Statewide Data Profile:
Substance Use and Trauma

Working Draft Report

Substance Abuse Epidemiology Work Group

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Acknowledgements

Table of Contents

List of Tables

List of Figures

Executive Summary

Background:

The Arizona Substance Abuse Partnership (ASAP) tasked its subcommittee, the Substance Abuse Epidemiology Work Group (Epi Work Group), with providing a report on substance use and trauma in Arizona. The goal is to use this information for data-driven decision-making around prevention and treatment programming and policies. The study was to examine Arizona specific data on both substance use and trauma.

Research Questions:

Two research questions were identified which guided the development of this report.

1. What data exist in Arizona to identify the extent of substance use and trauma?

2. What relationships exist between trauma and substance use identified from the data?

Data Sources: The available substance use and trauma data and the identified data gaps are from 16 Arizona agencies/entities of which only four collected both data types. For this report, trauma was measured through questions on Adverse Childhood Experiences (ACE) that for example, ask about living with anyone who used alcohol or drugs, was in jail or prison, adults who beat each other up or cursed at them, or parents who were divorced. Having these experiences in childhood are viewed as traumatic stressors that are associated with risky behaviors and poor health outcomes. The Arizona Department of Health Services (ADHS) provided data from the 2016 Behavioral Risk Factor Surveillance System (BRFSS) and the Arizona Criminal Justice Commission (ACJC) provided data from the 2016 Arizona Youth Survey (AYS). Both surveys asked similar substance use and trauma ACE questions of respondents, which allowed for replication of analyses and comparison of the results across the two datasets at different developmental time points. Data for a third agency, the Arizona Department of Juvenile Corrections (ADJC), were also provided and analyzed, although these data were for a different year and a smaller sub-population. The Office of Sex Trafficking Intervention Research (STIR) also collects both types of data for its target population, but these data were not available for this report.

Results: Only four agencies - ACJC, ADHS, ADJC, and STIR - collected data regarding both substance use and trauma. Data analyses were conducted for the three datasets provided (BRFSS, AYS and ADJC) showing associations between the substance use and ACE findings, with specific comparisons analyzed for the adult BFRSS data and the youth AYS data.

- The results across all three datasets (BRFSS, AYS, and ADJC) showed that the higher ACE scores had a positive association with more substance use. For BRFSS and AYS participants, both 30-day and lifetime substance use showed that while having an ACE score between 1-3 does have a relationship with use rates, having an ACE score of 4 or more showed an even stronger relationship with more substance use.
- Alcohol was the most used 30-day drug for both adults and youth. For those with an ACE score of 4 or more, half of adults and almost two-thirds of youth reported regular 30-day use of alcohol and 15% of adults reported binge drinking in the past 30 days as did 1 in 5 youth. Further, those adults and youth with an ACE score of 4 or more had more days consuming at least one drink, and more days of binge drinking.
- The percentage of adults and youth reporting 30-day illicit drug use if they had an ACE score of 4 or more was double those percentages reported for the total sample, and youth use was over three times higher than adults.

Conclusions and Recommendations:

The conclusions follow from the analyses and findings of BRFSS, AYS, and ADJC substance use and trauma data.

The **gap analysis** was to determine available data in Arizona showed that 12 of the 16 agencies do not collect both substance use and trauma data. Thus, gaps exist in many agency's knowledge about clients and others served who may be dealing with these substantive issues. Each agency should collect both types of data to gain a better understanding of its target group and their needs for services around trauma or through a trauma-informed lens.

Using data specific to Arizona, it was **possible to examine the relationships between substance use and trauma**. This highlights the importance of having both substance use and ACE data available, and using these results for data-driven decision-making on prevention, intervention, and treatment programs and policies specific to subpopulations in need.

Importantly, the findings were consistent across the analyses that both adults and youth with a higher ACE score, especially for those with a score of 4 or more, showed significantly more substance use. The high rates of use for youth, with lifetime rates already above those for adults, foreshadow a continuation of the need for prevention, intervention and treatment programs in order to mitigate substance use and adverse experiences leading to trauma. To be maximally effective, these programs will need to be targeted to subpopulations and culturally responsive. This is critically important as a majority of youth who will become Arizona's adults are of minority backgrounds. Additional subpopulations of concerns include poly-substance users as well as individuals experiencing specific types of trauma. ACE data on these critical subpopulations will certainly be needed to enhance implementation of effective programs and policies that infuse a trauma-informed approach.

Results indicated a significant positive relationship between the higher ACE score and substance use; for both adults and youth. As ACE exposure increased (especially for those with an ACE score of 4 or more), so did the likelihood of engaging in risky substance use behaviors. This gradient relationship suggests causality and the importance of addressing trauma to prevent substance use. Higher ACE scores need to be of great concern given the known tendency to engage in risky substance use behaviors as coping mechanisms for ACE trauma. The findings from the ADJC data reveal the importance of changing youths' risky (and illegal) behaviors and thus, why using knowledge of ACE scores for specific target groups can be a beneficial factor in providing the appropriate trauma-informed services.

Efforts should be continued and expanded on in regards to the data collection, analysis, and reporting for substance use and ACE data for those agencies currently doing so and started for other agencies in the state. Without these data, agencies may be operating without the best information on methods to assist their clients, with particular attention to sub-population(s). Data shared across agencies can also help to identify larger system issues and target populations for integrated services. Resources and mechanisms to support data efforts should be provided so that Arizona prevention and treatment programs and policies can be guided by accurate information about substance use and trauma in the state's population.

Definitions

For purposes of this report, definitions of various operational terms used throughout are provided. Although some of the terminology is common to individuals who work in fields related to substance use and trauma, terms are defined to provide clarity of their use in this report.

ACE – Adverse Childhood Experiences are potentially traumatic events that occur in childhood between the ages of 0 – 17 years. ACE have been linked to chronic health problems, mental illness, substance misuse, and negative impacts on education and job opportunities (Centers for Disease Control and Prevention [CDC], 2019c). Defined in the original research (Felitti et al., 1998) by 10 risk factors, data in this report refer to six items when used in two Arizona surveys, and 10 items for the ADJC survey.

ASAP – The Arizona Substance Abuse Partnership is authorized under Executive Order 2013-05 to serve as the single statewide council on substance abuse prevention, enforcement, treatment, and recovery efforts. The council consists of members appointed by the governor. ASAP initiates and supports improvements in substance abuse policy, develops dynamic partnerships, participates in data-driven planning processes, and assists with coordinator efforts supported by program evaluations (Governor's Office of Youth, Faith and Family, 2020).

Epi Work Group – The Arizona Substance Abuse Epidemiology Work Group (Epi Work Group) is the state name assigned to this committee authorized under Executive Order 2013-05. The official federal name for the group is the State Epidemiology Outcomes Workgroup (SEOW). The Epi Work Group is comprised of members from grant partner agencies, representatives of agencies with key data sets, public health experts, community representatives, and the Governor's Office of Youth, Faith and Family (GOYFF), Strategic Prevention Framework (SPF)/Partnership for Success (PFS) administering agency.

SEOW – The State Epidemiological Outcome Work Group (SEOW) is a formal subcommittee of the Arizona Substance Abuse Partnership (ASAP), and known in the state as the Arizona Substance Abuse Epidemiology Work Group (Epi Work Group). SEOW was formed in 2004 as a requirement of the Partnership for Success (PFS) grant to compile and synthesize information on substance use, assess substance use treatment service capacity in Arizona, and serve as a resource to ASAP to support data-driven decision-making.

Substance Use – "Substance use disorder" is the preferred term in the scientific community. The Diagnostic and Statistical Manual of Mental Disorders (DSM) no longer distinguishes between substance abuse and dependence, but rather defines them along a substance use scale that measures time and degree, with abuse as an early stage of dependence (Juergens, 2020). For this report, the term substance use is used and is inclusive of substance use disorders across the scale from experimentation to levels of abuse and dependence.

Trauma – "Individual trauma results from an event, series of events, or set of circumstances experienced by an individual as physically or emotionally harmful or life-threatening with lasting adverse effects on the individual's functioning and mental, physical, social, emotional, or spiritual well-being" (Substance Abuse and Mental Health Services Administration, 2014, p. 7). In this report, trauma is defined as six Adverse Childhood Experiences (ACE) questions asked on both the Arizona Youth Survey (AYS) and the Behavioral Risk Factor Surveillance System (BRFSS) surveys, and ten questions from the ACE Questionnaire administered by the Arizona Department of Juvenile Corrections.

Background

Over the last 15 years, Arizona has regularly developed substance abuse profiles. These reports have been developed under the auspices of the Arizona Substance Abuse Partnership (ASAP) and the Arizona Substance Abuse Epidemiology Work Group (Epi Work Group.) In 2019, ASAP identified that Arizona does not have an updated statewide data profile and especially a report that examined the relationship of substance use and trauma. Substance use and childhood trauma place individuals at increased risk for high-risk behaviors, comorbidities, and death. ASAP needs this research to aid in its data-based decision-making considering the full-breadth of potential system improvements (Arizona Substance Abuse Partnership Subcommittee, 2019).

In fall 2018, the Governor's Office of Youth, Faith and Family (GOYFF) received a Strategic Prevention Framework Partnerships for Success grant (SPF-PFS) from the Center for Substance Abuse Prevention (CSAP) in the Substance Abuse and Mental Health Services Administration (SAMHSA). This funding was the latest in a series of substance abuse prevention grants, the past three of which have funded both community based projects as well as the Arizona Substance Abuse Epidemiology Work Group (Epi Work Group); the official federal name for the group is the State Epidemiology Outcomes Workgroup (SEOW). The purpose of the SPF-PFS grant program is to prevent the onset and reduce the progression of substance abuse and its related problems while strengthening prevention capacity and infrastructure at the community level. The program aims to address one of the nation's top substance abuse prevention priorities - underage drinking among persons ages nine to 20. Community partner recipients identified through a competitive grant process administered by the GOYFF are required to utilize trauma informed substance abuse prevention activities to address community needs. Grant recipients may also use funds to target up to two additional, data-driven substance abuse prevention priorities, such as the use of marijuana, cocaine, opioids, or methamphetamine, by individuals ages nine and older.

A comprehensive examination of substance use data is a core component and requirement of the SPF-PFS grant and can aid state agencies and community stakeholders in their understanding of community needs, priorities and recommendations where possible. Indeed, developing and utilizing a shared-planning process that encourages state and local partnerships to maximize existing resources and building the capacity of local communities to meet their identified needs is the joint responsibility of Arizona Substance Abuse Partnership (ASAP) and its subcommittee, the Epi Work Group.

Developing a statewide substance use and trauma data profile is a core component of the SPF-PFS grant and was a priority identified by ASAP. Thus, the Epi Work Group compiled this report using primary and secondary data from national and statewide surveys, and direct counts and summary statistics from state agency reports. This information will examine the relationship(s) between substance use and trauma across the state, as well as identify key gaps where further data are needed.

Specifically, this data profile asks two **research questions** to guide the development and analysis of this report:

1. What data exist in Arizona to identify the extent of substance use and trauma?

2. What relationships exist between substance use and trauma as identified from the data?

The report will aid state agencies and community stakeholders in their understanding of community needs in the areas of substance use and trauma as well as inform the statewide profile by

providing data and suggesting priorities and recommendations where possible. The development of an up-to-date substance use and trauma profile report addresses the federal needs assessment requirement while importantly investigating the state-identified need to view possible relationships between substance use and trauma. Overall, this report attempts to bring together the data around multiple variables and factors that are themselves; proxies for or factors related to how substance use and trauma impact individuals, organizations, and systems.

The Epi Work Group assisted in the development of a work plan and parameters for this report. Further, individual members contributed sections from their respective agencies as well from their areas of expertise. Members also reviewed the Statewide Data Profile at its many stages of development. Indeed, one of the parameters that was set was to provide reports to the Epi Work Group and to ASAP on an on-going basis so that there were multiple opportunities for input on direction and conclusions. The report data and analysis were conducted by and under the direction of the Arizona Criminal Justice Commission (ACJC) with support from its subcontractor, ASU SIRC (Arizona State University, Southwest Interdisciplinary Research Center).

Literature Review

Substance Use

Substance use is a critical public health issue in Arizona and in the United States. Investing in proactive solutions are essential to mitigate human suffering, social problems, and financial costs of substance use. Focused efforts to decrease risky behavior such as alcohol, tobacco, and drug use in adolescents are critical, as data show concerning substance use rates among adolescents. Nationally, 16% of adolescents, ages 12 to 17 reported illicit drug use during 2017, and more than 31% of adolescents endorsed use of tobacco or alcohol during the same timeframe (Substance Abuse and Mental Health Services Administration [SAMHSA], 2018). During 2017, nationally, 4% of 12 to 17 year olds met criteria for a substance use disorder, with 82.5% of these adolescents not receiving care (SAMHSA, 2018). Substance use negatively affects how well children and adolescents can learn, and there is a need to identify students at-risk and connect them with appropriate prevention and treatment services. Supporting Arizona schools with drug education and resources can go a long way toward addressing early substance use and developing a positive school culture. Early prevention and intervention efforts improve outcomes; therefore, it is essential to educate youth before and during these years to prevent drug and alcohol use.

Arizona reported staggering statistics when it comes to opioid abuse. In 2016, more than two Arizonans died each day due to opioid-related causes (Arizona Department of Health Services [ADHS], 2017). The following year in 2017, ADHS reported that 949 people in Arizona died of an opioid-caused overdose, which is 20.1% higher than 2016 (ADHS, 2017). Hospital data indicated that in 2017 there were 51,473 unique opioid-related encounters in Arizona hospitals, totaling an estimated $431 million in healthcare costs (ADHS, 2017).

