.⁹⁶ Relatedly, a recent report on early childhood adversity using NSCH data found that economic difficulty was the most common form of early childhood adversity; about one in five young children lived in a family that struggled to cover basics (e.g., food and housing).⁹⁷ The current report's results are consistent with CDC prevention

recommendations,⁷² which suggest that early childhood ACEs prevention should focus on developing affordable child care, parental leave policies, and ensuring financial assistance programs are easily accessible to families in need. Investment in the financial security of families extends to investment into the well-being of young Alaska children.

The most common ACE experienced by children aged ≤ 17 years, when not accounting for maltreatment, was parental divorce followed by financial hardship. A meta-analysis examining effects of divorce found that children of divorce experience a lower level of well-being (e.g., academic achievement, psychological adjustment, self-esteem or perceived competence, parental-child relations) than those that live in continuously intact families.⁹⁸ However, the effect sizes of these differences were weak overall. In addition, effects on well-being were less pronounced in studies conducted in more recent decades,⁹⁸ suggesting reduced stigma and more education toward attenuating divorce's impacts as time has gone on. Prior research suggests that the adversity experienced by children relates to exposure to high or protracted parental conflict surrounding divorce rather than the divorce itself.⁹⁸⁻¹⁰⁰ In fact, a recent study examining potential improvements to the original ACE scale found that parental divorce did not significantly predict adult distress symptoms or physical health.²² Furthermore, positive parenting has been found to buffer negative effects of parental conflict/divorce.^{101,102} Thus, ACE prevention policies for families at all stages should focus on building and promoting healthy family dynamics and positive parenting skills, no matter the family make-up. And ACE assessments should perhaps focus on parental conflict surrounding divorce rather than only the presence of divorce.

Interestingly, the most reported adult ACE in Alaska was mental injury (i.e., emotional or psychological abuse). This was true when looking both at all adults and only adult women. Emotional abuse is just as, if not more, detrimental to child development

compared to other types of abuse, especially in regards to risk for depression and low self-esteem or self-worth.¹⁰³⁻¹⁰⁵ Emotional abuse from caregivers can stem from anger and frustration at children due in part to a poor understanding of child development and/or poor parental attachment. Thus, programs targeted at educating parents on developmentally appropriate expectations for child behavior and at improving child-parent attunement (e.g., sensitivity to child cues) can be great assets for prevention of mental injury and related ACEs.^{72,106}

While all children are at risk for ACEs, children who were enrolled in Medicaid at birth, which can be a marker for poverty exposure, were disproportionately represented. This group had the highest percentage of four or more ACEs in all age perspectives compared to their counterparts. Medicaid enrollment is often used as a proxy for low socio-economic status, and as mentioned previously, growing up in an economically disadvantaged environment is linked with increased risk of a wide variety of negative outcomes.¹⁵⁻¹⁹ If one's basic needs are not being met or access to needed resources such as child care and/or healthcare are not financially feasible, then it becomes difficult to foster a healthy, nurturing, and stimulating environment for one's child. Within adult women, the relationship between ACEs and financial struggle appeared to continue into adulthood, partially speaking to the cyclic and generational nature of ACEs.

ACE disparities were also observed within Alaska Native/American Indian children across all age perspectives and within Black children during early childhood. Children identified within these two race groups had the highest or second highest percentages of four or more ACEs compared to their counterparts, depending on age range being assessed. Hispanic/Latino children also showed a high distribution of four or more adult ACEs (27%) compared to children of other races. These statistics are likely representative of unique stressors within the above communities of color, including systemic racism and service bias, along with potentially limited access to resources to address those stressors.

Black and AI/AN children are often overrepresented in child maltreatment reporting systems (e.g., OCS) due to intake and other biases,^{107,108} which might partially underly the early childhood ACE disparity observed for those groups.

It is critical that descriptive epidemiology not be misinterpreted as causal. Describing the who, what, where, and when of health outcomes is foundational to public health efforts but is limited in that it does not, nor attempts to, explain the why. Knowing what populations are disproportionately impacted can help target resources, interventions, and epidemiologic inferential studies. Groups of people experiencing disparities related to ACEs are experiencing a differential distribution of underlying modifiable risk factors. As such, local ACE prevention programs are needed across the state that can tailor prevention efforts to meet the needs of different populations who may be experiencing adversities unique to their environment. Public health policies or programs looking to aid in this effort should emphasize input from local communities and incorporate feedback from the populations being served to ensure creation and proper implementation of culturally appropriate, evidence-based ACE prevention and intervention programs.

One promising opportunity for future ACEs measurement to support prevention opportunities in Alaska is using syndromic surveillance data through the National Syndromic Surveillance Program (NSSP; <https://www.cdc.gov/nssp/overview.html>). These data offer timely, large-scale surveillance opportunities for a variety of health conditions. Syndromic surveillance collects limited, de-identified data about all emergency department visits at participating hospitals. Data can then be analyzed to identify visits involving conditions of interest concerning children, such as child abuse and neglect or homelessness. The resulting trends can be examined across a range of demographic and geographic factors and, in combination with other data sources, could help in understanding ACE-related community experiences. Scientists from the Alaska Department of Health and the CDC's

Division of Violence Prevention have already collaboratively developed an Adverse Childhood Experiences Dashboard within the NSSP analytic platform.¹⁰⁹ With this dashboard, they have begun exploring the utility of syndromic surveillance data to monitor near real-time indicators of ACEs among pediatric populations, household/community challenges among adults, and potential outcomes related to ACEs within the community (e.g., mental health conditions, suicide related outcomes, and drug overdose).

Finally, there are many prevention and intervention programs in line with CDC's recommended prevention strategies within Alaska. It may be overwhelming for parents or parents-to-be to research and/or find the various program offerings that address their specific household or personal situations. One solution is connecting families to care coordination/navigation programs and services (e.g., Help Me Grow®) that are familiar with Alaska's offerings so that families can be easily guided into what is right for them. In addition, care coordination allows warm hand-offs to occur between prenatal, birth, and pediatric care/services. Connection to such care coordination is important because evidence-based, culturally appropriate ACE prevention efforts are likely needed at early and frequent intervals to ensure responsiveness to dynamic family circumstances.

6.0 Limitations

PRAMS, CUBS, NSCH, AK-BRFSS, and AVS data rely on adults or youths self-reporting truthfully about negative and potentially stigmatizing experiences either they or their child experienced. As such, data may reflect social-desirability and recall bias. In addition, for cases where the caregiver was reporting for the child, it is possible that the caregiver was not privy to all experiences the child may have had, potentially underestimating ACEs. When calculating household challenge total scores using data from these surveys, missing responses were counted as a "no" response, which could also lead to underestimated counts.

When calculating ACEs, the current report used experiences identified by the surveys as ACEs (in the cases of NSCH, AK-BRFSS, and AVS) or focused on consistently represented experiences that most directly mirrored the original ACE study list^{2,12} modified to include financial challenges (in the case of ALCANLink).²¹ However, there are additional child adversities and traumas not measured within each of the data sources that could impact risk of negative health outcomes.¹¹⁰ In addition, ACEs and collection years were not consistent across data sources. For example, maltreatment experiences (e.g., physical abuse, sexual abuse, neglect) were included in ALCANLink, AK-BRFSS, and AVS measures, but not collected in the NSCH survey. Therefore, it is important to keep the source-specific definition of ACEs in mind when interpreting ACE prevalence in Alaska or comparing prevalence across states.

Though considered objective measures, maltreatment reports to the Office of Children's Services can also be influenced by bias.^{111,112} Children of color are often overrepresented in the system. For example, Black children are more likely to be reported for suspected maltreatment than white children overall, when not controlling for socioeconomic factors,¹¹³ and specifically among privately insured families.¹⁰⁷ Differences in community reporting thresholds could also affect who gets reported for child abuse and in what circumstances.¹¹⁴ Additionally, reported maltreatment may not reflect actual maltreatment experienced resulting in differential classification from what self-report would identify. These limitations need to be considered when evaluating trends with ALCANLink data, which uses reports to OCS for its maltreatment measures.

ALCANLink takes advantage of longitudinally linking survey data with administrative data, particularly OCS records. This linkage process has been validated and is updated annually.^{115,116} However, some matches may have been missed or incorrectly determined to not be matches during the manual review of potential records links. Missed

links could result in underestimation and incorrect links could result in overestimation of composite ACE scores and individual maltreatment prevalence.

The Youth Risk Behavior Survey (YRBS) is another resource that collects ACEs elements but was excluded from this report. The CDC's Division of Violence Prevention developed multiple ACE questions for the 2021 survey to enable states to measure lifetime prevalence and past-year incidence. Since the 2021 Alaska YRBS was cancelled due to COVID-related school staff limitations, this source was not included in this report. Although the YRBS is another promising source for examining certain ACE elements among our child and youth populations, it will not be a source for the entire set of ACEs elements needed to create an overall ACEs score.

ACE prevalence by race is described in this report to highlight opportunities for Alaska organizations and legislation to develop culturally sensitive programs and resources for ACE prevention and mitigation. However, disparities by race should not be interpreted as causal associations. Race as a variable does not properly represent the burdens of institutional racism and historical trauma (themselves considered ACEs) associated with poor outcomes in Alaska. Prior research in Alaska documented that crude associations between race and child maltreatment, for example, became insignificant after adjusting for socioeconomic risk factors disproportionately burdening certain populations.¹¹⁷ Thus, the underlying factors related to historical exposures and daily living in different environments should be the focus when interpreting causal mechanisms of racial disparities in ACE prevalence. The same focus should be applied to interpretations of disparities by any other demographic.

Finally, this report's goal was to describe the epidemiology of ACEs in Alaska, and so an in-depth discussion of the interactions between protective factors, resiliency, and ACEs was beyond the scope of the current project. Positive childhood experiences

and opportunities to build resilience are important contributing factors to ACE risk and reactions to adverse events. As such, future publications should extend the findings of this descriptive epidemiological report to examine and discuss potential protective factors and resiliency within the context of ACEs.

7.0 Conclusion

This report examined the descriptive epidemiology of ACEs in Alaska by three unique age perspectives: early childhood, childhood, and adult retrospective recall of childhood. When using concurrent reports during childhood periods, it was estimated that 47% of three-year-olds and 40% of children aged 0–17 had at least one ACE (out of 13 and 8 ACEs measured, respectively). A little less than 10% experienced four or more ACEs. Adult retrospective estimates were higher, with 68% of adults (79% of women) reporting they had experienced at least one ACE before the age of 18 (20% reported four or more ACEs). Alaska prevalence estimates for childhood (0-17 years) ACEs using NSCH and adult ACEs using AK-BRFSS were similar to national estimates obtained with the same data sources.⁷

The most common ACE varied by age perspectives, in part due to differences in ACE definitions between the data sources. These findings suggest that ACEs are common within the Alaskan population, and an estimated 47% of children have already experienced ACEs before 3 years of age.