ACE Trauma

Biological impact of trauma. Adverse childhood experiences (ACE) are stressful or traumatic events in early childhood that have been associated with ongoing physical and social problems in adolescence and adulthood (Felitti et al., 1998; Jonson-Reid, Kohl, & Drake, 2012; SAMHSA, 2018). ACE and developmental complex trauma are particularly negative stressful events. Stress is the process of perceiving, understanding, and then reacting to challenging events (Sinha, 2008). The experience of an ACE, complex trauma, or stress causes an adaptive physiological response in the body as an attempt to regain homeostasis or a way to reduce stress in a "fight or flight" mode (Cohen, Kessler, & Gordon, 1997; McEwen, 2007). This attempt at homeostasis is a normal cognitive and behavioral response. However, in the face of persistent and early life stress (such as an ACE), particular reward pathways in the brain (such as the hypothalamic-pituitary-adrenal (HPA) axis) become dysregulated and do not function normally. Human studies document a relationship between the neurobiological effects of child maltreatment and changes in the size and volume of areas of the brain associated with addiction, such as the prefrontal, thalamic, and cerebellar regions (De Bellis, 2002; De Bellis, Narasimhan, Thatcher, Keshavan, Soloff, & Clark, 2005).

The seminal work of Felitti et al. (1998) in the original ACE study demonstrated that retrospective report of ACE in the first 18 years of life was related to a broad range of negative outcomes in adulthood including smoking, depression, and suicidality. These findings have been replicated numerous times and extended to outcomes such as prescription drug use (Anda, Brown, Dube, Felitti, & Giles, 2008) and intimate partner violence (Whitefield, Anda, Dube, & Felitti, 2003). The

ACE pyramid (CDC, 2020) suggests that the adoption of health-risk behaviors is likely an intermediary in the connection among ACE and disease and disability. For example, research has found evidence for a gradient relationship between ACE and high-risk behaviors including early adolescent (<14) initiation of illicit drug use (Dube, Felitti, & Dong, 2003), smoking (Anda et al., 1999), and drinking alcohol (Dube et al., 2006).

Types of trauma. Research also supports the intergenerational transmission of substance use, which represents both a risk factor and a catalyst for child abuse as well as other ACE (Chassin, Pitts, DeLucia, & Todd, 1999; Bailey, Hill, Oesterle, & Hawkins, 2006). Other studies indicated that one of the leading risk factors for child abuse is parental substance use (Chaffin, Kelleher, & Hollenberg, 1996; Kotch, Brown, Dufort, Winsor & Catellier, 1999; Walsh, MacMillan, & Jamieson, 2003; Widom, Marmorstein, & White, 2006). In Arizona, 49.5% of child abuse victims had parents who used drugs and 13.8% had parents who had an alcohol problem (CDC, 2018). Additionally, victims of ACE are more likely to engage in substance use, with a greater risk for youth experiencing multiple types of victimization (e.g., child abuse, relationship violence) (Tyler & Melander, 2015). Some studies suggest that 19-26% of children experiencing child abuse will develop a substance use problem (Brown & Lopez, 2013). Particularly concerning is the high polysubstance use identified in this population (Shin, Hong, & Hazen, 2010). This most likely represents a way to cope by self-medicating to reduce post-traumatic stress symptoms such as intrusion, arousal, numbing, and avoidance (Stewart, Pihl, Conrad, & Dongier, 1998; Mandavia, Robinson, Bradley, Ressler, & Powers, 2016). While it is difficult to disentangle co-occurring family risk factors such as poverty, studies that have rigorously controlled for these have found that parental substance use may mediate the intergenerational transfer of child abuse (Appleyard, Berlin, Rosanbalm, & Dodge, 2011).

A wide body of research indicates that mental health problems such as depression and anxiety are often present with substance use (Grant et al., 2004). The emotional regulation difficulties that result from child abuse or other ACE may explain the underlying mechanisms for these co-occurring mental illnesses (Mandavia et al., 2016). Thus, an important intervention strategy may be improving family modeling and coaching around emotion labeling, expression, and coping (Loukas & Roalson, 2006; Lindstrom Johnson, Finigan, Bradshaw, Haynie, & Cheng, 2013). This may be particularly critical as emotional regulation difficulties in substance using mothers are related to increased child abuse potential, beyond mental health diagnoses (Hien, Cohen, Caldeira, Flom, & Wasserman, 2010).

Results from the National Survey of Children's Exposure to Violence indicate that 42.6% of children ages 14–17 have witnessed violence and 20.6% have been the victims of maltreatment by a caregiver in the past year (Finkelhor, Turner, Shattuck, & Hamby, 2015). Children who are exposed to violence are at greater risk for further victimization and involvement with the child welfare and juvenile justice systems (Finkelhor, Turner, Ormrad, Hambry, & Kracke, 2009; Baglivio & Epps, 2016). Further, this exposure has harmful effects at the genetic and cellular level, impacting life-long health (Moffitt & Klaus-Grawe 2012; Think Tank, 2013). Exposure to violence also impacts child mental health outcomes, increasing vulnerability to substance use behaviors (Brumley, Jaffe, & Brumley, 2017), which interferes with learning (Margolin & Gordis, 2000; Romano, Babchisihin, Marquis, & Fréchette, 2015).

Similar to ACE, complex and developmental trauma is the experience of particularly chronic and prolonged traumatic events, often interpersonal in nature and beginning early in life (Van-der-Kolk, 2017). Because trauma has pervasive, negative impacts at the personal, community, and societal level, multiple professional organizations have formally requested to include trauma-informed practices in public health agendas and activities, such as in schools, disease treatment, intimate partner

relationships, and social policy (Machtinger, Cuca, Khanna, Rose, & Kimberg, 2015; Bowen, & Murshid, 2016; Machtinger, Magruder, Kassam-Adams, Thoresen, & Olff, 2016; Taft, Murphy, & Creech, 2016; Martin et al., 2017).

Of particular interest for inclusion in the Statewide Data Profile was the determination of what information there was in Arizona regarding traumatic experiences, especially for populations and sub-groups. National data, such as those from the KIDS COUNT center (The Annie E. Casey Foundation, 2020) showed that in 2016-2017, 20% of youth experienced two or more ACE compared to 27% of Arizona youth. Thus in Arizona, more youth experienced stressful or traumatic events in early childhood (including abuse and neglect) than did children nationally. This tendency has pushed Arizona agencies to request this report on the Arizona data and data gaps on trauma and its relationships to other factors, especially substance use.

Linkages of Substance Use and Trauma

Ecological Model. Ecodevelopmental theory is a useful approach to examine health-related behaviors because it focuses on the multiple, interacting social contexts that influence adolescent development (Story, Neumark-Sztainer, & French, 2002; Castro, Shaibi, & Boehm-Smith, 2009). Further, ecodevelopmental theory suggests that parents play a primary role in the socialization of youth and directly influence youth across other microsystems (Fredricks & Simpkins, 2012), settings in which the youth participates directly (e.g., parents, peers, neighborhoods).

Many family-related factors have a bearing on adolescent health behaviors including connectedness, cohesion, support, parent-child communication, attachment, modeling, involvement, support of family meals, and monitoring (Li, Stanton, & Feigelman, 2000; Ramirez, Crano, Quist, Burgoon, Alvaro, & Grandpre, 2004; Macaulay, Griffin, Gronewold, Williams, & Botvin, 2005; Pokhrel, Unger, Wagner, Ritt-Olson, & Sussman, 2008; Couch, Glanz, Zhou, Sallis, & Saelens, 2014;). Families also reflect socioeconomic assets and resources that influence housing, school, and neighborhood characteristics (Kumanyika, Taylor, Grier, Lassiter, Lancaster, Morssink, & Renzaho, 2012; Braveman, & Gottlieb, 2014). Knowledge of these interactions helps identify strategies for improving family functioning, parenting skills, and the home environment as a means to strengthen adolescent health behaviors and reduce biological vulnerability (Pantin, 2003, 2009). Broader implications of ecodevelopmental theory for prevention efforts in communities emerge through attention to the macrosystem, which allows for the addition of a concentrated focus on sociopolitical context, history and culture. Macrosystems consist of broad social structures and forces that influence parents and youth (e.g., cultural processes, socioeconomic inequality), systems which interact to influence youth's health behaviors and biological vulnerability (Szapocznik & Coatsworth, 1999, Perrino, González-Soldevilla, Pantin, & Szapocznik, 2000; Coatsworth, Pantin & Szapocznik, 2002; Story et al., 2002; Hovell, Wahlgren, & Adams, 2009). Positive support within and between these systems facilitates positive health outcomes, while conflict within or among them increases vulnerability to risky health behaviors.

Thus, the ecodevelopmental theory also provides system-wide approaches for investigating risk and resiliency, as these models can account for important cultural factors influencing health behaviors. Further, when examining social and cultural determinants of health as fundamental causes of disease (Phelan & Link, 2005), the consideration of social determinants of health becomes important in order to describe how the "factors affect access to care and health care utilization as well as outcomes" (James, 2019, para. 2) These additional needs help to define many of the factors impacting health in the micro

and macro systems, such as food insecurity and housing instability that can be risk factors across multiple levels.

Risk and Protective Factors: Research-Based Predictors of Problem Behaviors and Positive Youth Outcomes. Experimenting and risk-taking are part of adolescent life and a significant number of youth continue to engage in behaviors that place them at risk (CDC, 2020). Risk factors are defined as variables that increase the probability of an undesirable outcome or the likelihood of engaging in problem behaviors, whereas protective factors decrease the likelihood of risky behaviors and increase the probability of desirable behaviors and outcomes (Hawkins et al., 1992; Kraemer et al., 1997). Protective factors are factors that reduce the likelihood of problem behavior either directly or by buffering children from abuse and can help by encouraging them to take the positive steps that strengthen healthy development and decrease probabilities for negative behavior (Masten & Coatsworth, 1998).

The Risk and Protective Factor (RPF) framework is a prevention tool used to assess specific risk in adolescents by looking at the social factors that may increase or decrease the risk of a behavior (Hawkins et al 1992). Developed in the early 1990's by Hawkins, Catalano, and Miller, the RPF model categorizes these social factors into four domains: *(1) individual/peer, (2) family, (3) school, and (4) community* (Hawkins et al., 1992). Each domain contains a set of risk and protective factors that youth may experience. Risk factors have been shown in multiple longitudinal studies to be reliable predictors of adolescent health and social problems including, alcohol and other drug use, antisocial behavior, youth violence, school failure, anxiety/depression, and teenage pregnancy (Arthur et al., 2002).

Understanding Risk and Protective Factors. Understanding and identifying risk and protective factors helps communities understand what they should do to prevent problem behaviors and promote healthy development. Investigation of the predictors of youth problem behaviors is important for efforts to prevent these problems before they occur and to reduce the severity of these problems (Choi, Harachi, Gillmore, & Catalano, 2005). Risk factors include concepts such as youth perceiving no risk in using drugs, having high family conflict, having low commitment to their school, or perceiving that drugs are easily obtainable. Youth with numerous risk factors have particularly elevated chances of participating in antisocial behaviors. (See Figure 1 for a full list of risk factors and protective factors by domain). Protective factors include concepts such as youth interacting with pro-social peers, having a strong attachment to their family, having opportunities for pro social involvement, or receiving rewards for pro-social involvement. Youth with numerous protective factors have particularly lower chances of participating in antisocial behaviors (Hawkins et al., 1992).

Risk and protective factors exist in all areas of children's lives, meaning they exist in all domains for social development and these factors can overlap and influence one another. Targeting only one context when addressing a person's risk or protective factors is unlikely to be successful. These risk and protective factors are often cumulative, with a greater number of risk factors present increasing risk, and a greater number of protective factors decreasing it (Fraser, Galinksy & Richman, 1999; Lösel & Farrington, 2012). People with some risk factors have a greater chance of experiencing even more risk factors and tend to have a cumulative effect on the development of behavioral health issues (Arthur et al., 2002). Young people with multiple protective factors are at a reduced risk, however, young people with multiple risk factors have a greater likelihood of developing a condition that impacts their physical or mental health (Arthur et al., 2002). Risk and protective factors can be present across development and consistent across races and cultures (Choi et al., 2005). Moreover, common risk and protective

factors predict diverse problem behaviors. For some youth, involvement in these risky adolescent behaviors persists and results in multiple negative outcomes throughout their lifespan. The multiple life-course conditions that influence whether an individual will develop a serious problem with substances are in many cases preventable. The more it is understood how risk and protective factors interact, the better prepared everyone is to develop appropriate interventions. The growing recognition of protective factors as a critical aspect of work with youth is long overdue. A strengths-based approach focusing on families' strengths can be very powerful. Especially for individuals with high ACE scores, protective factors may buffer the effects of risk on future negative outcomes (Lösel & Farrington, 2012; Pusch, 2019).