While all children are at risk for ACEs, disparities were experienced by people of color and those with lower economic indicators. These findings highlight the complex issue of tailoring prevention efforts to meet the needs of different populations who may be experiencing adversities unique to their environment.

Alaska has many prevention and intervention programs in line with CDC's recommended prevention strategies. It is critical that these resources are culturally relevant and available to Alaskan

families early (before pregnancy) and throughout childhood. As families grow and change, so too will the challenges that they face. Prevention programs should reflect this transition and make it easy for families to find what they need by encouraging warm hand-offs between programs.

8.0 Figures and Tables

Table 1. Adverse childhood experiences (ACEs) measured by Alaska population data source – Alaska

ACE Component	ALCANLink (0–3 population)	NCHS (0–17 population)	AK-BRFSS (Adult recall of child experiences)	AVS (Adult women recall of child experiences)
Household Challenges				
Child Witnessed Violence	x			
Divorce	x	x	x	x
Financial Hardship	x	x		
Homeless	x			
Incarceration	x	x	x	x
Intimate Partner Violence	x	x	x	x
Job Loss	x			
Parental Death		x		
Mental Illness	x ¹	x	x	x
Substance Use	x ¹	x	x	x
Community Challenges				
Discrimination		n		
Neighborhood Violence		x		
Substance Abuse in Community	x			
Abuse & Neglect				
Emotional Abuse (Mental Injury)	x		x	x
Physical Abuse	x		x	x
Sexual Abuse	x		x	x
Emotional Neglect	x ²		n	
Physical Neglect	x ²		n	

x = Included in composite ACE score; n = Measured but not included in composite ACE score.

AK-BRFSS: Alaska Behavioral Risk Factor Surveillance System (2013–2015); ALCANLink: Alaska Longitudinal Child Abuse and Neglect Linkage project (2009–2018); AVS: Alaska Victimization Survey (2020); NSCH: National Survey of Children’s Health (2016–2021), Alaska residents.

Same numbered superscripts indicate multiple experiences that are measured as a single ACE construct in a data source (e.g., mental illness in the household and substance use in the household are measured together as one ACE in ALCANLink).

Table 2. Childhood Understanding Behaviors Survey (CUBS) questions representing adverse childhood experience (ACE) household challenge components — Alaska, 2012–2020

Household Challenge	Time Frame / Question Set Up	2012–2014 CUBS Questions	2015–2019 CUBS Questions	2020 CUBS Questions
Child Witnessed Violence in Household	Has your child <i>ever</i> experienced	Seeing violence or physical abuse in person	Witnessed violence or physical abuse between household members	Witnessed violence or physical abuse between household members
Divorce ^a	(1) Since your 3-year-old child was born (2) At time of survey	(1) My marital status changed (marriage, divorce, separation, became a widow) (2) What is your marital status?	(1) My marital status changed (marriage, divorce, separation, became a widow) (2) What is your marital status?	My marital status changed
Financial Hardship	Since your 3-year-old child was born	I had a lot of bills I couldn't pay	I had problems paying the rent, mortgage or other bills	I had problems paying the rent, mortgage or other bills
Homeless	Since your 3-year-old child was born	I was homeless	I was homeless or had to sleep outside, in a car or in a shelter	I was homeless or had to sleep outside, in a car or in a shelter
Incarcerated	Since your 3-year-old child was born	My husband or partner or I went to jail	My husband, partner or I went to jail	My husband, partner or I went to jail
Intimate Partner Violence ^b	In the past 12 months	(1) Did your husband or partner push, hit, slap, kick, choke or physically hurt you in any other way? (2) Did your husband or partner threaten you, limit your activities against your will, or make you feel unsafe in any other way?	(1) Did your husband or partner push, hit, slap, kick, choke or physically hurt you in any other way? (2) Did your husband or partner threaten you, limit your activities against your will, or make you feel unsafe in any other way?	(1) Did your husband or partner push, hit, slap, kick, choke or physically hurt you in any other way? (2) Did your husband or partner threaten you, limit your activities against your will, or make you feel unsafe in any other way?
Job Loss ^b	Since your 3-year-old child was born	(1) I lost my job (2) My husband or partner lost his job	My husband, partner or I lost a job	My husband, partner or I lost a job
Mental Illness / Substance Abuse in Household ^b	Has your child <i>ever</i> experienced	Alcoholism or mental health disorder in family	Alcoholism or mental health disorder among household members	(1) Living with someone who had a problem with alcohol or drugs (2) Living with someone who was mentally ill, suicidal, or severely depressed
Substance Abuse in Close Community	Since your 3-year-old child was born	Someone very close to me had a problem with drinking or drugs	Someone very close to me had a problem with drinking or drugs	Someone very close to me had a problem with drinking or drugs

^a In 2012–2019 CUBS phases, birthing parent experienced separation or divorce during early childhood period if they either: (1) Were married at time of baby's birth based on birth records AND marked they were divorced, separated, or widowed on CUBS; or (2) Were married at time of baby's birth AND marked their marital status changed on CUBS; or (3) Were not married at time of baby's birth AND indicated they were divorced, separated, or widowed on CUBS AND marked their marital status changed on CUBS. In 2020 CUBS survey year, birthing parent experienced separation or divorce during early childhood period if they were married at time of baby's birth AND marked their marital status changed on CUBS. ^b A yes response to at least one of the listed questions indicated exposure to the household challenge indicator.

Table 3. NSCH questions representing adverse childhood experiences (ACEs) since the child was born (ages 0–17) — Alaska, 2016–2021

ACE	2016 Questions	Exposure Responses ^a	Questions in Subsequent Years (Changes Italicized)
Divorce	Parent or guardian divorced or separated	Yes	None
Financial Hardship	How often has it been very hard to get by on your family’s income – hard to cover the basics like food or housing?	Somewhat often or very often	(1) 2018–2019: How often has it been very hard <i>to cover the basics, like food and housing, on your family's income?</i> (2) 2020–2021: ... like food <i>or</i> housing, on your family's income?
Incarceration	Parent or guardian served time in jail	Yes	(1) 2021: Parent or guardian served time in jail <i>or prison</i>
IPV	Saw or heard parents or adults slap, hit, kick, punch one another in the home	Yes	None
Mental Illness in Household	Lived with anyone who was mentally ill, suicidal, or severely depressed	Yes	None
Neighborhood Violence	Was a victim of violence or witnessed violence in neighborhood	Yes	(1) 2017–2019: Was a victim of violence or witnessed violence in <i>his or her</i> neighborhood (2) 2020–2021: ... in <i>their</i> neighborhood
Parental Death	Parent or guardian died	Yes	None
Substance Abuse in Household	Lived with anyone who had a problem with alcohol or drugs	Yes	None
Discrimination ^b	(1) Treated or judged unfairly because of his or her race or ethnic group	Yes	(1) 2020–2021: Treated or judged unfairly because of <i>their</i> race or ethnic group (2) 2020: Added additional question, “Treated or judged unfairly because of their sexual orientation or gender identity (ages 6–17)” (3) 2021: Added additional question, “Treated or judged unfairly because of a health condition or disability”

IPV: Intimate partner violence; NSCH: National Survey of Children’s Health (2016–2021), Alaska residents.

^a Response options endorsed by participants which indicated the child experienced the designated ACE.

^b Variable not included in Composite ACE Score.

Table 4. Alaska BRFSS questions representing adult retrospectively reported adverse childhood experiences (ACEs; ages 0–17) — Alaska, 2013–2015

ACE	Questions	Exposure Responses ^a
Divorce	Were your parents separated or divorced?	Yes
Incarceration	Did you live with anyone who served time or was sentenced to serve time in a prison, jail, or other correctional facility?	Yes
IPV	How often did your parents or adults in your home ever slap, hit, kick, punch, or beat each other up?	Once or more than once
Mental Illness in Household	Did you live with anyone who was depressed, mentally ill, or suicidal?	Yes
Mental Injury (Emotional Abuse)	How often did a parent or adult in your home ever swear at you, insult you, or put you down?	Once or more than once
Physical Abuse	How often did a parent or adult in your home ever hit, beat, kick, or physically hurt you in any way? Do not include spanking.	Once or more than once
Sexual Abuse ^b	(1) How often did anyone at least 5 years older than you or an adult force you to have sex? (2) How often did anyone at least 5 years older than you or an adult, ever touch you sexually? (3) How often did anyone at least 5 years older than you or an adult try to make you touch them sexually?	Once or more than once
Substance Abuse in Household ^b	(1) Did you live with anyone who was a problem drinker or alcoholic? (2) Did you live with anyone who used illegal street drugs or who abused prescription medications?	Once or more than once
Emotional Neglect ^c	How often did you feel that your parents or adults in your home did not love you or appreciate you?	Once or more than once
Physical Neglect ^c	How often did ANY of the following events apply to you: you didn't have enough to eat, you had to wear dirty clothes, or you had no one to protect you?	Once or more than once

BRFSS: Behavioral Risk Factor Surveillance System (2013–2015); IPV: Intimate partner violence

^a Response options endorsed by participants that indicated they experienced the designated ACE.

^b An exposure response to any of the listed questions indicated exposure to the ACE indicator.

^c Question representing ACE was not asked in the 2013 Alaska BRFSS survey. Variable not included in Composite ACE Score.