Figure 1: Risk and Protective Factors

Risk Factors	Domain	Protective Factors
¤ Community Laws & Norms Favorable Toward Drug Use, Firearms & Crime ¤ Perceived Availability of Drugs ¤ Transitions & Mobility ¤ Low Community Attachment ¤ Community Disorganization ¤ Economic Disadvantage	Community	✓ Opportunities for prosocial involvement in the community ✓ Recognition of prosocial involvement ✓ Exposure to evidence-based programs and strategies
¤ Poor family management and discipline ¤ Family conflict ¤ A family history of antisocial behavior ¤ Favorable parental attitudes to the problem behavior	Family	✓ Attachment and bonding to family ✓ Opportunities for prosocial involvement in the family ✓ Recognition of prosocial involvement
¤ Academic failure (low academic achievement) ¤ Low commitment to school ¤ Bullying	School	✓ Opportunities for prosocial involvement in school ✓ Recognition of prosocial involvement
¤ Rebelliousness ¤ Early initiation of problem behavior ¤ Impulsiveness and sensation seeking ¤ Antisocial behavior ¤ Favorable attitudes toward problem behavior ¤ Interaction with friends involved in problem behavior ¤ Rewards for antisocial involvement	Individual	✓ Social skills ✓ Belief in the moral order ✓ Emotional control ✓ Interaction with prosocial peers

Methodology

In the spring of 2019, the Epi Work Group discussed the ASAP identified need for a comprehensive statewide data profile examining substance use and trauma. Discussions ensued on definitions of trauma, types of substance use, and possible influences related to both such as risk and protective factors and social determinants of health. Also identified was that some state agencies as well as some federal and private sector entities might be possible sources of data on substance use and trauma. The Epi members realized that agencies might collect or house relevant data. These agencies' data might not be for the same population group or year, may not be defined the same way as other agencies, may be documented only in case notes, not organized in databases for easy retrieval, or may be in need of data sharing agreements (DSAs) to be analyzed across agencies. Thus, it was determined that this profile would include 1) an identification of available data and data gaps on substance use and trauma, and 2) an analysis of similar data on substance use and trauma where possible across data sources.

Identification of Data Gaps

The Epi Work Group identified 16 agencies/entities which potentially had data on substance use and trauma. Members thought that these agencies/entities were the most likely candidates to collect data on children, young adults, and/or adults in one or both areas of interest, and that data from these agencies/entities could be accessible to the Epi Work Group through well-established working relationships and partnerships using data sharing agreements. Following is a list of the 16 agencies/entities contacted regarding data collected on substance use and trauma:

1. Administrative Office of the Courts, Adult Probation Services Division (AOC APSD)
2. Administrative Office of the Courts, Juvenile Justice Services Division (AOC, JJSD)
3. Administrative Office of the Courts, Dependent Children Services Division (AOC, DCSD)
4. Arizona Criminal Justice Commission (ACJC)
5. Arizona Department of Child Safety (ADCS)
6. Arizona Department of Corrections, Rehabilitation and Reentry (ADCRR)
7. Arizona Department of Health Services (ADHS)
8. Arizona Department of Juvenile Corrections (ADJC)
9. Arizona Department of Veterans Administration (ADVA)
10. Arizona Heath Care Cost Containment System (AHCCCS)
11. Bureau of Justice Statistics (BJS)
12. First Things First (FTF)
13. Health Resources and Services Administration, Maternal and Child Health Bureau (HRSA, MCHB)
14. Indian Health Services (IHS)
15. Office of Sex Trafficking Intervention Research (STIR)
16. Regional Behavioral Health Authority (RBHA)

Working together, Epi Work Group members, along with the ACJC and SIRC research team, contacted the agencies/entities over a nine-month timeframe (July 2019 to March 2020). All agencies/entities provided information on the existing data and which could be shared. The results of this effort led to the identification of data gaps as well as the analysis of some of the databases with both substance use and trauma data.

Design of Substance Use and Trauma Data Analysis

Two Arizona datasets were identified that each had data on substance use and trauma. In 2016, both the Behavioral Risk Factor Surveillance System (BRFSS) and the Arizona Youth Survey (AYS) had collected primary data and were selected for analysis based on the similarity of their purposes, availability, and associated variables. The research team determined which variables were similar on the two instruments noting the corresponding measures (see Appendix A for a list of the identified variables). Data sharing agreements were instituted with ADHS for BRFSS and with ACJC for AYS data.

In order to conduct an in-depth analysis, a table listing the variables from both the 2016 BRFSS and AYS surveys was developed in order to select the similar variables for comparison. Similar sociodemographic items were selected for both youth and adults, as were substance use and trauma items. Survey questions on substance use look at how much and how often participants consume alcohol, tobacco, and illicit drugs, and are the dependent variables for this study. The independent variable analyzed was the ACE score using participants' responses to the six different ACE conditions asked as similar questions across the two surveys; this became the working definition for trauma. The research team created three subgroups based on the total ACE score: 1) those who had a zero score; 2) those who scored between one and three; and 3) those participants who scored a four or higher. The total ACE score was based on all six ACE items. ACE cut off scores were matched similarly to the seminal work of Felitti et al. (1998) which examined scores individually by ACE scores of 0, 1, 2, 3, and 4 or more. A list of these measures is provided in Appendix B.

After the review of the data similarities across the two surveys, the most optimal method for data analysis was determined (see Appendix C for Data Analysis Plan). To understand the characteristics of the BRFSS and AYS populations, descriptive statistics were used to illustrate participant demographics. Frequency counts were used to examine the participants' reported gender, race, and education level. To understand the extent to which ACE and substance use outcomes are related, Ordinary Least Squares (OLS) regression models were conducted to measure the association of ACE scores and 30-day substance use outcomes. Lastly, in order to have a comprehensive understanding of the relationship between ACE scores and substance use, logistic regression models were conducted to describe how the number of reported ACE might affect the binary (yes/no) probability of using substances (ACE score and substance use outcomes). Furthermore, correlations among the outcome variables were explored, controlling for sociodemographic factors including gender, race, education, and age.

An additional third data set from the Arizona Department of Juvenile Corrections (ADJC) was analyzed. In December 2018, the ADJC began administering the Adverse Childhood Experiences (ACE) Questionnaire to all incoming juveniles. The ACE Questionnaire is coupled with the Substance Use Disorder (SUD) Classification tool in order to develop a case plan appropriate for the juveniles' age, risk, needs, abilities, and the offense committed. These data were collected between December 2018 and April 2020.

Data Sources

The **Behavioral Risk Factor Surveillance System (BRFSS)** is a national system of health-related telephone surveys coordinated by the Centers for Disease Control and Prevention (CDC). States collect BRFSS data via a telephone survey to help them establish and track state and local health objectives, plan health programs, implement disease prevention and health promotion activities, and monitor trends around chronic health conditions and the use of preventive services (CDC, 2019b). The

questionnaire has three parts: 1) the core component, consisting of the fixed core, rotating core, and emerging core, 2) optional modules, and 3) state-added questions. The fixed core is a standard set of questions asked by all states that includes questions on demographic characteristics, plus queries on current health behaviors, such as tobacco use and seatbelt use.

In Arizona, the BRFSS is managed through the Arizona Department of Health Services (ADHS) which collects data from randomly-selected Arizona adults aged 18 and over living at home. In 2016, optional questions were added regarding ACE score to identify stressful or traumatic events in early childhood that have been associated with ongoing physical and social problems in adolescence and adulthood. Among the 10,952 eligible survey respondents in Arizona, 5,328 adults (48.65%) completed the ACE questionnaire portion of the phone interview.

The BRFSS ACE questions were adapted from those in the original ACE study (Felitti et al., 1998) but do not include questions pertaining to neglect. Furthermore, the BRFSS uses a complex sampling design and in 2011, new weighting methodology—raking, or iterative proportional fitting—replaced the post stratification weighting method that had been used with previous BRFSS data sets. In addition to age, gender, and race/ethnicity, raking permits more demographic variables to be included in weighting such as education attainment, marital status, tenure (property ownership), and telephone ownership to adjust for nonresponse and non-coverage biases (CDC, 2019b).

The **Arizona Youth Survey (AYS)** is completed every two years (even years) by 8th, 10th, and 12th grade students throughout all 15 counties in Arizona. It surveys Arizona students on risk and protective factors that affect the healthy development of children and adolescents and is designed to assess the prevalence and frequency of youth substance use and other risky behaviors in Arizona. All schools in Arizona are eligible to participate in the AYS and efforts are made to ensure that data collected are representative of students across the state.

The AYS is based on the nationally recognized Risk and Protective Factor model included in the Communities That Care (CTC) system (Glaser, Van Horn, Arthur, Hawkins, & Catalano, 2005) that helps communities collect data by focusing on both risk and protective factors to create a community profile promoting positive youth development and preventing problem behaviors (Hawkins et al., 1992). The CTC provides communities with a structured approach for using scientific evidence and local knowledge to choose and implement tested and effective programs that address community-specific needs (Shapiro, Oesterle, & Hawkins, 2015).

In 2016, the AYS was administered between February and May, with both paper and online modes used to allow flexibility for schools with limited student computer access. The 2016 AYS survey resulted in the participation of 57,170 students acquired from 249 schools across the 15 counties. Students answered questions related to the frequency, use and attitudes toward alcohol, cigarettes, electronic cigarettes, marijuana, hallucinogens, ecstasy, methamphetamines, steroids, cocaine, prescription pain relievers, inhalants, synthetic drugs, and over-the counter drugs. That year, the AYS added a six-question adaptation of the ACE Questionnaire to explore childhood experiences of toxic stress. AYS data are made available to the public through the Community Data Project and administered by the Arizona Criminal Justice Commission (ACJC) via funds appropriated by the Arizona Legislature to comply with Arizona Revised Statute § 41-2416. In addition to the data being accessible to the public, AYS data are rich with Arizona adolescent information not collected elsewhere.

The Arizona Department of Juvenile Corrections (ADJC) collects complete ACE and substance use data (SUD) on incarcerated juveniles; these data are collected manually, and limited information from

these instruments are entered into ADJC's database. The **ACE Questionnaire** utilized by the ADJC is comprised of 10 risk factors defined in the original research of Felitti, et al., (1998), which focuses on potentially traumatic events that occurred in the juvenile's life between the ages of zero to 17 years. The ACE Questionnaire is comprised of questions related to physical, mental, and sexual abuse, substance use, love, separation/divorce, incarceration, depression, and mental illness. The **SUD Classification tool** is centered on the juvenile's history of substance use with three substance use levels (SL) used to determine classification: SL1, SL2, and SL3, with SL1 being the highest. The SUD Classification tool is comprised of statements related to substance use disorders, offending and substance use traits, life- or health- threatening traits, and mental health traits.

Results

Data Gaps

In order to identify the substance use and trauma data that existed in Arizona, 16 agencies/entities were contacted for input. All the agencies provided information on their data or lack thereof. This allowed the research team to identify data that could be analyzed and data gaps that exist in Arizona. Some agencies provided detailed information regarding the data their agency collects, while others provided limited information. The following summary provides the information gathered from each agency.

Administrative Office of the Courts (AOC), Adult Probation Services Division (APSD). The AOC, APSD does not collect information on adult probationers' experiences of childhood traumatic or adverse events (K. Waters, personal communication, June 19, 2019). The APSD does collect information regarding substance use utilizing the ASUS-R (Adult Substance Use Survey-Revised); these data are housed in the Adult Probation Enterprise Tracking System (APETS). It is unknown if individual probation departments collect data on trauma.

Administrative Office of the Courts, Juvenile Justice Services Division (JJSD). The AOC, JJSD does not collect information on juvenile probationers' experiences of childhood traumatic or adverse events (J. Kelroy, personal communication, June 19, 2019). The JJSD collects minimal information regarding substance use utilizing the AZYAS (Arizona Youth Assessment Survey); these data are housed in the Juvenile Online Tracking System (JOLTSaz). It is unknown if individual county probation departments collect data on complex trauma.

Administrative Office of the Courts, Dependent Children's Services Division (AOC, DCSD). While the AOC, DCS does collect data on dependent children, their data collection is focused primarily on court hearings, compliance with statutory guidelines, and court rules. While allegations contained in a dependency petition filed by DCS may refer to trauma experienced by a child, specific information is not always available to those completing data entry into the juvenile court data tracking system. In addition, while some county courts may track information on parental substance use in dependency cases, there is not a standardized way to enter such information into the statewide juvenile court data tracking system (A. Henry, personal communication, September 14, 2019).

Arizona Criminal Justice Commission (ACJC). ACJC administers the **Arizona Youth Survey** every two years to those schools/districts that are randomly selected and/or choose to opt-in to this statewide survey of 8th, 10th, and 12th graders. It asks questions on many individual, family, school, and community risk and protective factors, substance use and some ACE questions; the ACE questions were not asked in the 2018 administration. ACJC has conducted analyses for this report and makes the dataset available to researchers as needed. An analysis of 2016 data is included in this report.

Arizona Department of Child Safety (ADCS). The ADCS collects data on the number of clients under 18 years of age that have been referred to Arizona Families FIRST program to help parenting teens in the custody of the ADCS address substance use issues affecting their ability to care appropriately for their children, or to get and keep a job. The ADCS does not collect data on ACE (C. Hasenberg, personal communication, September 3, 2019).

Arizona Department of Corrections, Rehabilitation and Reentry (ADOCRR). The ADOCRR does not collect any information from inmates on inmates' experience of childhood traumatic or adverse events. ADOCRR has no history of data collection of this type (J. Riggs, personal communication, July 11, 2019); however, data are collected on substance use.

Arizona Department of Health Services (ADHS). The ADHS finalized the 2019 Arizona State Health Assessment that provides an assessment of key data to help set public health priorities. This assessment presents both primary and secondary data from multiple sources that involve child and adolescent health topics including Adverse Childhood Experiences (reported from the National Survey of Children's Health) and adolescent substance use, as well as adult data on behavioral risk factors including substance use. ADHS itself collects an abundance of substance use hospital discharge data that are regularly reported. Measurement of specific drugs can be problematic unless there are defined ICD10-CM codes for the drugs in question (S. R. Bailey, personal communication, June 24 & 26, 2019).