Table 5. Alaska Victimization Survey questions representing retrospectively reported adverse childhood experiences (ages 0–17) among adult women — Alaska, 2020

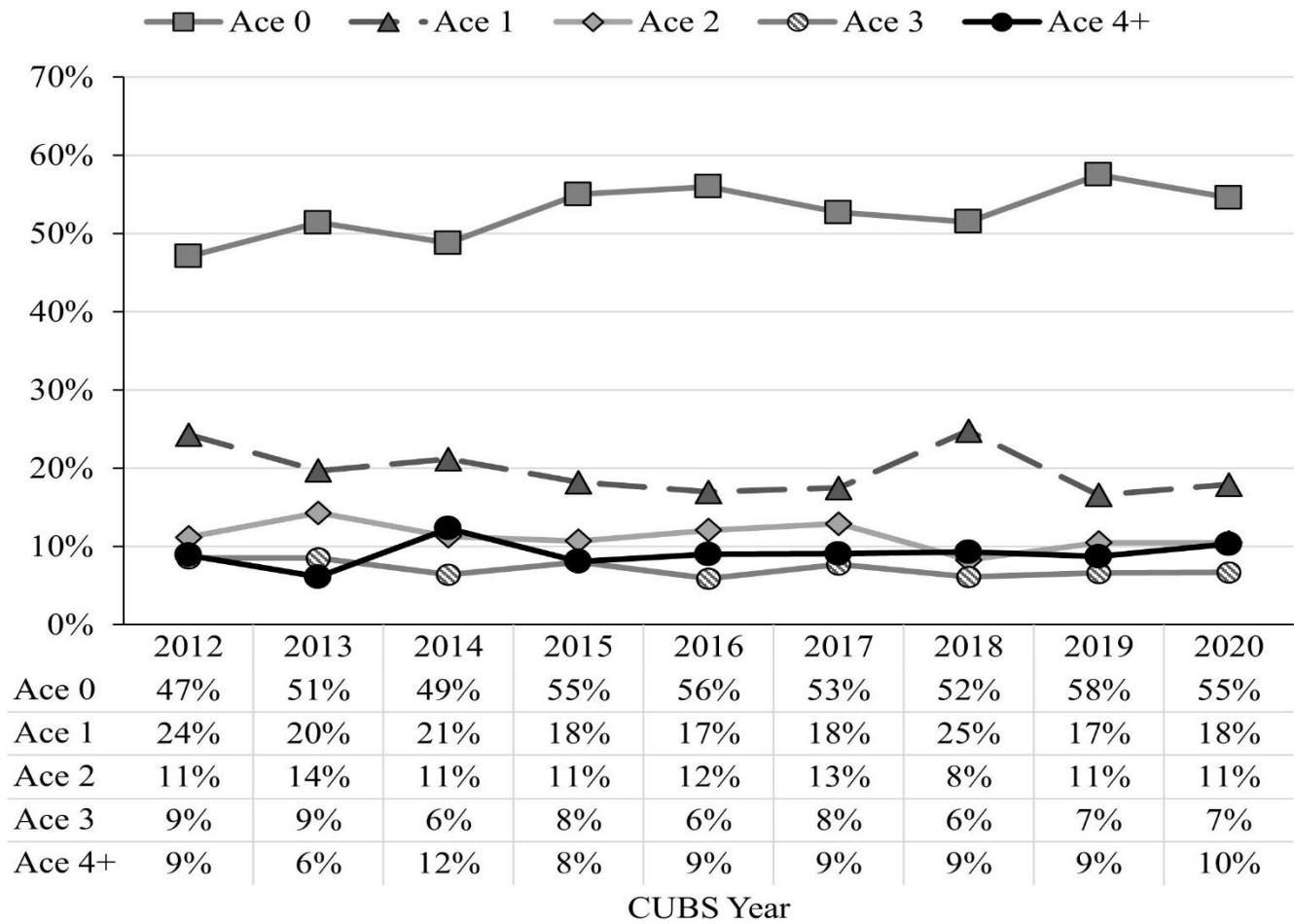
ACE	Questions	Exposure Responses^a
Divorce	Were your parents separated or divorced?	Yes
Incarceration	Did you live with anyone who served time or was sentenced to serve time in a prison, jail, or other correctional facility?	Yes
IPV	How often did your parents or adults in your home ever slap, hit, kick, punch, or beat each other up?	Once or more than once
Mental Illness in Household	Did you live with anyone who was depressed, mentally ill, or suicidal?	Yes
Mental Injury (Emotional Abuse)	How often did a parent or adult in your home ever swear at you, insult you, or put you down?	Once or more than once
Physical Abuse	How often did a parent or adult in your home ever hit, beat, kick, or physically hurt you in any way? Do not include spanking.	Once or more than once
Sexual Abuse	How often did anyone at least 5 years older than you or an adult ever touch you sexually, try to make you touch them sexually, or force you to have sex?	Once or more than once
Substance Abuse in Household ^b	(1) Did you live with anyone who was a problem drinker or alcoholic? (2) Did you live with anyone who used illegal street drugs or who abused prescription medications?	Yes

IPV: Intimate partner violence

^a Response options endorsed by participants that indicated they experienced the designated ACE.

^b A yes response to any of the listed questions indicated exposure to the ACE indicator.

Figure 1. Weighted percentage of adverse childhood experience (ACE) scores among 3-year-olds — Alaska, ALCANLink, 2012–2020



Notes: Data from the Alaska Longitudinal Child Abuse and Neglect Linkage project (ALCANLink). CUBS: Childhood Understanding Behaviors Survey. Data linked with child welfare records (OCS).

Table 6. Weighted percentage (95% CI) of ACE scores within each demographic characteristic among 3-year-olds — Alaska, ALCANLink, 2012–2020

	0 ACEs	1 ACE	2 ACEs	3 ACEs	4+ ACEs
Sex					
Male	53 (51, 55)	19 (17, 21)	11 (10, 13)	8 (6, 9)	9 (8, 11)
Female	52 (50, 55)	21 (18, 23)	11 (10, 13)	7 (6, 8)	9 (8, 11)
Race^a					
Alaska Native / American Indian	34 (32, 37)	22 (20, 24)	15 (13, 17)	12 (10, 13)	17 (16, 19)
Asian	59 (51, 66)	21 (16, 28)	13 (9, 19)	2 (1, 6)	5 (3, 10)
Black	43 (31, 57)	22 (13, 34)	14 (7, 26)	1 (1, 2)	20 (11, 35)
Pacific Islander	36 (21, 56)	28 (13, 49)	28 (13, 50)	1 (0.2, 2)	8 (2, 24)
White	60 (58, 63)	18 (16, 20)	9 (8, 11)	6 (5, 8)	6 (5, 7)
Unknown	52 (40, 63)	22 (13, 35)	11 (5, 20)	2 (1, 4)	14 (6, 29)
PHR					
Anchorage	55 (52, 58)	20 (18, 23)	11 (9, 13)	6 (5, 8)	8 (7, 10)
Gulf Coast	53 (47, 59)	22 (18, 28)	10 (7, 15)	6 (4, 10)	8 (6, 12)
Interior	53 (48, 58)	20 (16, 24)	11 (8, 15)	8 (6, 11)	8 (6, 11)
Mat-Su	59 (54, 65)	16 (12, 20)	10 (7, 13)	7 (5, 11)	8 (5, 11)
Northern	35 (29, 41)	22 (17, 27)	18 (13, 23)	11 (8, 15)	15 (11, 19)
Southeast	51 (44, 57)	18 (14, 24)	13 (9, 18)	8 (5, 12)	11 (7, 15)
Southwest	41 (37, 46)	21 (17, 24)	14 (12, 18)	10 (8, 13)	14 (11, 17)
Medicaid					
Enrolled	38 (36, 41)	21 (19, 24)	15 (13, 16)	11 (9, 13)	15 (13, 17)
Not Enrolled	68 (66, 71)	18 (16, 20)	8 (7, 10)	3 (3, 4)	3 (2, 4)

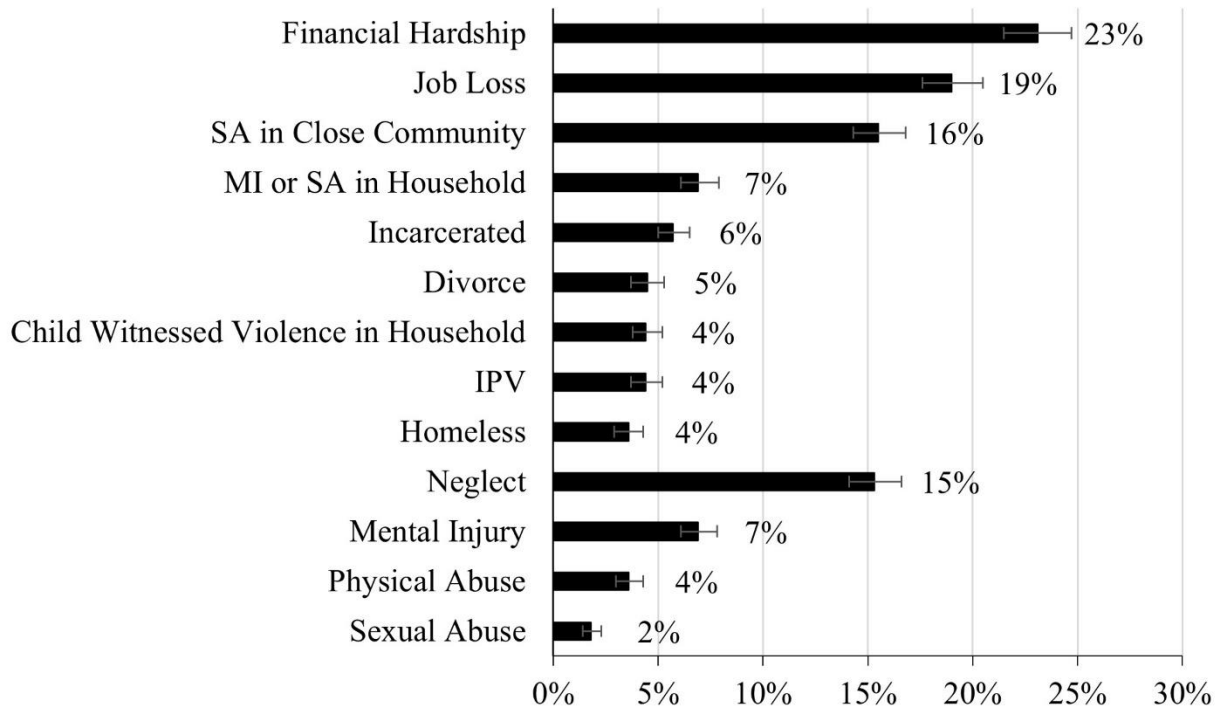
ACE: Adverse childhood experiences; ALCANLink: Alaska Longitudinal Child Abuse and Neglect Linkage project; CI: Confidence interval; Mat-Su: Matanuska-Susitna; PHR: Public health region of residence at time of birth; Medicaid: Medicaid enrollment status at time of birth.

Years displayed are Childhood Behaviors Understanding Survey collection years.

Percentages may not sum to 100 due to rounding.

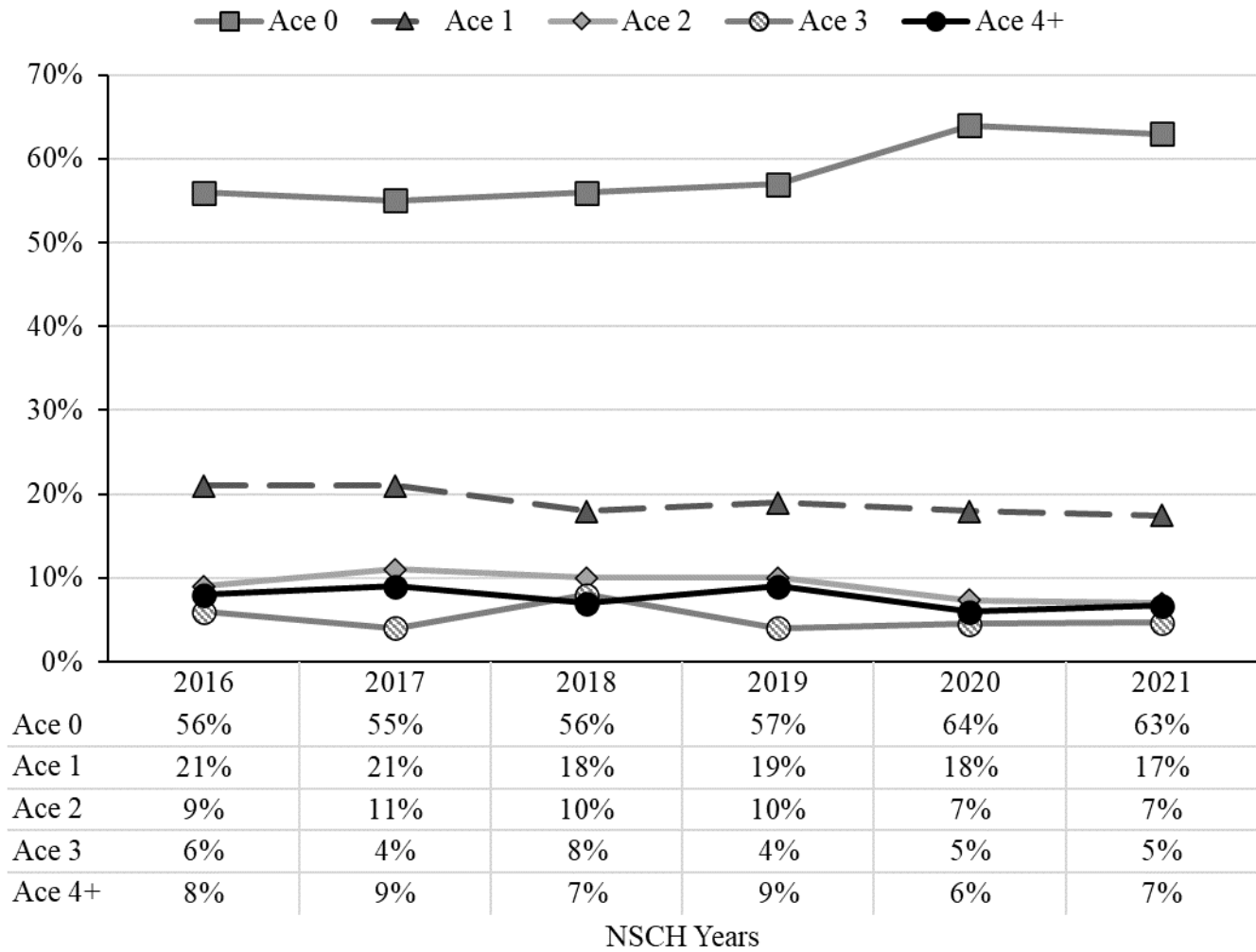
^a Race was indicated on the birth certificate. If multi-racial, race was coded using the following hierarchical method: If Alaska Native/American Indian (AN/AI) was one of the identified races, then coded as AN/AI; else if Pacific Islander was one of the identified races, then coded as Pacific Islander; else if Black was one of the identified races, then coded as Black; else if Asian was one of the identified races, then coded as Asian; else if White was one of the identified races, then coded as White.

Figure 2. Weighted percentage of individual adverse childhood experiences (ACEs) among 3-year-olds — Alaska, ALCANLink, 2012–2020



Notes: Data from the Alaska Longitudinal Child Abuse and Neglect Linkage project (ALCANLink). Bars indicate 95% Confidence Interval. IPV: Intimate partner violence; MI: Mental illness; SA: Substance abuse. See Table 2 for description of household challenge ACEs.

Figure 3. Weighted percentage of adverse childhood experience (ACE) scores among children aged 0–17 years — Alaska, NSCH, 2016–2021



Notes: Data from the National Survey of Children's Health (NSCH), Alaska residents.

Table 7. Weighted percentage (95% CI) of ACE scores within each demographic characteristic among children aged 0–17 years — Alaska, NSCH, 2016–2021

	0 ACEs	1 ACE	2 ACEs	3 ACEs	4+ ACEs
Sex					
Male	58 (55, 61)	19 (17, 22)	9 (8, 12)	6 (5, 8)	7 (5, 8)
Female	59 (56, 62)	19 (17, 22)	9 (7, 11)	5 (3, 6)	8 (7, 11)
Race^a					
Alaska Native / American Indian Alone	38 (30, 47)	22 (16, 31)	14 (9, 23)	6 (3, 12)	18 (13, 26)
Asian Alone	65 (55, 74)	24 (17, 33)	7 (3, 14)	4 (1, 19)	1 (0, 2)
Black Alone	50 (35, 64)	33 (20, 50)	12 (5, 28)	2 (1, 6)	3 (1, 12)
Pacific Islander Alone	70 (51, 84)	14 (6, 30)	11 (3, 35)	1 (0, 3)	4 (1, 17)
White Alone	66 (63, 68)	16 (14, 18)	8 (7, 9)	5 (4, 6)	6 (4, 7)
Two or More Races	49 (44, 54)	22 (18, 26)	10 (7, 14)	8 (6, 11)	11 (8, 14)
Medicaid^b					
Enrolled	37 (33, 42)	24 (20, 28)	13 (10, 16)	10 (7, 13)	16 (13, 20)
Not Enrolled	72 (69, 74)	16 (14, 18)	7 (5, 8)	3 (2, 4)	3 (2, 3)

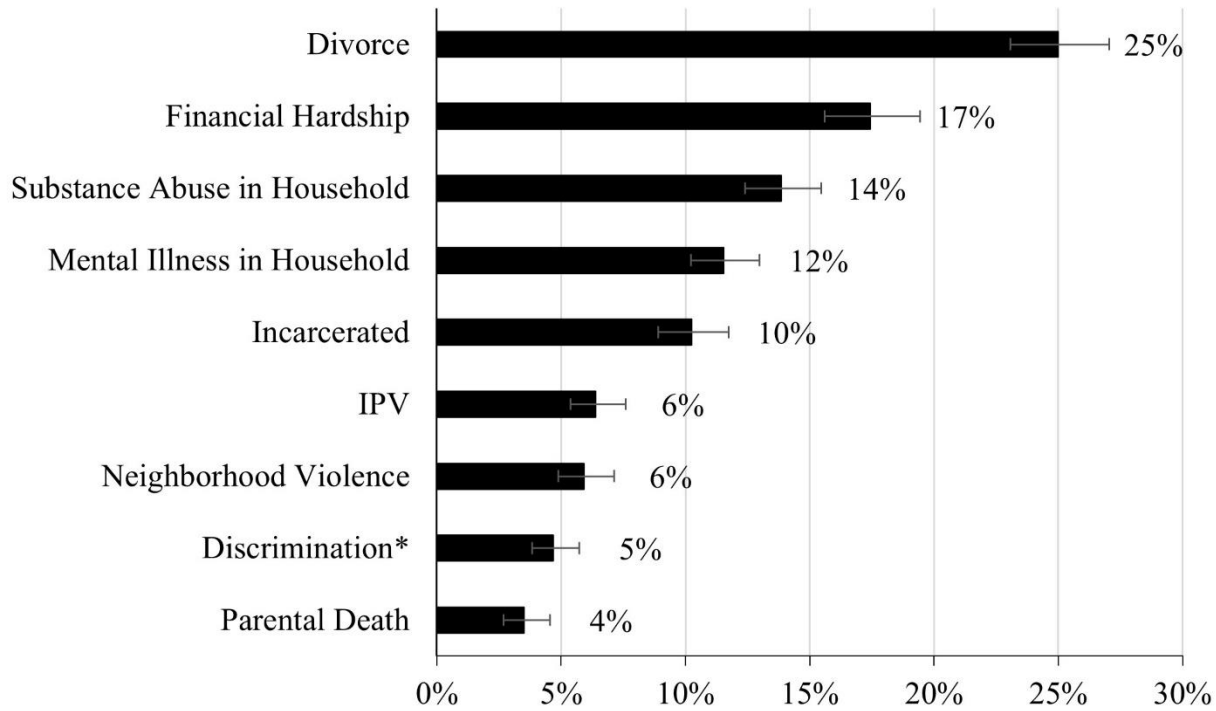
ACE: Adverse childhood experiences; CI: Confidence interval; Medicaid: Child enrollment status in Medicaid or other government health insurance at time of survey; NSCH: National Survey of Children's Health, Alaska residents.

Percentages may not sum to 100 due to rounding.

^a Race was self-reported. Black Alone = Black or African American alone; Pacific Islander Alone = Native Hawaiian and other Pacific Islander alone.

^b Question asked if child was covered by Medicaid, Medical Assistance, or any kind of government assistance plan for those with low incomes or a disability.