ADHS has some internal data summaries for each year which assess particular drugs in terms of counts, crude rates, costs, and burden upon the healthcare systems of Arizona. The summaries cover those which are based upon dependency (addictions and addiction associated diagnoses), those that are based upon non-addictive abuse, but which are not poisonings (overdoses), those that are based upon poisonings (overdoses), and those which do not fit into any of the prior three categories. Further, the data are provided for Death events, Hospital Admission events, Emergency Department Admission events, and Unique events. A collection of those summaries for 2009-2018 were under review when this request was made. In the meantime, a list of the tables is provided for review (see Appendix D) (ADHS, 2019). ADHS does have tables within these summaries on substance use data on teens and young adults that provide age-stratified descriptive statistics in 10-year age categories; from these tables it is possible to derive crude or adjusted rates.

Trauma data from ADHS is a much more obscure issue for two reasons. First, only a few of the ADHS data collection tools ask specifically about trauma. Second, the definitions of ACE can often be obscure and hard to measure in the data. Defining the issues will become a much more recognized challenge, as was the case with opioids in 2015 and 2016. The definitions and measurements must be established by consensus before assessment of ACE can really be effective and results reliable. Some traumatic events - deaths, divorces, domestic violence events - may be quantifiable, and ADHS does collect many of these data; however, the mere number of events does not equal a measurement of the number of children in whose lives those constitute ACE. Other instruments, which seem more directly relevant to ACE, such as the Youth Risk Behavior Surveillance System (YRBSS), have only recently been taken over by the ADHS, and the content of such survey tools are largely controlled by the CDC. While not asking the exact 'official' ACE or trauma questions, the YRBSS does examine issues such as high school students who reported being physically forced to have sexual intercourse.

A brief review of the **YRBSS** data was conducted. ADHS does not yet have access to the CDC website which will provide the dataset for spring 2019 data and all prior years. ADHS was supposed to have data in July; however, data have not yet been released from the federal government. The Epi Workgroup will pursue this data through a data sharing agreement (S. Martinez, personal communication, August 28, 2019). ADHS may also be able to provide YRBSS data as they become available.

ADHS has provided the **Behavioral Risk Factor Surveillance System** (**BRFSS)** data file and has signed a data sharing agreement for use of those data. The purpose of this study and the use of these

data are described in more detail in other sections. Internally, ADHS is just beginning a process of assessing ACE, and is in the midst of an agency-wide collaboration to define project objectives and methods regarding trauma and trauma informed care. That process is not complete and the needed time and staffing capacity are not yet in place for this process. Therefore, ADHS is not able to provide a complete response to inquiries on measurement of trauma at this time.

Arizona Department of Juvenile Corrections (ADJC). The ADJC administers the Adverse Childhood Experiences (ACE) Questionnaire to all juveniles, as well as the Trauma Symptom Checklist for Children (TSCC) and the Substance Abuse Subtle Screening (SASSI) (D. Jones, personal communication, July 11, 2019). Some of the data from all three assessments are entered into ADJC's case management system; however, the information is currently available for a very small sample size of juveniles and is not representative of the population of ADJC juveniles. Per a data sharing agreement, the ADJC provided a dataset for analysis that included variables from the Adverse Childhood Experiences Questionnaire and the Substance Use Disorder Classification instrument from 2018, 2019 and 2020[1].

Arizona Health Care Cost Containment System (AHCCCS). AHCCCS collects data regarding substance use as coded by diagnosis and procedure codes for service utilization (A. Aguayo, personal communication, June 20 & July 11, 2019). AHCCCS does publish substance use reports based on data for the Substance Abuse Block Grant Program (SABG) and for the legislature every year. Data collected are at the member and provider level. The latest report, September 2018, was written in partnership with an outside agency, LeCroy & Milligan Associates. The overall purpose of the needs assessment was to explore the following four main questions:
1.   What are the current substance use issues in Arizona by region and subpopulation?
2.   What substance use prevention programs are active in Arizona?
3.   What are the causes for using and/or abusing substances in Arizona?
4.   What are the recommendations for the future of substance use prevention in Arizona?

Some of AHCCCS' managed care organizations are also known as the Regional Behavioral Health Authorities (RHBAs) and include Arizona Complete Health, which serves southern Arizona, Mercy Care that serves central Arizona, and Steward Health Choice Arizona that serves northern Arizona. AHCCCS requires certain data to be collected for them. The RBHAs, however, collect other data that are not reported to AHCCCS which could include ACE data. AHCCCS would like to be able to collect more data on evidence-based interventions through their system. The five-year Targeted Investment Program at AHCCCS helps to integrate physical health and behavioral health for qualified patients in Arizona. Information on ACE and social determinants of health is collected by the nearly 500 sites using a variety of instruments, and data are for use by the site or organization and not compiled by AHCCCS (G. Jacobson, personal communication, July 16, 2019).

Arizona Department of Veterans Administration (ADVA). Contact with the ADVA was made, however, data pertaining to veterans were not shared.

Bureau of Justice Statistics (BJS). The Bureau of Justice Statistics reports on drug use and substance use disorder, which is reported at the national-level and not the state level. BJS currently does not report on data related to experiences with trauma.

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[1] The data set date range provided by the ADJC was December 2018 (ADJC began using the ACE questionnaire) through mid-April 2020 (time data were queried).

First Things First (FTF). A meeting with the CEO of First Things First was held on September 5, 2019. A meeting was held with the Research Director of FTF in January 2020 to discuss specifically which data were collected related to substance use and/or trauma (R. Iyer, personal communication, December 12, 2019). It remains unclear to what extent FTF collects data related to substance use and/or trauma. There may be the possibility that some partners of FTF collect ACE or similar data. In late 2020, it may be possible that FTF is able to share aggregated data.

Health Resources and Services Administration, Maternal and Child Health Bureau. SIRC evaluators downloaded results from the 2016 National Survey of Child Health (NSCH) online data showing ACE questions and responses for Arizona. The NSCH does not collect drug related data. See Appendix E for a listing of the questions.

Indian Health Services, Phoenix Indian Medical Center (PIMC). Per IRB at Phoenix Indian Medical Center, "the proposed project does not concern an issue in a field consistent with the mission and priorities of the PIMC and cannot be organizationally/departmentally supported" (P. Bloomquist, personal communication, October 2, 2019).

Office of Sex Trafficking Intervention Research (STIR). The Office of Sex Trafficking Intervention Research (STIR) Office has collected ACE data from two different surveys over two years. The surveys also consist of a few drug related questions (D. Roe-Sepowitz, personal communication, August 30, 2019). The STIR Office was not able to provide analysis of data at the present time.

Regional Behavioral Health Authority (RBHA). Communication occurred with AHCCCS in order to contact all Arizona Regional or Tribal Behavioral Health Authority (T/RBHA) Children's System of Care administrators. Contact was made with Gabrielle Richard at AHCCCS and she made the request to their communications team for permission to contact the T/RBHAs (email communication, G. Richard, November 4, 2019, November 8, 2019 & December 6, 2019). To this date, there has been no specific information provided regarding types of data collected.

For the 16 agencies contacted, it was identified that very few collect both substance use and trauma (ACE) data; only four of the 16 agencies (ACJC, ADHS, ADJC, and STIR) collected data on complex trauma and substance use. Of the 16 agencies contacted, five collect data strictly on substance use, one strictly on trauma, two do not collect any data on substance use or trauma, and four are unknown. For the purposes of this report, data sharing agreements were developed only with agencies who collected both substance use and complex trauma data. Table 1 outlines the type of data each of the agencies collect.

Table 1: Data Variables Collected and Comments

Agency Contacted	Response Received	Complex Trauma	Substance Use	Agreed to DSA	Comments
Arizona Criminal Justice Commission	Yes	Yes	Yes	Yes	ACJC collects data on substance use and ACE via the AYS every other year.
Arizona Department of Child Safety	Yes	No	No	Not Necessary	ADCS collects does not collect data on substance use or complex trauma.
Arizona Department of Health Services	Yes	Yes	Yes	Yes	ADHS collects data on substance use and ACE from the YRBSS and BRFSS.
Arizona Department of Juvenile Corrections	Yes	Yes	Yes	Yes	ADJC collects data on substance use and ACE via the administration of the ACE Questionnaire, TSCC, and SASSI.
Arizona Department of Correction Rehabilitation and Reentry	Yes	No	Yes	Not Necessary	ADOCRR collects data on substance use but not on complex trauma.
Arizona Health Care Cost Containment System	Yes	No	Yes	Not Necessary	AHCCCS collects data on substance use but not on complex trauma.
Arizona Department of Veterans Affair	Yes	Unknown	Unknown	No	Contact was made with the ADVA; data regarding veterans were not shared.
Administrative Office of the Courts, Adult Probation Services	Yes	No	Yes	Not Necessary	AOC, APSD collects data on substance use but not on complex trauma.
Administrative Office of the Courts, Dependent Children Services	Yes	No	No	Not Necessary	AOC, DCS does not collect data on substance use or complex trauma.
Administrative Office of the Courts, Juvenile Justice Services	Yes	No	Yes	Not Necessary	AOC, JJSD collects data on substance use but not on complex trauma.
Bureau of Justice Statistics	Yes	No	Yes	Not Necessary	BJS collects data on substance use but not on complex trauma.
First Things First	Yes	Unknown	Unknown	Not Necessary	Contact was made with FTF. It is unknown if substance use and complex trauma data are collected.
Health Resources Services Administration, Maternal Child Health Bureau	Yes Online Data	Yes	No	Not Necessary	HRSA, MCHB collects data on complex trauma but not on substance use.
Indian Health Services, Phoenix Indian Medical Center	Yes	Unknown	Unknown	No	Contact was made with PIMC, however, there was no interest in sharing data on substance use or complex trauma.
Office of Sex Trafficking Intervention Research	Yes	Yes	Yes	Not Necessary	STIR collects data on substance use and ACE from two different surveys.
Regional Behavioral Health Authority	Yes	Unknown	Unknown	Not Necessary	Contact was made with the RBHA, however, specific information regarding types of data collected are not known.

2016 BRFSS Findings

      BRFSS Demographics. The overall BRFSS sample characteristics and results by each of the three ACE score subgroups (i.e., 0, 1-3, and 4+) are shown in Table 2. The final sample was comprised of 5,328 respondents, with more females than males (58.60% and 41.40%, respectively). Among these respondents, the majority identified as White (74.70%), followed by Hispanic or Latino (12.29%), Other (7.34%), Black (2.14%), and Multiracial (1.24%). In this sample, almost 40% had a college degree, about 30% had completed some college or tech school, and about 24% had a high school degree. Among the full sample, 702 (13.72%) have used an e-cigarette, 842 (18.03%) have used illicit drugs, and 363 (7.74%) responded having used prescription drugs without doctors' orders in their lifetime.

      About 14% (*n*=727) of participants reported an ACE score of zero. Reflecting the distribution on the full sample, there were slightly more females (53.78%) than males (46.22%), with the majority identified as being White (62.45%). About one-third of respondents had a college degree (34.80%). In regard to ever having used substances in their lifetime, 11.45% have used an e-cigarette, 23.39% have used illicit drugs, and 10.32% reported using prescription drugs without doctors' orders. Alcohol was the most used 30-day drug among this group (34.27%) followed by regular tobacco use (8.82%).

      The subgroup with an ACE score between 1-3 (81% of sample) was made up of more females (59.47%) than males (40.53%); 77.09% of this subsample was White, followed by 11.66% Hispanic or Latino. College degree category had the highest percentage of respondents at 41.29%, while 29.73% had some college or tech school, and 22.65% a high school diploma. Lifetime reports of having ever used an e-cigarette, illicit drugs, or prescriptions not as intended were either similar or lower than the zero ACE score group (12.76%, 16.60%, and 6.95% respectively). Slightly over half drank alcohol within the last 30 days (50.34%), 11.20% smoked, 8.14% reported binge drinking in the last 30 days, and less than 3% reported current use of e-cigarette, smokeless cigarettes, or illicit drugs.

      In the last subgroup were those with 4 or more ACE (5%), and 57.70% were female and 42.30% were male. Again, the majority identified as White (70.16%) followed by 13.11% Hispanic or Latino. High school diploma, some college or tech school, and college diploma were more closely grouped with 32.13%, 31.48%, and 30.16% respectively. Having ever used illicit drugs and e-cigarettes were within 5% of each other (36.24% and 31.25%). Finally, just over 50% drank alcohol, 24.92% smoked, 15.08% reported binge drinking, and 9.18% used illicit drugs in the last 30 days.