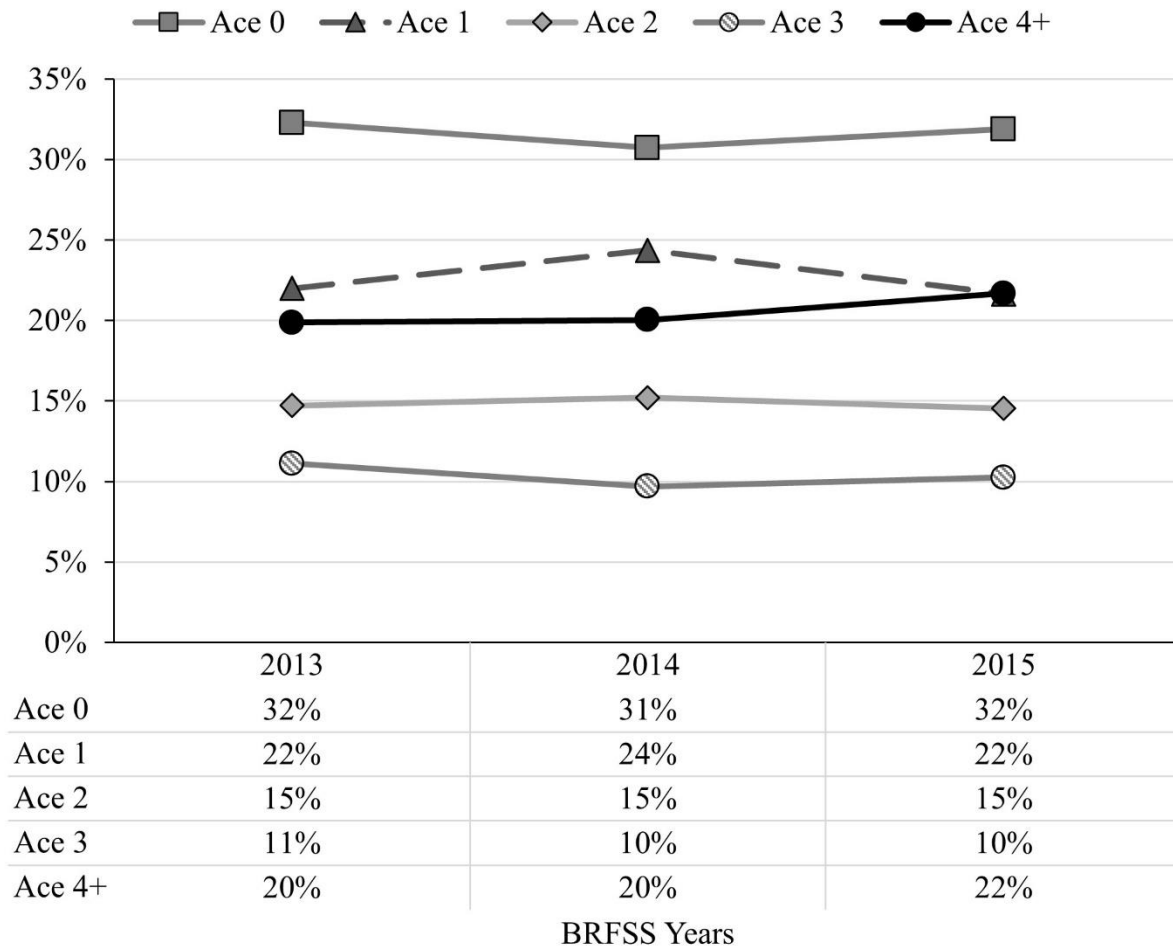
Figure 4. Weighted percentage of individual adverse childhood experiences (ACEs) among children aged 0–17 years — Alaska, NSCH, 2016–2021



Notes: Data from National Survey of Children's Health (NSCH), Alaska residents. Bars indicate 95% Confidence Interval. IPV: Intimate partner violence. See Table 3 for description of ACEs.

** = Not included in composite ACE score.*

Figure 5. Weighted percentage of adult adverse childhood experience (ACE) scores — Alaska, AK-BRFSS, 2013–2015



Notes: Data reported from Alaska Behavioral Risk Factor Surveillance System (AK-BRFSS).

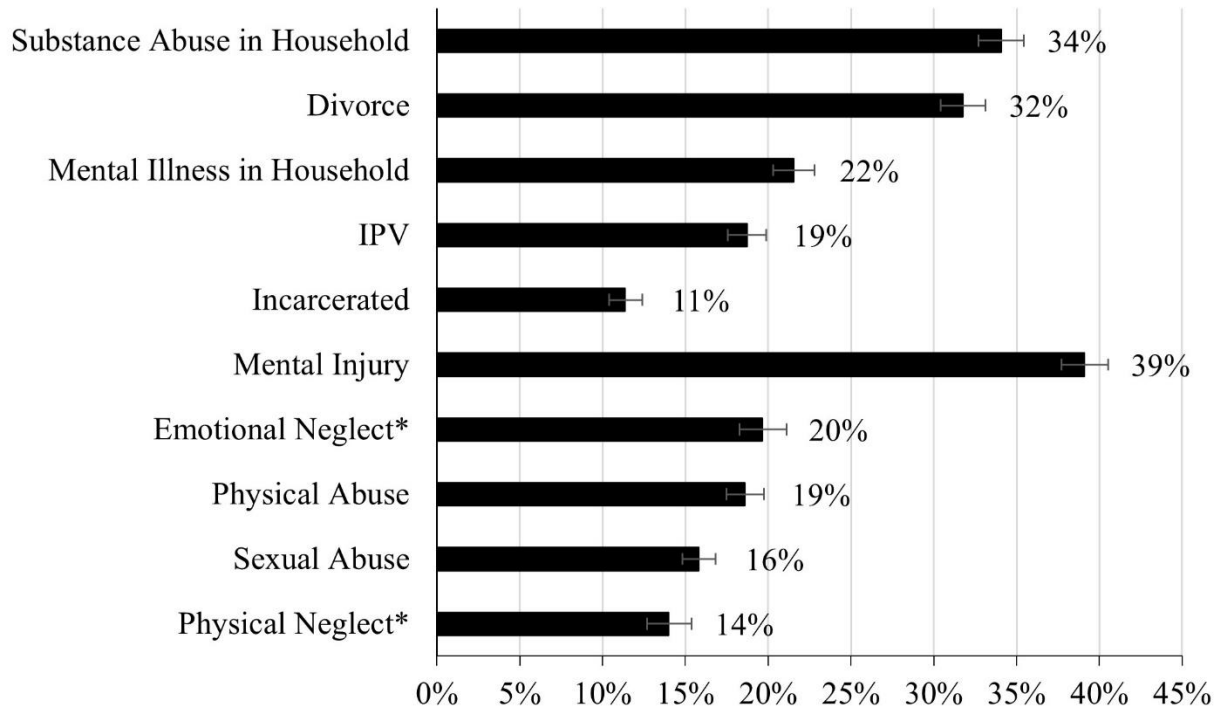
Table 8. Weighted percentage (95% CI) of adult ACE scores within each demographic characteristic — Alaska, AK-BRFSS, 2013–2015

	0 ACEs	1 ACE	2 ACEs	3 ACEs	4+ ACEs
Sex					
Male	33 (32, 35)	24 (23, 26)	15 (14, 17)	10 (8, 11)	17 (16, 19)
Female	30 (28, 32)	21 (19, 23)	14 (13, 16)	11 (10, 13)	24 (22, 25)
Race^a					
Alaska Native / American Indian	24 (21, 27)	19 (16, 21)	15 (13, 18)	12 (10, 14)	30 (27, 34)
Asian	39 (31, 48)	28 (20, 38)	15 (10, 23)	7 (4, 13)	11 (6, 19)
Black	29 (20, 38)	23 (15, 32)	18 (12, 28)	11 (6, 18)	19 (12, 29)
Hispanic / Latino	29 (22, 36)	18 (13, 25)	14 (9, 20)	13 (8, 19)	27 (19, 35)
Pacific Islander	43 (27, 59)	29 (16, 46)	7 (20, 19)	5 (1, 22)	16 (8, 31)
White	33 (31, 34)	23 (22, 25)	15 (14, 16)	1 (9, 11)	19 (18, 20)
Multiracial / Other	24 (13, 40)	26 (14, 44)	10 (4, 25)	10 (4, 22)	30 (16, 48)
PHR					
Anchorage	30 (28, 33)	24 (22, 27)	15 (13, 17)	10 (9, 12)	20 (18, 22)
Gulf Coast	33 (31, 36)	22 (20, 25)	15 (13, 18)	8 (7, 10)	21 (18, 23)
Interior	34 (31, 36)	23 (20, 25)	13 (11, 15)	11 (9, 12)	20 (18, 22)
Mat-Su	31 (28, 35)	20 (17, 22)	15 (13, 18)	10 (9, 13)	23 (20, 27)
Northern	32 (26, 38)	21 (16, 27)	12 (8, 17)	11 (8, 16)	24 (19, 29)
Southeast	31 (28, 34)	22 (20, 25)	16 (14, 19)	12 (10, 14)	19 (17, 22)
Southwest	34 (29, 39)	21 (17, 25)	16 (12, 21)	11 (8, 14)	19 (15, 22)
Poverty					
Below FPG	26 (22, 30)	18 (14, 22)	15 (12, 19)	13 (10, 17)	29 (24, 33)
Not Below FPG	32 (30, 33)	23 (22, 25)	15 (14, 16)	10 (9, 11)	20 (18, 21)

ACE: Adverse childhood experiences; AK-BRFSS: Alaska Behavioral Risk Factor Surveillance System; CI: Confidence interval; FPG: Federal poverty guideline for Alaska; Mat-Su: Matanuska-Susitna; PHR: Public health region of residence. Percentages may not sum to 100 due to rounding.

^a Race was self-reported and coded as: Alaska Native/American Indian (any mention), Asian (non-Hispanic), Black or African American (non-Hispanic), Hispanic or Latino, Native Hawaiian or Other Pacific Islander (non-Hispanic), White (non-Hispanic), and multiracial/other race.

Figure 6. Weighted percentage of individual adult adverse childhood experiences (ACEs) — Alaska, AK-BRFSS, 2013–2015



Notes: Data reported from 2013–2015 Alaska Behavioral Risk Factor Surveillance System (AK-BRFSS). Bars indicate 95% Confidence Interval. See Table 4 for description of ACEs.

* = Not included in composite ACE score.

Table 9. Weighted percentage (95% CI) of ACE scores among Alaska women aged ≥18 years by demographic characteristic — Alaska Victimization Survey, 2020

	0 ACEs	1 ACE	2 ACEs	3 ACEs	4+ ACEs
Race^a					
Alaska Native / American Indian	20 (12, 31)	13 (7, 22)	8 (3, 17)	17 (10, 27)	43 (33, 54)
White	21 (19, 23)	18 (16, 20)	16 (14, 19)	14 (12, 16)	31 (28, 34)
Other	29 (19, 42)	16 (10, 26)	13 (6, 26)	13 (7, 24)	27 (18, 39)
Two or More Races	5 (3, 9)	16 (10, 25)	11 (7, 17)	12 (8, 19)	55 (46, 64)
Financial Stress^b					
Yes	17 (14, 21)	13 (11, 16)	13 (11, 16)	15 (12, 19)	42 (38, 46)
No	27 (23, 30)	22 (13, 26)	16 (13, 20)	13 (10, 15)	22 (19, 26)

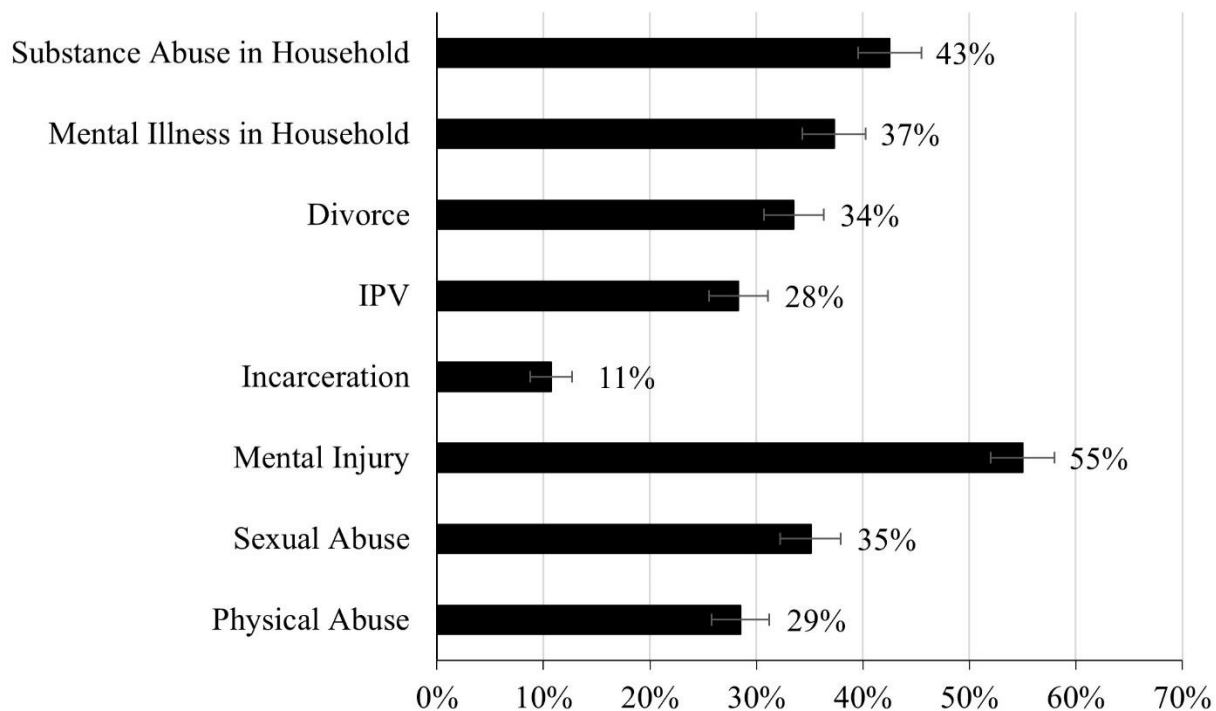
ACE: Adverse childhood experiences; CI: Confidence interval.

Percentages may not sum to 100 due to rounding.

^a Race was self-reported and coded as: Alaska Native/American Indian alone, White alone, other race alone (includes Black and African American, Asian, Native Hawaiian or Other Pacific Islander), and two or more races.

^b Respondents coded as experiencing financial stress if they responded yes when asked if in the past 12 months they needed to see a doctor but could not because they couldn't afford it OR if respondents indicated they sometimes, usually, or always experienced either of the following in the past 12 months: (1) Worried or stressed about having enough money to pay rent or mortgage; or (2) Worried or stressed about having enough money to buy nutritious meals.

Figure 7. Weighted percentage of individual adult adverse childhood experiences (ACEs) among women aged ≥18 years — Alaska, Alaska Victimization Survey, 2020



Notes: Data reported from 2020 Alaska Victimization Survey. Bars indicate 95% Confidence Interval. See Table 5 for description of ACEs.

9.0 References

1. Center for Disease Control and Prevention. Fast facts: Preventing adverse childhood experiences. Published online April 6, 2022. Accessed December 14, 2022. <https://www.cdc.gov/violenceprevention/aces/fastfact.html>
2. Felitti VJ, Anda RF, Nordenberg D, et al. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. *Am J Prev Med*. 1998;14(4):245-258. doi:10.1016/S0749-3797(98)00017-8
3. Petruccelli K, Davis J, Berman T. Adverse childhood experiences and associated health outcomes: a systematic review and meta-analysis. *Child Abuse Negl*. 2019;97:104127. doi:10.1016/j.chiabu.2019.104127
4. Shonkoff JP, Garner AS, The Committee on Psychosocial Aspects of Child and Family Health, Committee on Early Childhood, Adoption, and Dependent Care, and Section on Developmental and Behavioral Pediatrics, et al. The Lifelong Effects of Early Childhood Adversity and Toxic Stress. *Pediatrics*. 2012;129(1):e232-e246. doi:10.1542/peds.2011-2663
5. Hogg B, Gardoki-Souto I, Valiente-Gómez A, et al. Psychological trauma as a transdiagnostic risk factor for mental disorder: An umbrella meta-analysis. *Eur Arch Psychiatry Clin Neurosci*. Published online October 8, 2022. doi:10.1007/s00406-022-01495-5
6. Center for Disease Control and Prevention. Adverse childhood experiences prevention strategy: FY2021-FY2024. Published online September 1, 2020. Accessed December 14, 2022. https://www.cdc.gov/injury/pdfs/priority/ACEs-Strategic-Plan_Final_508.pdf
7. Merrick MT, Ford DC, Ports KA, et al. *Vital signs*: Estimated proportion of adult health problems attributable to adverse childhood experiences and implications for prevention — 25 states, 2015–2017. *MMWR Morb Mortal Wkly Rep*. 2019;68(44):999-1005. doi:10.15585/mmwr.mm6844e1
8. Sheats KJ, Irving SM, Mercy JA, et al. Violence-related disparities experienced by black youth and young adults: Opportunities for prevention. *Am J Prev Med*. 2018;55(4):462-469. doi:10.1016/j.amepre.2018.05.017
9. Merrick MT, Ford DC, Ports KA, Guinn AS. Prevalence of adverse childhood experiences from the 2011-2014 behavioral risk factor surveillance system in 23 states. *JAMA Pediatr*. 2018;172(11):1038. doi:10.1001/jamapediatrics.2018.2537
10. Giano Z, Camplain RL, Camplain C, et al. Adverse childhood events in american indian/alaska native populations. *Am J Prev Med*. 2021;60(2):213-221. doi:10.1016/j.amepre.2020.08.020
11. Austin A, Herrick H, Proescholdbell S. Adverse childhood experiences related to poor adult health among lesbian, gay, and bisexual individuals. *Am J Public Health*. 2016;106(2):314-320. doi:10.2105/AJPH.2015.302904
12. Anda RF, Croft JB, Felitti VJ, et al. Adverse childhood experiences and smoking during adolescence and adulthood. *JAMA*. 1999;282(17):1652. doi:10.1001/jama.282.17.1652

13. Dube SR, Anda RF, Felitti VJ, Chapman DP, Williamson DF, Giles WH. Childhood abuse, household dysfunction, and the risk of attempted suicide throughout the life span: Findings from the Adverse Childhood Experiences Study. *JAMA*. 2001;286(24):3089. doi:10.1001/jama.286.24.3089
14. Dube SR, Anda RF, Felitti VJ, Croft JB, Edwards VJ, Giles WH. Growing up with parental alcohol abuse: Exposure to childhood abuse, neglect, and household dysfunction. *Child Abuse Negl*. 2001;25(12):1627-1640. doi:10.1016/S0145-2134(01)00293-9
15. Braveman P, Heck K, Egerter S, Rinki C, Marchi K, Curtis M. Economic hardship in childhood: A neglected issue in ACE studies? *Matern Child Health J*. 2018;22(3):308-317. doi:10.1007/s10995-017-2368-y
16. Duncan GJ, Ziol-Guest KM, Kalil A. Early-childhood poverty and adult attainment, behavior, and health. *Child Dev*. 2010;81(1):306-325. doi:10.1111/j.1467-8624.2009.01396.x
17. Holzer HJ, Whitmore Schanzenbach D, Duncan GJ, Ludwig J. The economic costs of childhood poverty in the United States. *J Child Poverty*. 2008;14(1):41-61. doi:10.1080/10796120701871280
18. Galobardes B, Lynch JW, Smith GD. Is the association between childhood socioeconomic circumstances and cause-specific mortality established? Update of a systematic review. *J Epidemiol Community Health*. 2008;62(5):387-390. doi:10.1136/jech.2007.065508
19. Melchior M, Moffitt TE, Milne BJ, Poulton R, Caspi A. Why do children from socioeconomically disadvantaged families suffer from poor health when they reach adulthood? A life-course study. *Am J Epidemiol*. 2007;166(8):966-974. doi:10.1093/aje/kwm155
20. Finkelhor D, Shattuck A, Turner HA, Ormrod R, Hamby SL. Polyvictimization in developmental context. *J Child Adolesc Trauma*. 2011;4(4):291-300. doi:10.1080/19361521.2011.610432
21. Finkelhor D, Shattuck A, Turner H, Hamby S. Improving the adverse childhood experiences study scale. *JAMA Pediatr*. 2013;167(1):70. doi:10.1001/jamapediatrics.2013.420
22. Finkelhor D, Shattuck A, Turner H, Hamby S. A revised inventory of adverse childhood experiences. *Child Abuse Negl*. 2015;48:13-21. doi:10.1016/j.chiabu.2015.07.011
23. Karatekin C, Hill M. Expanding the original definition of adverse childhood experiences (ACEs). *J Child Adolesc Trauma*. 2019;12(3):289-306. doi:10.1007/s40653-018-0237-5
24. Wade R, Shea JA, Rubin D, Wood J. Adverse childhood experiences of low-income urban youth. *Pediatrics*. 2014;134(1):e13-e20. doi:10.1542/peds.2013-2475
25. Anda RF, Butchart A, Felitti VJ, Brown DW. Building a framework for global surveillance of the public health implications of adverse childhood experiences. *Am J Prev Med*. 2010;39(1):93-98. doi:10.1016/j.amepre.2010.03.015
26. McLaughlin KA, Greif Green J, Gruber MJ, Sampson NA, Zaslavsky AM, Kessler RC. Childhood adversities and first onset of psychiatric disorders in a national sample of US adolescents. *Arch Gen Psychiatry*. 2012;69(11):1151. doi:10.1001/archgenpsychiatry.2011.2277