Table 2. BRFSS Demographic Characteristics by ACE Score

	Total Sample	ACE 0	ACE 1-3	ACE 4+
	n; %	n; %	n; %	n; %
Sample size	5,328; 100.00	727; 14.00	4,296; 81.00	305; 5.00
INDEPENDENT VARIABLES				
Gender				
Female	3,122; 58.60	391; 53.78	2,555; 59.47	176; 57.70
Male	2,206; 41.40	336; 46.22	1,741; 40.53	129; 42.30
Race				
White	3,980; 74.70	454; 62.45	3,312; 77.09	214; 70.16
Black or African American	114; 2.14	17; 2.34	85; 1.98	12; 3.93
Other	391; 7.34	104; 14.31	265; 6.17	22; 7.21
Multiracial	66; 1.24	15; 2.06	45; 1.05	6; 1.97
Hispanic or Latino	655; 12.29	114; 15.68	501; 11.66	40; 13.11
Don't know/Not sure /Refused	122; 2.29	23; 3.16	88; 2.05	11; 3.61
Education Level				
Primary or less	130; 2.44	29; 3.99	97; 2.26	4; 1.31
Some high school	230; 4.32	40; 5.50	175; 4.07	15; 4.92
High school graduation	1,258; 23.61	193; 26.55	973; 22.65	92; 30.16
Some college or tech school	1,585; 29.75	212; 29.16	1,277; 29.73	96; 31.48
College graduation	2,125; 39.88	253; 34.80	1,774; 41.29	98; 32.13
DEPENDENT VARIABLES				
Lifetime use (1/0)				
E-cig.	702; 13.72	60; 11.45	547; 12.76	95; 31.25
Illicit drugs	842; 18.03	29; 23.39	705; 16.60	108; 36.24
Prescriptions	363; 7.74	13; 10.32	296; 6.95	54; 17.82
Current use (30-day use; 1/0)				
Smoking	621; 11.66	64; 8.82	481; 11.20	76; 24.92
E-cig.	160; 3.00	13; 1.79	121; 2.82	26; 8.52
Smokeless tobacco	110; 2.14	13; 2.43	85; 1.98	12; 3.93
Illicit drugs	134; 2.52	5; 0.69	101; 2.35	28; 9.18
Alcohol	2545; 48.21	244; 34.27	2,146; 50.34	155; 50.99
Binge drinking	439; 8.29	45; 6.28	348; 8.14	46; 15.08

Ordinary Least Squares Regression Results of Continuous Substances Use Outcomes on ACE

Multiple linear regression analyses were conducted to predict participants' consumption of alcohol (i.e., numbers of days with at least 1 drink, binge drinking days, and average number of drinks) in the last 30 days on the ACE groups, while controlling for the demographic variables. Multiple linear regression is a predictive analysis used to explain the relationship between the dependent variable (continuous) and two or more independent variables (continuous or categorical) (Field, 2009). Table 3 shows that, compared to participants with no ACE, those who have an ACE score between 1-3 had .51 days less of consuming at least 1 drink in the last 30 days, had .49 more days of binge drinking, and .08 less average number of drinks. However, none of these were statistically significant at .05 level. Additionally, other things being equal, compared to participants with no ACE, those who have 4 or more ACE had 1.37 more days consuming at least one drink, 3.15 days more of binge drinking, and .18 more average number of drinks per occasion. However, results only showed a significant difference with binge drinking between the no ACE group and the 4 or more ACE group ($p < .05$).

Table 3. BRFSS OLS Regression Results for Alcohol Consumptions in the Past 30 Days

VARIABLES	(1) Average number of days	(2) Binge drinking days	(3) Average number of drinks per day
	Beta (95% CI)	Beta (95% CI)	Beta (95% CI)
Age	0.05***	0.03	-0.02***
	[0.025 - 0.068]	[-0.010 - 0.077]	[-0.022 - -0.014]
Male	2.27***	1.44	0.64***
	[1.554 - 2.988]	[-0.012 - 2.900]	[0.514 - 0.770]
Education levels	-0.12	-1.44***	-0.18***
	[-0.520 - 0.280]	[-2.182 - -0.708]	[-0.255 - -0.111]
Race (ref.= White)			
Black	-1.17	0.84	0.20
	[-3.617 - 1.272]	[-3.217 - 4.897]	[-0.234 - 0.640]
Other	-2.34**	-0.38	0.25
	[-3.819 - -0.869]	[-2.883 - 2.123]	[-0.019 - 0.518]
Multiracial	-2.67	1.24	0.11
	[-6.158 - 0.816]	[-4.884 - 7.370]	[-0.509 - 0.727]
Hispanic/Latino	-4.21***	-2.63*	0.17
	[-5.486 - -2.924]	[-4.757 - -0.496]	[-0.060 - 0.405]
ACE (ref. = 0 ACE)			
1-3 ACE	-0.51	0.49	-0.08
	[-1.738 - 0.713]	[-1.852 - 2.841]	[-0.309 - 0.139]
4+ ACE	1.37	3.15*	0.18
	[-0.485 - 3.220]	[0.031 - 6.271]	[-0.156 - 0.513]
Constant	5.24***	7.96***	3.51***
	[2.762 - 7.717]	[3.344 - 12.573]	[3.066 - 3.963]
Observations	2,545	439	2,497
R-squared	0.046	0.066	0.098

*** $p<0.001$, ** $p<0.01$, * $p<0.05$

Logistic Regression Results of Dummy Coded Substances Use on ACE

For all the substance use outcome variables that were dummy coded (1/0), a series of logistic regression models were conducted to examine the relationship between each of the substance use outcomes and the ACE groups while controlling for the demographic variables (i.e., age, gender, education, race/ethnicity). Logistic regression is a form of predictive analysis and is used to describe the relationship between a dependent binary and the independent variables (Field, 2009).

For the three current substance use outcome variables, Table 4 column (1) shows that, other things being equal, compared to participants with no ACE, those who have an ACE score between 1-3 had significantly higher odds of using cigarettes (by 49%, $p < .01$) and e-cigarettes (by 80%, $p < .05$). However, no significant differences were found for the smokeless cigarettes use. Similar trends were found for the comparison between those who have no ACE and have an ACE score of 4 or more. Results showed that those with an ACE score of 4 or higher had significantly higher odds of using cigarettes (by 225%, $p < .001$) and e-cigarettes (by 329%, $p <.001$). However, no significant differences were found for the use of smokeless tobacco.

For the three 30-day substance use outcome variables, Table 4 column (2) shows that other things being equal, compared to participants with no ACE, those who have an ACE score between 1-3 had significantly higher odds of having days with one or more drinks, binge drinking, and using illicit drugs during the last 30 days, by 82% (p < .001), 56% (p < .01) and 293% (p < .01), respectively. Similarly, compared to participants with no ACE, those who have an ACE score of 4 or higher had significantly higher odds of having had days with one or more drinks, binge drinking, and used illicit drugs during the last 30 days by 94%, 142% and 1182%, respectively (p < .001).

For lifetime substance use outcome variables, Table 4 column (3) shows that other things being equal, compared to participants with no ACE, those who have an ACE score between 1-3 had non-significant differences of using e-cigarettes, illicit drugs, and prescription drugs during their lifetime, however, results showed that those with an ACE score of 4 or higher had significantly higher odds of using e-cigarettes (by 211%, p <.001) and illicit drugs (by 65%, p < .05). No significant differences were found for the prescription drug use.

Table 4 also reported the covariates odds ratios (OR) on each of the substance use outcomes. Results found that every one year of age increase significantly decreased the odds of using each of the nine substance use outcomes (by 1%-4%; p < .01). Compared to females, males reported higher odds of using all of these nine substances (by 23%-550%; all p values < .05 except for currently using e-cigarettes). Every one increased level of education significantly decreased the odds of currently using cigarettes (by 35%, p < .001), e-cigarettes (by 21%, p < .01), and lifetime using e-cigarettes (by 22%, p < .001), but significantly increased the odds of having days drinking 1 or more drinks during the last 30 days (by 47%, p < .001), and lifetime illicit drug use (by 12%, p < .01).

In terms of race and ethnicity, the results showed that there is no significant difference of substance use between White and Black participants, however, compared with Whites, Hispanic/Latino participants had significantly lower odds of using all nine substances (by 5%-77%; all p values < .05 except for currently using smokeless tobacco and binge drinking during the last 30 days). Table 4 outlines the logistic regression results.

Table 4. BRFSS Logistic Regression Results of Substances Use on ACE

VARIABLES	(1) Current Use			(2) 30-Day Use			(3) Lifetime/Ever Use		
	Cigarettes	E-cigarettes	Smokeless Tobacco	Days with 1 or more drinks	Binge Drinking	Illicit Drugs	E-cigarettes	Illicit Drugs	Prescription Drugs
	^OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]
Age	0.98***	0.97***	0.98**	0.99**	0.97***	0.97***	0.96***	0.98***	0.98***
	[0.977 - 0.987]	[0.957 - 0.973]	[0.974 - 0.994]	[0.991 - 0.998]	[0.962 - 0.973]	[0.956 - 0.974]	[0.959 - 0.968]	[0.972 - 0.981]	[0.975 - 0.987]
Male	1.25*	1.23	6.50***	1.51***	2.32***	2.66***	1.38***	1.75***	1.87***
	[1.050 - 1.484]	[0.890 - 1.690]	[3.987 - 10.610]	[1.345 - 1.690]	[1.893 - 2.847]	[1.849 - 3.839]	[1.166 - 1.631]	[1.496 - 2.037]	[1.500 - 2.322]
Education levels	0.65***	0.79**	0.86	1.47***	1.04	1.06	0.78***	1.12**	1.07
	[0.597 - 0.707]	[0.676 - 0.933]	[0.710 - 1.036]	[1.386 - 1.563]	[0.933 - 1.152]	[0.875 - 1.283]	[0.714 - 0.845]	[1.028 - 1.216]	[0.950 - 1.202]
Race (ref.= White) Black	1.10	0.90	1.18	1.01	1.21	0.85	1.01	0.80	0.44
	[0.652 - 1.848]	[0.354 - 2.295]	[0.358 - 3.891]	[0.686 - 1.490]	[0.666 - 2.207]	[0.298 - 2.428]	[0.604 - 1.704]	[0.478 - 1.348]	[0.176 - 1.108]
Other	0.74	0.51*	1.68	0.47***	0.67*	0.57	0.71*	0.52***	0.51**
	[0.547 - 1.002]	[0.284 - 0.916]	[0.992 - 2.853]	[0.382 - 0.578]	[0.468 - 0.953]	[0.310 - 1.061]	[0.533 - 0.947]	[0.382 - 0.702]	[0.324 - 0.789]
Multiracial	1.74	0.64	0.62	0.67	0.85	1.62	1.86*	1.85*	0.99
	[0.929 - 3.274]	[0.150 - 2.759]	[0.083 - 4.670]	[0.399 - 1.113]	[0.353 - 2.049]	[0.547 - 4.804]	[1.005 - 3.429]	[1.033 - 3.314]	[0.412 - 2.390]
Hispanic / Latino	0.57***	0.47**	0.82	0.75**	0.95	0.23***	0.57***	0.52***	0.64*
	[0.429 - 0.756]	[0.271 - 0.805]	[0.435 - 1.554]	[0.625 - 0.908]	[0.699 - 1.287]	[0.101 - 0.548]	[0.435 - 0.749]	[0.395 - 0.693]	[0.436 - 0.938]
ACE (ref. = 0 ACE) 1-3 ACE	1.49**	1.80*	0.98	1.82***	1.56**	3.93**	1.31	0.65	0.64
	[1.128 - 1.976]	[1.001 - 3.233]	[0.535 - 1.780]	[1.529 - 2.158]	[1.117 - 2.167]	[1.585 - 9.759]	[0.974 - 1.759]	[0.422 - 1.010]	[0.354 - 1.164]
4+ ACE	3.25***	4.29***	1.60	1.94***	2.42***	12.82***	3.11***	1.65*	1.67
	[2.235 - 4.735]	[2.149 - 8.558]	[0.709 - 3.624]	[1.463 - 2.569]	[1.545 - 3.792]	[4.848 - 33.898]	[2.125 - 4.541]	[1.007 - 2.709]	[0.867 - 3.228]
Constant	1.30	0.31*	0.03***	0.15***	0.22***	0.02***	2.39***	0.69	0.23***
	[0.780 - 2.179]	[0.120 - 0.799]	[0.009 - 0.095]	[0.105 - 0.219]	[0.118 - 0.402]	[0.007 - 0.088]	[1.425 - 4.022]	[0.368 - 1.293]	[0.096 - 0.538]
Observations	**5,326**	**5,326**	**5,132**	**5,279**	**5,296**	**5,328**	**5,115**	**4,670**	**4,691**

^Note: For OR (Odds Ratio), when the value is less than 1, it is decreased by (1-OR)*100% and when the value is larger than 1, it is increased by (OR-1)*100%; for examples, an OR of .96 would indicate it decreased by (1-0.96)*100%=4%, and an OR of 1.47 would indicate an increase of (1.47-1)* 100%=47%.

2016 AYS Findings

AYS Demographics. The overall AYS sample characteristics and each of the three ACE score subgroups (i.e., 0, 1-3, and 4+) are shown in Table 5. The final sample was comprised of 42,009 respondents, with more females than males (51.51% and 48.62%, respectively). Among these respondents, the majority identified as White (44.79%), followed by Hispanic White (31.84%), Hispanic non-White (7.04%), Multiracial (non-Hispanic; 5.43%), and Black or African American (3.29%). In this sample, 38.06% of participants were in 8th grade, 33.40% were in 10th grade, and 28.54% were in 12th grade. Among the full sample, 11,741 (27.94%) have used an e-cigarette, 12,250 (29.16%) have used illicit drugs, and 5,164 (12.29%) responded having used prescription drugs without doctors' orders in their lifetime.

About 27% (*n*=11,407) of participants reported an ACE score of zero. Within the zero ACE subgroup, there were slightly more males (54.07%) than females (45.92%), with the majority identified as being White (46.86%). Eighth-graders made up the largest share (40.55%). In regard to ever having used substances in their lifetime, 16.15% have used an e-cigarette, 14.69% have used illicit drugs, and 4.53% reported using prescription drugs without doctors' orders. Alcohol was the most used 30-day drug among this group (25.73%) followed by illicit drugs (10.86%).

The subgroup with an ACE score between 1-3 (57% of sample) was made up of more females (52.24%) than males (47.76%); 45.34% of this subsample was White, followed by 31.97% Hispanic White. Eighth-graders had the highest percentage of respondents at 37.82%. Lifetime reports of having ever used an e-cigarette, illicit drugs, or prescriptions not as intended were higher than the zero ACE score group (29.91%, 31.17%, and 12.74% respectively). Thirty-day alcohol use was 45.70%, 21.86% smoked, and 20.10% reported illicit drug use in the last 30 days.