27. Merrick MT, Ports KA, Ford DC, Afifi TO, Gershoff ET, Grogan-Kaylor A. Unpacking the impact of adverse childhood experiences on adult mental health. *Child Abuse Negl.* 2017;69:10-19. doi:10.1016/j.chiabu.2017.03.016
28. Dong M, Anda RF, Felitti VJ, et al. The interrelatedness of multiple forms of childhood abuse, neglect, and household dysfunction. *Child Abuse Negl.* 2004;28(7):771-784. doi:10.1016/j.chiabu.2004.01.008
29. Dong M, Anda RF, Dube SR, Giles WH, Felitti VJ. The relationship of exposure to childhood sexual abuse to other forms of abuse, neglect, and household dysfunction during childhood. *Child Abuse Negl.* 2003;27(6):625-639. doi:10.1016/S0145-2134(03)00105-4
30. LaNoue MD, George BJ, Helitzer DL, Keith SW. Contrasting cumulative risk and multiple individual risk models of the relationship between Adverse Childhood Experiences (ACEs) and adult health outcomes. *BMC Med Res Methodol.* 2020;20(1):239. doi:10.1186/s12874-020-01120-w
31. Lacey RE, Minnis H. Practitioner review: Twenty years of research with adverse childhood experience scores – Advantages, disadvantages and applications to practice. *J Child Psychol Psychiatry.* 2020;61(2):116-130. doi:10.1111/jcpp.13135
32. McLaughlin KA, Sheridan MA, Lambert HK. Childhood adversity and neural development: Deprivation and threat as distinct dimensions of early experience. *Neurosci Biobehav Rev.* 2014;47:578-591. doi:10.1016/j.neubiorev.2014.10.012
33. Sheridan MA, McLaughlin KA. Neurodevelopmental mechanisms linking ACEs with psychopathology. In: *Adverse Childhood Experiences.* Elsevier; 2020:265-285. doi:10.1016/B978-0-12-816065-7.00013-6
34. Ford DC, Merrick MT, Parks SE, et al. Examination of the factorial structure of adverse childhood experiences and recommendations for three subscale scores. *Psychol Violence.* 2014;4(4):432-444. doi:10.1037/a0037723
35. Lanier P, Maguire-Jack K, Lombardi B, Frey J, Rose RA. Adverse childhood experiences and child health outcomes: comparing cumulative risk and latent class approaches. *Matern Child Health J.* 2018;22(3):288-297. doi:10.1007/s10995-017-2365-1
36. Henry LM, Gracey K, Shaffer A, et al. Comparison of three models of adverse childhood experiences: Associations with child and adolescent internalizing and externalizing symptoms. *J Abnorm Psychol.* 2021;130(1):9-25. doi:10.1037/abn0000644
37. Bethell CD, Carle A, Hudziak J, et al. Methods to assess adverse childhood experiences of children and families: toward approaches to promote child well-being in policy and practice. *Acad Pediatr.* 2017;17(7):S51-S69. doi:10.1016/j.acap.2017.04.161
38. Reuben A, Moffitt TE, Caspi A, et al. Lest we forget: Comparing retrospective and prospective assessments of adverse childhood experiences in the prediction of adult health. *J Child Psychol Psychiatry.* 2016;57(10):1103-1112. doi:10.1111/jcpp.12621
39. Brown DW, Anda RF, Felitti VJ, et al. Adverse childhood experiences are associated with the risk of lung cancer: A prospective cohort study. *BMC Public Health.* 2010;10(1):20. doi:10.1186/1471-2458-10-20

40. Dong M, Giles WH, Felitti VJ, et al. Insights into causal pathways for ischemic heart disease: Adverse childhood experiences study. *Circulation*. 2004;110(13):1761-1766. doi:10.1161/01.CIR.0000143074.54995.7F
41. Dube SR, Anda RF, Felitti VJ, Edwards VJ, Croft JB. Adverse childhood experiences and personal alcohol abuse as an adult. *Addict Behav*. 2002;27(5):713-725. doi:10.1016/S0306-4603(01)00204-0
42. Brown DW, Anda RF, Tiemeier H, et al. Adverse childhood experiences and the risk of premature mortality. *Am J Prev Med*. 2009;37(5):389-396. doi:10.1016/j.amepre.2009.06.021
43. Chapman DP, Whitfield CL, Felitti VJ, Dube SR, Edwards VJ, Anda RF. Adverse childhood experiences and the risk of depressive disorders in adulthood. *J Affect Disord*. 2004;82(2):217-225. doi:10.1016/j.jad.2003.12.013
44. Jones TM, Nurius P, Song C, Fleming CM. Modeling life course pathways from adverse childhood experiences to adult mental health. *Child Abuse Negl*. 2018;80:32-40. doi:10.1016/j.chiabu.2018.03.005
45. Shonkoff JP, Boyce WT, McEwen BS. Neuroscience, molecular biology, and the childhood roots of health disparities: Building a new framework for health promotion and disease prevention. *JAMA*. 2009;301(21):2252. doi:10.1001/jama.2009.754
46. Kendall-Tackett K. The health effects of childhood abuse: Four pathways by which abuse can influence health. *Child Abuse Negl*. 2002;26(6-7):715-729. doi:10.1016/S0145-2134(02)00343-5
47. Hughes K, Bellis MA, Hardcastle KA, et al. The effect of multiple adverse childhood experiences on health: A systematic review and meta-analysis. *Lancet Public Health*. 2017;2(8):e356-e366. doi:10.1016/S2468-2667(17)30118-4
48. Holman DM, Ports KA, Buchanan ND, et al. The association between adverse childhood experiences and risk of cancer in adulthood: A systematic review of the literature. *Pediatrics*. 2016;138(Supplement_1):S81-S91. doi:10.1542/peds.2015-4268L
49. Condon EM, Holland ML, Slade A, Redeker NS, Mayes LC, Sadler LS. Maternal adverse childhood experiences, family strengths, and chronic stress in children. *Nurs Res*. 2019;68(3):189-199. doi:10.1097/NNR.0000000000000349
50. Cooke JE, Racine N, Plamondon A, Tough S, Madigan S. Maternal adverse childhood experiences, attachment style, and mental health: pathways of transmission to child behavior problems. *Child Abuse Negl*. 2019;93:27-37. doi:10.1016/j.chiabu.2019.04.011
51. Sun J, Patel F, Rose-Jacobs R, Frank DA, Black MM, Chilton M. Mothers' adverse childhood experiences and their young children's development. *Am J Prev Med*. 2017;53(6):882-891. doi:10.1016/j.amepre.2017.07.015
52. Plant DT, Pawlby S, Pariante CM, Jones FW. When one childhood meets another – maternal childhood trauma and offspring child psychopathology: a systematic review. *Clin Child Psychol Psychiatry*. 2018;23(3):483-500. doi:10.1177/1359104517742186

53. Schickedanz A, Halfon N, Sastry N, Chung PJ. Parents' adverse childhood experiences and their children's behavioral health problems. *Pediatrics*. 2018;142(2):e20180023. doi:10.1542/peds.2018-0023
54. Schickedanz A, Escarce JJ, Halfon N, Sastry N, Chung PJ. Intergenerational associations between parents' and children's adverse childhood experience scores. *Children*. 2021;8(9):747. doi:10.3390/children8090747
55. Buss C, Entringer S, Moog NK, et al. Intergenerational Transmission of Maternal Childhood Maltreatment Exposure: Implications for Fetal Brain Development. *J Am Acad Child Adolesc Psychiatry*. 2017;56(5):373-382. doi:10.1016/j.jaac.2017.03.001
56. Madigan S, Cyr C, Eirich R, et al. Testing the cycle of maltreatment hypothesis: meta-analytic evidence of the intergenerational transmission of child maltreatment. *Dev Psychopathol*. 2019;31(1):23-51. doi:10.1017/S0954579418001700
57. Baldwin JR, Caspi A, Meehan AJ, et al. Population vs individual prediction of poor health from results of adverse childhood experiences screening. *JAMA Pediatr*. 2021;175(4):385. doi:10.1001/jamapediatrics.2020.5602
58. Kelly-Irving M, Delpierre C. A critique of the adverse childhood experiences framework in epidemiology and public health: Uses and misuses. *Soc Policy Soc*. 2019;18(3):445-456. doi:10.1017/S1474746419000101
59. Alaska Department of Health and Social Services. Adverse childhood experiences: Overcoming ACEs in Alaska. Published online January 2015. Accessed December 28, 2022. <https://health.alaska.gov/abada/ace-ak/documents/acesreportalaska.pdf>
60. Bynum L, Griffin T, Ridings D, et al. Adverse Childhood Experiences Reported by Adults --- Five States, 2009. *Morbidity and Mortality Weekly Report (MMWR)*. 2010;59(49):1609-1613.
61. Alaska Division of Public Health. Alaska health data geographic descriptions: Alaska public health regions. Accessed May 25, 2023. https://health.alaska.gov/dph/Chronic/Pages/Data/geo_phr.aspx
62. ASPE. Prior HHS poverty guidelines and federal register references. Accessed May 25, 2023. <https://aspe.hhs.gov/topics/poverty-economic-mobility/poverty-guidelines/prior-hhs-poverty-guidelines-federal-register-references>
63. Alaska Division of Public Health. Alaska Longitudinal Child Abuse and Neglect Linkage Project (ALCANLink). Published online 2022. Accessed October 21, 2022. <https://health.alaska.gov/dph/wcfh/Pages/mchepi/ALCANLink/default.aspx>
64. CDC. PRAMS methodology. Published online April 22, 2022. Accessed October 17, 2022. <https://www.cdc.gov/prams/methodology.htm>
65. Shulman HB, D'Angelo DV, Harrison L, Smith RA, Warner L. The Pregnancy Risk Assessment Monitoring System (PRAMS): Overview of Design and Methodology. *Am J Public Health*. 2018;108(10):1305-1313. doi:10.2105/AJPH.2018.304563

66. Drake B, Jonson-Reid M, Way I, Chung S. Substantiation and recidivism. *Child Maltreat*. 2003;8(4):248-260. doi:10.1177/1077559503258930
67. Leiter J, Myers KA, Zingraff MT. Substantiated and unsubstantiated cases of child maltreatment: do their consequences differ? *Soc Work Res*. 1994;18(2):67-82. doi:10.1093/swr/18.2.67
68. Hussey JM, Marshall JM, English DJ, et al. Defining maltreatment according to substantiation: distinction without a difference? *Child Abuse Negl*. 2005;29(5):479-492. doi:10.1016/j.chiabu.2003.12.005
69. Data Resource Center for Child & Adolescent Health. The National Survey of Children's Health. Accessed November 30, 2022. <https://www.childhealthdata.org/learn-about-the-nsch/NSCH>
70. Data Resource Center for Child & Adolescent Health. NSCH survey methodology. Accessed November 30, 2022. <https://www.childhealthdata.org/learn-about-the-nsch/methods>
71. Center for Disease Control and Prevention. Behavioral Risk Factor Surveillance System. Published online August 29, 2022. Accessed December 1, 2022. <https://www.cdc.gov/brfss/>
72. Center for Disease Control and Prevention. *Preventing Adverse Childhood Experiences (ACEs): Leveraging the Best Available Evidence*. National Center for Injury Prevention and Control; 2019. Accessed December 29, 2022. <https://www.cdc.gov/violenceprevention/pdf/preventingACES.pdf>
73. Allen D, Abresch C. Confronting adversity: MCH responds to ACEs. *Matern Child Health J*. 2018;22(3):283-287. doi:10.1007/s10995-018-2455-8
74. Rittman D, Parrish J, Lanier P. Prebirth household challenges to predict adverse childhood experiences score by age 3. *Pediatrics*. 2020;146(5):e20201303. doi:10.1542/peds.2020-1303
75. Davis EP, Narayan AJ. Pregnancy as a period of risk, adaptation, and resilience for mothers and infants. *Dev Psychopathol*. 2020;32(5):1625-1639. doi:10.1017/S0954579420001121
76. Rutter M. Psychosocial resilience and protective mechanisms. *Am J Orthopsychiatry*. 1987;57(3):316-331. doi:10.1111/j.1939-0025.1987.tb03541.x
77. Hays-Grudo J, Morris AS. *Adverse and Protective Childhood Experiences: A Developmental Perspective*. American Psychological Association; 2020. doi:10.1037/0000177-000
78. Narayan AJ, Ippen CG, Harris WW, Lieberman AF. Protective factors that buffer against the intergenerational transmission of trauma from mothers to young children: A replication study of angels in the nursery. *Dev Psychopathol*. 2019;31(1):173-187. doi:10.1017/S0954579418001530
79. Narayan AJ, Lieberman AF, Masten AS. Intergenerational transmission and prevention of adverse childhood experiences (ACEs). *Clin Psychol Rev*. 2021;85:101997. doi:10.1016/j.cpr.2021.101997
80. Fortson BL, Klevens J, Merrick MT, Gilbert LK, Alexander SP. *Preventing Child Abuse and Neglect: A Technical Package for Policy, Norm, and Programmatic Activities*. National Center for Injury Prevention and Control, Centers for Disease Control and Prevention; 2016. <https://www.cdc.gov/violenceprevention/pdf/can-prevention-technical-package.pdf>