In the last subgroup were those with 4 or more ACE (16%), 58.10% being female and 40.64% male. Again, the majority identified as White (42.40%) followed by Hispanic White (31.02%). Eighth and 10th grade students made up equal shares (35%). Lifetime reports of e-cigarette, illicit drug, and prescription drug use were again higher than the previous group (44.34%, 53.39%, and 26.05%, respectively). Thirty-day use was also greater than in the previous group, with 63.37% reporting alcohol use, 41.46% reporting smoking, and 33.69% reporting illicit drug use.

Table 5. AYS Demographic Characteristics by ACE Score

	Total Sample	ACE 0	ACE 1-3	ACE 4+
	n; %	n; %	n; %	n; %
Sample size	42,009; 100.00	11,407; 27.00	24,003; 57.00	6,599; 16.00
INDEPENDENT VARIABLES				
Gender				
Female	21,296; 51.51	5,175; 45.92	12,342; 52.24	3,779; 58.10
Male	20,103; 48.62	6,094; 54.07	11,284; 47.76	2,725; 40.64
Race				
White (non-Hispanic)	18,815; 44.79	5,275; 46.86	10,770; 45.34	2,770; 42.40
Black or African American	1,380; 3.29	339; 3.01	836; 3.52	205; 3.14
Multiracial (non-Hispanic)	2,279; 5.43	489, 4.34	1339, 5.64	451, 6.90
Hispanic White	13,377; 31.84	3,757; 33.37	7,593; 31.97	2,027; 31.02
Hispanic non-White	2,958; 7.04	651; 5.78	1,656; 6.97	651; 9.96
Don't know/Not sure /Refused				
Education Level				
8th Grade	15,989; 38.06	4,625; 40.55	9,077; 37.82	2,287; 34.66
10th Grade	14,029; 33.40	3,644; 31.95	8,100; 33.75	2,285; 34.63
12th Grade	11,991; 28.54	3,138; 27.51	6,826; 28.44	2,027; 30.72
DEPENDENT VARIABLES				
Lifetime use (1/0)				
E-cig.	11,741; 27.94	1,810; 16.15	7,051; 29.91	2,880; 44.34
Illicit drugs	12,250; 29.16	1,611; 14.69	7,217; 31.17	3,422; 53.39
Prescriptions	5,164; 12.29	502; 4.53	2,979; 12.74	1,683; 26.05
Current use (30-day use; 1/0)				
Smoking	8,954; 21.31	1,106; 9.83	5,155; 21.86	2,693; 41.46
E-cig.	3,723; 8.86	405; 3.61	2,113; 8.97	1,205; 18.55
Smokeless tobacco	2,725; 6.49	367; 3.28	1,618; 6.88	740; 11.40
Illicit drugs	8,287; 19.73	1,239; 10.86	4,825; 20.10	2,223; 33.69
Alcohol	17,668; 42.06	2,863; 25.73	10,710; 45.70	4,095; 63.37
Binge drinking	5,264; 12.53	774; 6.91	3,091; 13.16	1,399; 21.62

Ordinary Least Squares Regression Results of Continuous Substances Use Outcomes on ACE

Multiple linear regression analyses were conducted to predict participants' consumption of alcohol (i.e., average number of drinks in past 30 days, binge drinking days in past two weeks) on the ACE groups, while controlling for the demographic variables. As noted above, multiple linear regression is a predictive analysis that accounts for the relationship between the dependent variable and two or more independent variables. Table 6 shows that, compared to participants with no ACE, those who have an ACE score between 1-3 had 0.174 days more of consuming at least one drink in the last 30 days, and had 0.095 more days of binge drinking. Both of these results were statistically significant at 0.001 level. Additionally, while controlling for demographic differences, compared to participants with no ACE, those who have 4 or more ACE had 0.526 more days consuming at least one drink, and 0.356 days more of binge drinking. These results were significant at 0.001 levels.

Table 6. AYS OLS Regression Results for Alcohol Consumptions in the Past 30 Days

VARIABLES	(1) Average number of days	(2) Binge drinking days
	Beta (95% CI)	Beta (95% CI)
Age	0.084***	0.054***
	[0.069-0.099]	[0.042-0.066]
Male	-0.025*	-0.046***
	[-0.047-0.003]	[-0.063--0.028]
Education levels	0.049***	0.022**
	[0.033-0.065]	[0.009-0.034]
Race (ref.= White)		
Black	-0.087**	0.040
	[-0.152--0.021]	[-0.091-0.012]
Other	--	--
	--	--
Multiracial	-0.011	-0.014
	[-0.038-0.061]	[-0.053-0.025]
Hispanic (White & non-White)	0.045***	0.047***
	[0.021-0.068]	[0.029-0.066]
ACE (ref. = 0 ACE)		
1-3 ACE	0.174***	0.095***
	[0.149-0.200]	[0.075-0.114]
4+ ACE	0.526***	0.356***
	[0.492-0.561]	[0.329-0.383]
Constant	-1.271***	-0.713***
	[-1.443--1.099]	[-0.889--0.617]
Observations	32,028	31,879
R-squared	0.073	0.047

*** $p<0.001$, ** $p<0.01$, * $p<0.05$

Logistic Regression Results of Dummy Coded Substances Use on ACE

As described above, a series of logistic regression models were conducted to examine the relationship between each of the substance use outcomes (dummy coded 0/1) and the ACE groups, while controlling for the demographic variables (i.e., age, gender, education, race/ethnicity). Logistic regression is a form of predictive analysis and is used to describe the relationship between a dependent binary and the independent variables (Field, 2009).

Table 7 shows results for the five 30-day substance use outcome variables, controlling for demographics variables. Compared to participants with no ACE, those who have an ACE score between 1-3 had significantly higher odds of using cigarettes (by 146%, $p < 0.001$) and e-cigarettes (by 104%, $p < 0.001$), having days with one or more drinks (by 87%, $p<0.001$), binge drinking (by 88%, $p<0.001$), and using illicit drugs (158%, $p<0.001$). Similar trends were found for the comparison between those who have no ACE and have an ACE score of 4 or higher. Results showed that those with an ACE score of 4 or higher had greater odds of using cigarettes (by 602%, $p < .001$), e-cigarettes (by 277%, $p <.001$), having days with one or more drinks (by 277%, $p<0.001$), binge drinking (by 290%, $p<0.001$), and using illicit drugs (by 567%, $p<0.001$).

Table 7 also shows results for the three lifetime substance use outcome variables, controlling for demographics variables. Compared to participants with no ACE, those who have an ACE score between 1-3 had significantly higher odds of using e-cigarettes (by 120%, p<0.001), illicit drugs (by 158%, p<0.001), and prescription drugs (by 193%, p<0.001) during their lifetime. Results showed that those with an ACE score of 4 or higher had greater odds of using e-cigarettes (by 353%, p <.001), illicit drugs (by 567%, p < .05), and prescription drugs (by 733%, p<0.001).

Table 7 also shows that for each one year increase in age, the odds increase for each of the nine substance use outcomes (by 17%-37%; p < 0.001). Compared to females, males reported significantly lower odds of 30-day e-cigarette use and illicit drug use and lifetime e-cigarette use and illicit drug use (by 14%-27%; all p values < 0.001). The relation of grade and odds of use are less consistent, with being in a higher grade significantly lowering the odds of substance use for having days with one or more drinks and 30-day and lifetime illicit drug use (30-45%, p<0.01), while being in a higher grade significantly increasing the odds of substance use for lifetime e-cigarette use (by 20-28%, p<0.05).

In terms of race and ethnicity, the results showed that there are significant differences in substance use between White and Black participants, with lower odds of using among Black participants (by 23-50%, p<.05, for 30-day smoking and e-cigarette use. However, compared with Whites, Hispanic participants had significantly greater odds of using all nine substances (by 9%-45%; p< 0.05).

Table 7. AYS Logistic Regression Results of Substances Use on ACE

VARIABLES	(1) 30-Day Use					(2) Lifetime Use		
	Cigarettes	E-cigarettes	Days with 1 or more drinks	Binge Drinking	Illicit Drugs	E-cigarettes	Illicit Drugs	Prescription Drugs
	^OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]
Age	1.366***	1.212***	1.412***	1.380***	1.240***	1.290***	1.240***	1.166***
	[1.308-1.427]	[1.157-1.270]	[1.334-1.494]	[1.311-1.452]	[1.181-1.302]	[1.243-1.338]	[1.181-1.302]	[1.107-1.227]
Male	0.97	0.727***	0.929	1.005	0.864***	0.864***	0.762***	0.864***
	[0.912-1.030]	[0.680-0.776]	[0.860-1.003]	[0.937-1.079]	[0.808-0.924]	[0.808-0.924]	[0.762-0723]	[0.808-0.924]
Education levels (8 vs 12)	1.093	1.057	0.701**	0.814	0.543***	1.207*	0.543***	0.845
	[0.913-1.309]	[0.870-1.285]	[0.553-0.887]	[0.659-1.006]	[0.442-0.666]	[1.036-1.405]	[0.442-0.666]	[0.682-1.048]
(10 vs 12)	1.090	1.120	1.040	1.021	0.877*	1.281***	0.877*	1.026
	[0.972-1.222]	[0.989-1.288]	[0.900-1.201]	[0.895-1.165]	[0.773-0.996]	[1.162-1.413]	[0.773-0.996]	[0.895-1.177]
Race (ref.= White) Black	0.771*	0.496***	0.718*	0.776*	0.985	0.683	0.985	0.849
	[0.629-0.945]	[0.960-1.102]	[0.550-0.938]	[0.610-0.986]	[0.799-1.216]	[0.575-0.811]	[0.799-1.216]	[0.674-1.071]
Other	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--
Multiracial	1.239**	0.880	0.932	0.918	1.171*	0.994	1.171*	1.218*
	[1.083-1.417]	[1.865-2.232]	[0.779-1.114]	[0.777-1.085]	[1.010-1.358]	[0.884-1.119]	[1.010-1.358]	[1.046-1.418]
Hispanic (White & non-White)	1.450***	1.028	1.094*	1.230***	1.219***	1.354***	1.219***	1.049
	[1.360-1.545]	[0.960-1.102]	[1.009-1.187]	[1.142-1.325]	[1.135-1.309]	[1.282-1.429]	[1.135-1.309]	[0.971-1.133]
ACE (ref. = 0 ACE) 1-3 ACE	2.464***	2.040***	1.866***	1.884***	2.580***	2.196***	2.580***	2.927***
	[2.261-2.685]	[1.865-2.232]	[1.678-2.075}	[1.710-2.075]	[2.332-2.854]	[2.054-2.347]	[2.332-2.854]	[2.601-3.294]
4+ ACE	7.016***	3.766***	3.772***	3.895***	6.671***	4.530***	6.671***	8.330***
	[6.366-7.732]	[3.398-4.174]	[3.349-4.249]	[3.493-4.344]	[5.973-7.450]	[4.178-4.910]	[5.973-7.450]	[7.352-9.439]
Constant	0.001***	0.006***	0.000***	0.000***	0.003***	0.004***	0.003***	0.003***
	--	--	--	--	--	--	--	--
Observations	31,253	31,932	32,028	31,879	32,143	31,950	32,143	32,069

2016 BRFSS and AYS Finding Comparisons

In order to compare we will utilize both the entire sample groups for BRFSS and AYS respondents compared to the groups reporting an ACE score of 4 or more. For both BRFSS and AYS, over half of the respondents in the samples were female, and this was also the case for the groups with an ACE score of 1-3 and 4 or more. The adult sample (BRFSS) had a larger percentage of White respondents (74.70%) than did the youth sample (AYS; 44.79%); this approximate 30% gap existed by race across all categories of ACE scores.

Already for the total sample group for lifetime use, Arizona youth have surpassed percentage of lifetime adult users for use of e-cigarettes (13.72% BRFSS, 27.94% AYS), illicit drugs (18.03% BRFSS, 29.16% AYS) and prescription drug use (7.74% BRFSS, 12.29 AYS). As to current 30-day use for the entire group, smoking (BRFSS 11.66%, AYS 21.31%), e-cigarettes (BRFSS 3.0%, AYS 8.86%), and smokeless tobacco (BRFSS 2.14%, AYS 6.49%) are 1.5 to 3 times higher for youth than for adults. For the entire sample regarding 30-day illicit drug use, the youth rate is 7.8 times higher than for adults (BRFSS 2.52% to AYS 19.73%). The percentage of adults and youth reporting 30-day illicit drug use if they had an ACE score of 4 or more was double those percentages reported for the total sample and youth were 3.6 times higher than adults (BRFSS 9.18%, AYS 33.69%). The specific comparisons are as follows:

- 30-day Smoking: BRFSS total 11.66%, AYS total 21.31%; BRFSS 4+ 24.92, AYS 4+ 41.46%;
- 30-day E-cigarettes: BRFSS total 3.0%, AYS total 8.86%; BRFSS 4+ 8.52%, AYS 4+ 18.55%;
- 30-day Smokeless tobacco: BRFSS total 2.14%, AYS 6.49%; BRFSS 4+ 3.93, AYS 4+ 11.40;
- 30-day Illicit drugs: BRFSS 2.52% to AYS 19.73% total; BRFSS 4+ 9.18%, AYS 4+ 33.69%.

Alcohol was the most used 30-day drug for both adults and youth. For the total sample for alcohol use in the past 30 days, adults reported a higher percentage for the sample overall than did youth (BRFSS 48.21%, AYS 42.06%). For those with an ACE score of 4 or more, half of adults (BRFSS 50.99%) and almost two-thirds of youth (AYS 63.37%) reported regular (within 30 days) use of alcohol. As to binge drinking in the past 30 days for those with an ACE score of 4 or more, 15.08% of adults reported this high-risk behavior as did 1 in 5 youth (21.62%). Table 8 shows the BRFSS and AYS findings comparisons.

Table 8. BRFSS and AYS Substance Use by ACE Score

	BRFSS		AYS	
	Total Sample	ACE 4+	Total Sample	ACE 4+
	n; %	n; %	n; %	n; %
Sample size	5,328; 100.00	305; 5.00	42,009; 100.00	6,599; 16.00
DEPENDENT VARIABLES				
Lifetime use (1/0)				
E-cig.	702; 13.72	95; 31.25	11,741; 27.94	2,880; 44.34
Illicit drugs	842; 18.03	108; 36.24	12,250; 29.16	3,422; 53.39
Prescriptions	363; 7.74	54; 17.82	5,164; 12.29	1,683; 26.05
Current use (30-day use; 1/0)				
Smoking	621; 11.66	76; 24.92	8,954; 21.31	2,693; 41.46
E-cig.	160; 3.00	26; 8.52	3,723; 8.86	1,205; 18.55
Smokeless tobacco	110; 2.14	12; 3.93	2,725; 6.49	740; 11.40
Illicit drugs	134; 2.52	28; 9.18	8,287; 19.73	2,223; 33.69
Alcohol	2545; 48.21	155; 50.99	17,668; 42.06	4,095; 63.37
Binge drinking	439; 8.29	46; 15.08	5,264; 12.53	1,399; 21.62

The results from the two regression analyses focused on the relationship between the sample groups with an ACE score of zero compared to the sample group that reported an ACE score of 4 or more. The multiple linear regression (OLS) analyses conducted were to predict participants' consumption of alcohol in the last 30 days based upon their ACE category. These findings confirmed the negative impact of having an ACE score of 4 or more as it was associated with alcohol consumption for both youth and adults. Compared to participants with no ACE, those BRFSS participants who had 4 or more ACE had 1.37 more days consuming at least one drink (not significant), and 3.15 days more of binge drinking (p<.05), whereas for AYS, those who have 4 or more ACE had 0.526 more days consuming at least one drink (p<.001), and 0.356 days more of binge drinking (p<.001).

The logistic regression, a form of predictive analysis, was conducted to examine the relationship between each of the substance use outcomes and the ACE categories while controlling for the demographic variables (i.e., age, gender, education, race/ethnicity). These adult and youth results for both 30-day and lifetime use showed that while having an ACE score between 1-3 does have a negative relationship with use rates, having an ACE score of 4 or more showed an even stronger negative impact. For three 30-day substance use outcome variables, comparing participants with no ACE to those who have an ACE score between 1-3, BRFSS participants had significantly higher odds of having days with one or more drinks, binge drinking, and using illicit drugs during the last 30 days (82%, 56%, and 293% respectively), and AYS participants had significantly higher odds of using cigarettes and e-cigarettes, having days with one or more drinks, binge drinking, and using illicit drugs (146%, 104%, 87%, 88%, and 158% respectively). This strong relationship was even more pronounced, for both BRFSS and AYS participants with no ACE compared to those who have an ACE score of 4 or higher, as they had significantly higher odds of having had days with one or more drinks, binge drinking, and using illicit drugs during the last 30 days (BRFSS 94%, 142%, and 1182%, respectively, and AYS 277%, 290%, and 567% respectively); and AYS participants with an ACE score of 4 or higher also had greater odds of using cigarettes and e-cigarettes (602% and 277%).

For the three lifetime substance use variables, BRFSS participants with no ACE compared to those with an ACE score of 4 or higher had significantly higher odds of using e-cigarettes (211%) and illicit drugs (65%). AYS results showed that those with an ACE score of 4 or higher had greater odds of using e-cigarettes, illicit drugs, and prescription drugs (120%, 158%, and 193% respectively).

The covariates odds ratios (OR) on each of the substance use outcomes showed few surprises. BRFSS results found that every one year of age increase significantly decreased the odds of each of the nine substance use outcomes (by 1%-4%) whereas the opposite was true for the adolescents from AYS, which showed that for each one year increase in age, the odds increase for each of the nine substance use outcomes (by 17%-37%). For the BRFSS adults, when compared to females, males reported higher odds of using all of these nine substances (by 23%-550%) except for currently using e-cigarettes. For AYS youth, compared to females, males reported significantly lower odds of 30-day e-cigarette use and illicit drug use and lifetime e-cigarette use and illicit drug use (by 14%-27%).

Adult (BRFSS) participants who were Hispanic/Latino had significantly lower odds of using all nine substances compared to White participants, except for currently using smokeless tobacco and binge drinking during the last 30 days; no significant difference existed between White and Black participants. For youth participants (AYS), results showed that there were significant differences in substance use between White and Black participants, with lower odds of using among Black participants, and that compared with Whites, Hispanic participants had significantly greater odds of using all nine substances.

Table 9 shows the comparative significant findings from the logistic regression (LR), odds ratios (OR), and multiple linear regression (MLR) findings of the BRFSS and AYS data for those with an ACE score of zero compared to a score of 4 or more. Table 10 shows the comparative significant findings from the LR of the BRFSS and AYS with an ACE score of zero compared to a score of 1-3.

Table 9. Comparison of Significant Findings: ACE 0 to ACE 4+

	BRFSS	AYS
	ACE 0 compared to ACE 4+	ACE 0 compared to ACE 4+
DEPENDENT VARIABLES		
Lifetime use	N/A	N/A
E-cig.	LR: Significantly higher odds (211%).	LR: Greater odds (120%).
Illicit drugs	LR: Significantly higher odds (65%).	LR: Greater odds (158%).
Prescriptions	N/A	LR: Greater odds (193%).
Current use (30-day use)	N/A	N/A
Smoking	N/A	LR: Significantly higher odds (602%).
E-cig.	N/A	LR: Significantly higher odds (277%).
Smokeless tobacco	N/A	N/A
Illicit drugs	LR: Significantly higher odds (1,182%).	LR: Significantly higher odds (567%)
Alcohol	LR: Significantly higher odds of having had days with one or more drinks (94%)	LR: Significantly higher odds of having had days with one or more drinks (277%). MLR: 0.526 more days consuming at least one drink-significant (p<.001).
Binge drinking	LR: Significantly higher odds (142%). MLR: 3.15 days more of binge drinking-significant (p<.001).	LR: Significantly higher odds (290%). MLR 0.356 days more of binge drinking-significant (p<.001).
All nine substances	OR: Every one year of age increase, the odds of each of the nine substance use outcomes significantly decreased by 1%-4%. OR: When compared to females, males reported higher odds of using all nine substances by 23%-550%, with the exception of currently using e-cig. OR: Hispanic/Latino had significantly lower odds of using all nine substances compared to Whites, except for currently using smokeless tobacco and binge drinking during the last 30 days	OR: Every one year of age increase, the odds of each of the nine substance use outcomes increased by 17%-37%. OR: When compared to females, males reported significantly lower odds of 30-day e-cigarette use and illicit drug use and lifetime e-cigarette use and illicit drug use by 14%-277%. OR: There were significant differences in substance use between White and Black participants, with lower odds of using among Black participants, and that compared with Whites, Hispanic participants had significantly greater odds of using all nine substances.

Table 10. Comparison of Significant Findings: ACE 0 to ACE 1-3

DEPENDENT VARIABLES	BRFSS ACE 0 compared to ACE 1-3	AYS ACE 0 compared to ACE 1-3
Current use (30-day use)	N/A	N/A
Smoking	N/A	LR: Significantly higher odds (146%).
E-cig.	N/A	LR: Significantly higher odds (104%).
Smokeless tobacco	N/A	N/A
Illicit drugs	LR: Significantly higher odds (293%).	LR: Significantly higher odds (158%).
Alcohol	LR: Significantly higher odds (82%) of having days with one or more drink.	LR: Significantly higher odds (87%) of having days with one or more drink.
Binge drinking	LR: Significantly higher odds (56%).	LR: Significantly higher odds (88%).

2018-2020 Arizona Department of Juvenile Corrections Findings

For purposes of this report, variables analyzed included: age, gender, ethnicity, grade level, ACE score, SUD level, and date the ACE or SUD were administered. Several ADJC variables differed from those analyzed for BRFSS and AYS; this was due to the data limitation of variables received. For example, the ADJC ACE questionnaire included ten questions for which a composite total ACE count score (treated as continuous variable) was created for each juvenile; only the composite score was provided by ADJC for this analysis. Additionally, the outcome variable for the ADJC is an overall estimation of the level of substance use disorder (SUD) rather than the specific substance used, which BRFSS and AYS used. The SUD was classified into three levels: mild, moderate, and severe. Given that SUD is a categorical variable, a multinomial logistic regression was conducted (Kwak & Clayton-Mathews, 2002). A multinomial logistic regression is an extension of the logistic regression and is used to predict a nominal (labeled or categorized) dependent variable given one or more independent variables (Hanneman, Kposowa, & Riddle, 2012).

Demographics. The sample provided from ADJC was comprised of 258 juveniles; the final sample consisted of 239 juveniles. Table 11 shows that the majority of juveniles were male (92.47%). Almost half of juveniles identified as Hispanic or Latino (48.54%), followed by White (17.15%), Black or African American (16.74%), Multiracial (10.46%), and Other (e.g., Asian, or from other country; 7.11%). The various grade levels for juveniles were from 8th to 12th grade, with 2.09% being 8th graders, 11.72% 9th graders, 28.87% 10th graders, 31.38% 11th graders, and 25.94% being 12th graders. The average ACE score for juveniles was 2.36 (*SD* = 2.03), ranging from 0 to 9. Sixty-five juveniles (27.20%) were diagnosed as mild on the SUD, 108 (45.19%) were diagnosed as moderate, and 66 (27.62%) were diagnosed as severe level.

Table 11. ADJC Demographic Characteristics (*N*=239)

Dependent Variables	
Substance Use Disorder (SUD)	***n; %***
Mild level of SUD	65; 27.20
Moderate level of SUD	108; 45.19
Severe level of SUD	66; 27.62
Independent Variable	**Mean; range**
ACE total counts	2.36; [0-9]
Control Variables	***n; %***
Gender	
Female	18; 7.53
Male	221; 92.47
Race	
White	41; 17.15
Black or African American	40; 16.74
Other	17; 7.11
Multiracial	25; 10.46
Hispanic or Latino	116; 48.54
Education Level	
8th grade	5; 2.09
9th grade	28; 11.72
10th grade	69; 28.87
11th grade	75; 31.38
12th grade	62; 25.94

Regression results. In order to investigate the role of juvenile justice ACE scores and the demographic variables in predicting the level of SUD, a multinomial logistic regression model was conducted using the three SUD levels as the dependent variable. The SUD severe level group was the reference group used to calculate the Relative Risk Ratio (RRR) for each group. The RRR represents the likelihood of belonging to a particular group in lieu of the reference group. Table 10 shows that ACE score appeared to be a significant predictor of group membership. Participants with higher total ACE scores had a lower probability association with the mild and moderate (lower level of SUD) category, therefore, participants with a higher total ACE score had a higher probability to be in the severe reference group.

Specifically, participants with higher ACE total count scores were associated with a higher risk probability of being in the severe level group (the highest level of SUD) (both RRRs = -0.19, *p* < .05). Table 12 shows that age, gender, education level, and race provided a few demographic predictors for membership for both mild and moderate SUD group levels. Specifically, compared to White youth, multi-racial youth were less likely to be in the mild SUD group level (RRR = -1.73, *p* < .05). Black youth, to the contrary, were more likely to fall in the moderate SUD group level (RRR = 1.87, *p* < .05).

Table 12. ADJC Multinomial Logistic Regression Results (*N* = 239)

Variable	Mild SUD RRRs [95% CI]	Moderate SUD RRRs [95% CI]
Age	-0.36	-0.27
	[-0.988 - 0.272]	[-0.824 - 0.287]
Gender	-0.53	-0.42
	[-1.950 - 0.899]	[-1.741 - 0.893]
Education levels	0.02	0.21
	[-0.582 - 0.630]	[-0.327 - 0.740]
Race (reference = White)		
Black	1.66	1.87*
	[-0.033 - 3.358]	[0.207 - 3.523]
Other	-1.50	-1.01
	[-3.070 - 0.074]	[-2.382 - 0.353]
Multiracial	-1.73*	-0.33
	[-3.293 - -0.160]	[-1.518 - 0.851]
Hispanic/Latino	-0.83	-0.22
	[-1.835 - 0.183]	[-1.160 - 0.716]
ACE total counts	-0.19*	-0.19*
	[-0.381 - -0.008]	[-0.349 - -0.028]
Constant	7.16*	3.69
	[0.497 - 13.816]	[-2.315 - 9.689]

Notes. Severe SUD as reference group; RRRs: Relative risk ratios; SUD: Substance use disorder; * *p* < 0.05

Discussion

The Substance Abuse Epi Work Group was tasked with answering two specific research questions. **The first research question** centered on determining what data existed in Arizona to identify the extent of substance use and trauma. Answering this question is important as a baseline for planning future surveillance efforts and implementing prevention and intervention services. This question was answered by contacting 16 agencies/entities for information on their data regarding substance use and trauma. It was determined that four entities collected both of these types of data, and three provided data for analysis in this report: Arizona Criminal Justice Commission (Arizona Youth Survey - AYS), Arizona Department of Health Services (Behavioral Risk Factor Surveillance System - BRFSS), and the Arizona Department of Juvenile Corrections (Adverse Childhood Experiences Questionnaire and the Substance Use Disorder Classification instrument from 2019 – 2020). The fourth source for both types of data, the Office of Sex Trafficking Intervention (STIR), was not able to provide data for this report.