81. Stone D, Holland K, Holland B, Crosby A, Davis S, Wilkins N. *Preventing Suicide: A Technical Package of Policies, Programs, and Practice*. National Center for Injury Prevention and Control, Division of Violence Prevention; 2017. doi:10.15620/cdc.44275
82. Murray DW, Rosanbalm K, Christopoulos C, Hamoudi A. *Self-Regulation and Toxic Stress Report 1: Foundations for Understanding Self-Regulation from an Applied Perspective*. Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services; 2015. Accessed March 7, 2023. https://www.acf.hhs.gov/sites/default/files/documents/report_1_foundations_paper_final_012715_submitted_508_0.pdf
83. Berger A. *Self-Regulation: Brain, Cognition, and Development*. American Psychological Association; 2011.
84. Moffitt TE, Arseneault L, Belsky D, et al. A gradient of childhood self-control predicts health, wealth, and public safety. *Proc Natl Acad Sci*. 2011;108(7):2693-2698. doi:10.1073/pnas.1010076108
85. Association of Alaska School Boards. Social & Emotional Learning. Accessed January 5, 2023. <https://aasb.org/social-emotional-learning/>
86. Alaska Department of Education & Early Development. Transforming schools: A framework for trauma-engaged practice in Alaska. Published online 2020. Accessed January 5, 2023. <https://education.alaska.gov/apps/traumawebtoolkit/new-framework-page.html>
87. Fishel S, Sanders A, Coulehan H, et al. *Transforming Schools: A Framework for Trauma-Engaged Practice in Alaska.*; 2020. Accessed January 5, 2023. <https://education.alaska.gov/tls/safeschools/pdf/transforming-schools.pdf>
88. Grossman JB, Tierney JP. Does mentoring work?: An impact study of the big brothers big sisters program. *Eval Rev*. 1998;22(3):403-426. doi:10.1177/0193841X9802200304
89. Child Welfare Information Gateway. *Plans of Safe Care for Infants with Prenatal Substance Exposure and Their Families*. U.S. Department of Health and Human Services, Administration for Children and Families, Children's Bureau; 2020. Accessed January 5, 2023. <https://www.childwelfare.gov/pubPDFs/safecare.pdf>
90. The Child Welfare Academy, Pittz Consulting. *Toolkit for Primary Care Providers.*; 2016. Accessed January 5, 2023. https://www.a2p2.org/_files/ugd/e19593_361c639558474834b0fd742440f3b02a.pdf
91. Alaska Mental Health Trust Authority. *Strengthening the System: Alaska's Comprehensive Integrated Mental Health Program Plan.*; 2019. Accessed January 5, 2023. https://health.alaska.gov/Commissioner/Documents/MentalHealth/StrengtheningSystem-CompPlan_2020-24.pdf
92. Haddon W. On the escape of tigers: an ecologic note. *Am J Public Health Nations Health*. 1970;60(12):2229-2234. doi:10.2105/AJPH.60.12.2229-b
93. Haddon W. Options for the prevention of motor vehicle crash injury. *Isr J Med Sci*. 1980;16(1):45-65.

94. Runyan CW. Using the Haddon matrix: introducing the third dimension. *Inj Prev.* 1998;4(4):302-307. doi:10.1136/ip.4.4.302
95. Malik R. *Investing in Infant and Toddler Child Care to Strengthen Working Families.* Center for American Progress; 2019. Accessed January 13, 2023. <https://www.americanprogress.org/wp-content/uploads/2019/10/Infant-Toddler-SIPP.pdf>
96. Maggi S, Irwin LJ, Siddiqi A, Hertzman C. The social determinants of early child development: an overview: early child development. *J Paediatr Child Health.* 2010;46(11):627-635. doi:10.1111/j.1440-1754.2010.01817.x
97. Novoa C, Morrissey T. *Adversity in Early Childhood: The Role of Policy in Creating and Addressing Adverse Childhood Experiences.* Center for American Progress; 2020. Accessed January 13, 2023. <https://www.americanprogress.org/wp-content/uploads/2020/08/EarlyChildhoodAdversity-report.pdf>
98. Amato PR, Keith B. Parental divorce and the well-being of children: A meta-analysis. *Psychol Bull.* 1991;110(1):26-46. doi:10.1037/0033-2909.110.1.26
99. Kline M, Johnston JR, Tschann JM. The long shadow of marital conflict: A model of children's postdivorce adjustment. *J Marriage Fam.* 1991;53(2):297. doi:10.2307/352900
100. Vandewater EA, Lansford JE. Influences of family structure and parental conflict on children's well-being. *Fam Relat.* 1998;47(4):323. doi:10.2307/585263
101. Katz LF, Gottman JM. Buffering children from marital conflict and dissolution. *J Clin Child Psychol.* 1997;26(2):157-171. doi:10.1207/s15374424jccp2602_4
102. Armistead L, Forehand R, Brody G, Maguen S. Parenting and child psychosocial adjustment in single-parent African American families: Is community context important? *Behav Ther.* 2002;33(3):361-375. doi:10.1016/S0005-7894(02)80033-8
103. Dye HL. Is emotional abuse as harmful as physical and/or sexual abuse? *J Child Adolesc Trauma.* 2020;13(4):399-407. doi:10.1007/s40653-019-00292-y
104. Solomon CR, Serres F. Effects of parental verbal aggression on children's self-esteem and school marks. *Child Abuse Negl.* 1999;23(4):339-351. doi:10.1016/S0145-2134(99)00006-X
105. Christ C, de Waal MM, Dekker JJM, et al. Linking childhood emotional abuse and depressive symptoms: The role of emotion dysregulation and interpersonal problems. Seedat S, ed. *PLOS ONE.* 2019;14(2):e0211882. doi:10.1371/journal.pone.0211882
106. Hibbard R, Barlow J, MacMillan H, et al. Psychological maltreatment. *Pediatrics.* 2012;130(2):372-378. doi:10.1542/peds.2012-1552
107. Putnam-Hornstein E, Prindle JJ, Rebbe R. Community disadvantage, family socioeconomic status, and racial/ethnic differences in maltreatment reporting risk during infancy. *Child Abuse Negl.* 2022;130:105446. doi:10.1016/j.chiabu.2021.105446

108. Hill RB. *An Analysis of Racial/Ethnic Disproportionality and Disparity at the National, State, and County Levels*. Annie E. Casey Foundation and Center for the Study of Social Policy; 2007.
<https://www.aecf.org/resources/an-analysis-of-racial-ethnic-disproportionality-and-disparity-at-the-nation>
109. Suh B, Anderson K, Swedo E, Kinkead A, Pagnotto M, Hekman K. NSSP Adverse Childhood Experiences Dashboard. Published online April 25, 2023. <https://knowledgerepository.syndromicsurveillance.org/nssp-adverse-childhood-experiences-dashboard>
110. Amaya-Jackson L, Absher LE, Gerrity ET, Layne CM, Halladay Goldman J. *Beyond the ACE Score: Perspectives from the NCTSN on Child Trauma and Adversity Screening and Impact*. National Center for Child Traumatic Stress; 2021. Accessed January 9, 2023.
<https://www.nctsn.org/sites/default/files/resources/special-resource/beyond-the-ace-score-perspectives-from-the-nctsn-on-child-trauma-and-adversity-screening-and-impact.pdf>
111. Dettlaff AJ, Boyd R. Racial disproportionality and disparities in the child welfare system: Why do they exist, and what can be done to address them? *Ann Am Acad Pol Soc Sci*. 2020;692(1):253-274.
doi:10.1177/0002716220980329
112. Child Welfare Information Gateway. *Child Welfare Practice to Address Racial Disproportionality and Disparity*. U.S. Department of Health and Human Services, Administration for Children and Families, Children's Bureau; 2021. Accessed January 9, 2023.
https://www.childwelfare.gov/pubPDFs/racial_disproportionality.pdf
113. Putnam-Hornstein E, Needell B, King B, Johnson-Motoyama M. Racial and ethnic disparities: A population-based examination of risk factors for involvement with child protective services. *Child Abuse Negl*. 2013;37(1):33-46. doi:10.1016/j.chiabu.2012.08.005
114. Crowell K, Levi BH. Mandated reporting thresholds for community professionals. *Child Welfare*. 2012;91(1):35-53.
115. Parrish JW, Shanahan ME, Schnitzer PG, Lanier P, Daniels JL, Marshall SW. Quantifying sources of bias in longitudinal data linkage studies of child abuse and neglect: measuring impact of outcome specification, linkage error, and partial cohort follow-up. *Inj Epidemiol*. 2017;4(1):23. doi:10.1186/s40621-017-0119-6
116. Parrish JW, Young MB, Perham-Hester KA, Gessner BD. Identifying risk factors for child maltreatment in Alaska. *Am J Prev Med*. 2011;40(6):666-673. doi:10.1016/j.amepre.2011.02.022
117. Rittman D, Baldwin-Johnson C, Parrish J. Dispelling myths about child sexual abuse among Indigenous people. Published online 2019. Accessed October 26, 2022.
<https://health.alaska.gov/dph/wcfh/Documents/mchepi/CSA%20Final%20Draft.pdf>