Two of the data sources identified (BRFSS and AYS) respond to the need for population level data at the state level, with some breakouts at the county or zip code level, as well as general demographic data that includes breakouts by age, gender and ethnicity. These data are important to examine generalizable trends over time. Interestingly, the other two data sources (ADJC and STIR) highlight the importance of collecting both substance use and ACE data for smaller and/or targeted groups, data that could be helpful to all state agencies in providing services to their audiences. Agencies, funders, providers and coalitions want to be able to target their programs and activities to specific audiences and groups to have an impact at a community level or for a specific population in need. In order to know who needs what services, it would be beneficial for each agency to have more data on the prevalence of both substance use and adverse childhood experiences. Thus, while state and county level data are very important, it is also critical for each agency to have data specific to its group(s) that can be used for meeting needs and sharing insights across agencies.

The second research question asked about the relationships that existed between substance use and trauma as identified from the data. Insights from examining data relationships could provide keys to programming and policies that would help decrease substance use behaviors. The researchers were also interested in comparing the similarities and differences of the findings across the adult (BRFSS) and youth (AYS) statewide populations. Further, although the ADJC data both had substance use and ACE indicator data, these were from a smaller specific subpopulation with different data variables.

Importantly, the second research question was answered in the affirmative that it was possible to examine the relationships between substance use and ACE data within each of these three individual datasets. For BRFSS and AYS, this was accomplished by determining similar variables between the BRFSS and AYS datasets and conducting the same statistical analyses for both datasets, as described in the Methodology and Findings. A series of statistical analyses were conducted to provide findings on the degree of relationships between substance use and trauma, with the goal of leading to a better understanding of the role that ACEs play in the behaviors of individuals with fewer or more experiences of adversity in their lives. In the case of ADJC, the examination of relationships of substance use and ACE data was conducted, but the substance use questions were asked and tallied differently from the BRFSS and AYS questions, so a slightly different type of analysis was used for this subgroup.

In examining the data relationships, the researchers and Epi members asked what findings might arise from conducting a comparative analysis of BRFSS to AYS data to show similarities and differences between the adult and youth results. In conducting those comparisons it was interesting to note, for

example, that over half of the respondents in both samples were female, and this was also the case for the groups with an ACE score of 1-3 and 4 or more (in contrast, the ADJC sample was over 90% male.) The BRFSS adult sample had a larger percentage of White respondents than did the youth sample, and there were differences by race across all categories of ACE scores; this seemingly reflects the changing demographics in Arizona youth toward a majority minority population and holds implications for future services.

For the AYS total sample for comparing lifetime use, Arizona youth have already surpassed the percentage of lifetime adult users for use of e-cigarettes, illicit drugs and prescription drug use. As to current 30-day use for the entire group, smoking, e-cigarettes and smokeless tobacco are 1.5 to 3 times higher for youth than for adults. Arizona's future adult reports will most likely reflect these higher percentages of lifetime use.

Youth rates are also higher across the total sample when comparing current use, with 30-day illicit drug use 7.8 times higher for youth than for adults. For adults and youth who had an ACE score of 4 or higher, 30-day illicit drug use was double those percentages reported for the total sample, and youth rates were 3.6 times higher than adults.

Although sometimes de-prioritized, alcohol continues to be the 30-day drug of choice for both adults and youth. For the total sample, adults reported a higher percentage overall than did youth showing that almost half of the adults and 4 in 10 youth had consumed alcohol in the past 30 days. For those with an ACE score of 4 or more, half of adults and almost two-thirds of youth reported regular use of alcohol. As to binge drinking in the past 30 days for those with an ACE score of 4 or more, 1 in 5 youth and just slightly fewer adults reported this high-risk behavior. Although it has long been easy for youth to obtain alcohol, it is illegal for those under 21 years of age in Arizona. Given these high percentages of use, we cannot ignore alcohol as both a gateway and long-term drug that needs attention in prevention, intervention and treatment planning.

To examine the relationships across the substance use and ACE data for the BRFSS and AYS populations, the results from the two regression analyses focused on the sample groups with an ACE score of zero compared to the sample group that reported an ACE score of 4 or more. The multiple linear regression (OLS) findings confirmed the negative impact of having an ACE score of 4 or more as it showed a positive association with more alcohol consumption for both youth and adults. Compared to participants with no ACE, both BRFSS and AYS participants who had an ACE score of 4 or more had more days consuming at least one drink and more days of binge drinking.

This strong relationship of an ACE score of 4 or more related to more substance use was evident when examining other substances. For the three lifetime substance use outcome variables, compared to participants with no ACE, those adults with an ACE score of 4 or more had significantly higher odds of using two of the substances and youth with an ACE score of 4 or more had significantly higher odds of using all three of the substances.

For the 30-day substance use indicators, adults with an ACE score of 4 or more had significantly higher odds of having had days with one or more drinks, binge drinking, or using illicit drugs; youth participants with an ACE score of 4 or more were at higher risk for those substance categories and also had greater odds of using cigarettes and e-cigarettes. Indeed, the 2016 AYS Report (Arizona Criminal Justice Commission et al., 2016) showed that 7.6% of 12th grade youth engaged in consuming alcohol and prescription drugs at the same time (poly-substance use) in the last 30 days. More substance use,

and possible poly-substance use, in conjunction with the strong positive relationship of having a higher ACE score, need to be of great concern given the known tendency to engage in these risky substance behaviors as coping mechanisms for trauma.

On each of the substance use outcomes, the covariates odds ratios (OR) showed some important, albeit expected aspects. For the BRFSS adults, when compared to females, males reported higher odds of using all of these nine substances except for currently using e-cigarettes. For AYS youth, compared to females, males reported significantly lower odds of 30-day use of four substances. This may impact the decision about target messages and target populations for prevention and intervention programs if females are catching up to or surpassing males in use rates.

As to race and ethnicity, Hispanic/Latino BRFSS adult participants had significantly lower odds of using all nine substances compared to White participants, except for currently using smokeless tobacco and binge drinking during the last 30 days; no significant difference existed between White and Black participants. For AYS youth participants, there were significant differences in substance use between White and Black participants, with lower odds of use among Black participants, and that compared with Whites, Hispanic participants had significantly greater odds of using all nine substances.

The substance use and ACE relationship was examined from several perspectives, each yielding similar results: the higher the ACE score the stronger the relationship with use of substances. Examining substance use and trauma together has sought to indicate the extent of the overlap of these problem indicators, and provide guidance as to which substances and audiences should be targeted for trauma-informed prevention, intervention and treatment services and programs in Arizona. The earlier discussions of the strong influence of risk and protective factors as mediators and the influence of ecodevelopmental indicators and determinants can help guide in the planning of these efforts.

Conclusions and Recommendations

The Epi Work Group, with assistance from ACJC and ASU-SIRC staff, completed this comprehensive substance use and trauma statewide profile to aid in data-driven decision-making. The results showed the datasets specific to Arizona held by 16 state agencies/entities. Further, the work examined some of these data to identify substance use and ACE trauma findings. After defining the research questions and methodology, data sharing agreements were arranged, and data analyses were conducted, with results described in this final report.

Specific to substance use and trauma, the findings provide a baseline year of information on the data and data gaps that exist, and describe methods to examine data and databases across agencies and topics. The reported data findings, conclusions and recommendations should be used in a data-driven decision-making process to address needs, resources, practices and policies that impact substance use outcomes around systems and individuals in Arizona. The collection, analysis and use of data is work that needs to be supported at the decision-making levels to achieve the longer-term positive outcomes of decreased substance use and less experiences of adversity for Arizona individuals and communities.

Data Gaps Identified

In seeking to identify data gaps, it became apparent that, of the 16 agencies/entities contacted for information on their data regarding substance use and trauma, only four agencies - ACJC, ADHS, ADJC, and STIR - collected data in both categories. This leaves gaps in knowledge about clients and others served by the 12 state agencies/entities not collecting both types of data. While substance use and ACE data existed together in two population level surveys, that is not enough to understand the target groups served by Arizona's many agencies and service providers. Each agency should collect both types of data to gain a better understanding of its target group and their needs for services around trauma or through a trauma-informed lens. ADJC, in collecting both types of data for its specific sub-population, has the information needed to provide specialized services and add to the overall knowledge base of the risk factors experienced by this group. Without the ACE data, agencies may be operating without the best information on how to provide needed services that could help their sub-population(s) to avoid ongoing risky behaviors. Data on trauma across agencies on the many sub-populations can also help to identify larger system issues and target populations for integrated services.

Recommendations to close these data gaps:
- Encourage all agencies, especially the 12 agencies and other providers not currently collecting both substance use and trauma (ACE) data, to begin collecting these data in the near future.
  - Provide information/education on the importance of collecting both types of data and how these data can be used to support each agency and meet the needs of sub-populations.
- Funding and data collection/analysis mechanisms should be made available to support collection of substance use and ACE data across all the agencies/entities.
  - Provide sample data collection instruments.
  - Provide training on data collection and analysis.
- Provide a state-level data support mechanism for the collection and analysis of substance use and ACE data.
  - Provide for data sharing agreements.
  - Provide for data dashboards.
- Continue to monitor which agencies/entities collect both substance use and ACE data.

Data Analysis Conducted to Examine Substance Use and Trauma Relationships

Several statewide datasets do exist that collect data on both substance use and trauma and can be analyzed to determine relationships. It was determined as feasible and methodologically possible to conduct comparisons using similar analysis on similar variables across datasets to produce meaningful results regarding relationships that existed between substance use and trauma. If these data continue to be collected, trends over time can be established. However, this is still not enough information to serve the needs of sub-populations, and thus additional agencies and data collection efforts should be encouraged to provide a robust picture of the extent of trauma within Arizona populations.

ADHS provided the 2016 Behavioral Risk Factor Surveillance System data and ACJC provided the 2016 Arizona Youth Survey data for analyses of the general adult and youth populations in Arizona. In 2016, respondents were asked questions on their substance use and trauma experiences on both of these instruments allowing for the comparison.

Researchers were able to develop and execute a data analysis plan that examined many of the same questions including demographic descriptive information, substance use (lifetime and current use) and six ACE items. In addition, ADJC provided substance use and trauma data for its sub-population of juveniles involved with their system. BRFSS, AYS, and ADJC results showed that the more frequent use of substances was directly related to the groups with an ACE score of 4 or more.

Recommendations to continue data collection and analysis of substance use and trauma data factors:
- Encourage the four agencies identified as having both types of data - ACJC, ADHS, ADJC, and STIR - to continue to collect both substance use and trauma data on a regular basis.
  - In addition to substance use questions, the ACE questions should be included on the AYS for each bi-annual administration.
  - In addition to substance use questions, the ACE questions should be included on the BRFSS survey annually or at least bi-annually.
  - In addition to substance use questions, the ACE questions should be included on the YRBSS survey annually or at least bi-annually.
  - The ACE questionnaire used at ADJC should be continued as a way to collect these data and the results should be added to the individuals' electronic case file. In addition, the substance use questions and the Substance Use Disorder Classification tool should continue to be used and results added to the individuals' electronic case file.
  - In addition to substance use questions, the ACE questions should continue to be included on STIR's annual Youth Experiences Survey (YES).
- Encourage the four agencies identified as having both types of data - ACJC, ADHS, ADJC, and STIR - to continue to provide data and results for state and local level decision-making. Data sharing agreements can be arranged for sharing of datasets for analysis. Agencies can opt to provide requested results with similar analysis performed.
- Encourage agencies use heat or geo mapping to identify areas throughout Arizona with high substance use rates and high ACE scores.
- Determine and support a state-level mechanism for ongoing cooperative data analysis that includes the resources supported by the Epi Work Group.
- Update the *Statewide Data Profile: Substance Use and Trauma* report on a bi-annual basis.

Data-Driven Decisions Made Based Upon Identified Substance Use and Trauma Results

The results from the identified relationships between substance use and trauma data should be used to inform prevention, intervention and treatment programs and policies in Arizona. One means for sustaining continued use of data is through integration with the state-level *ADHS Adverse Childhood Experience Action Plan.* In setting forth three goals, this public health plan seeks to take action toward reducing the number of ACEs for Arizona children, provide surveillance and analysis of data, and mitigate adverse health outcomes.

These BRFSS, AYS, and ADJC findings were clear and consistent across the data examined and showed that the need for programming will continue in the foreseeable future as these youth become our adults. Already for the entire BRFSS and AYS sample group for lifetime use, Arizona youth have surpassed the percentage of lifetime adult users for use of e-cigarettes, illicit drugs, and prescription drug use. Further, both 30-day and lifetime users having an ACE score of 4 or more had a positive association with more substance use. Adults and youth with an ACE score of 4 or more, had significantly higher odds of having had days with one or more drinks, binge drinking, or using illicit drugs during the last 30 days compared to those with an ACE score of 0 and youth participants also had greater odds of using cigarettes and e-cigarettes compared to those with an ACE score of 0. Alcohol continues to be the most used 30-day drug for both adults and youth overall, with four out of 10 adults and youth using in the past 30 days, and for those with an ACE score of 4 or more, half of adults and almost two-thirds of youth reported regular use of alcohol. In addition, the BRFSS and AYS data showed that Arizona youth identify more often as minority than the general adult population. When compared to White youth, Hispanic youth had greater odds of using all nine substances and Blacks had lower odds for 30-day smoking and e-cigarette use.

Recommendations on data-driven decision-making regarding substance use and trauma programs and policies in Arizona:
- Select programs that are targeted to specific population groups. Research has shown that targeted programming impacts program acceptance and successful outcomes.
    - Program selection should take into account the social, cultural, ethnicity/race, age, and gender factors and adaptations that need to be addressed so that culturally responsive community-based programming occurs for youth and adults.
    - Program selection should consider whether the target audience is a universal, selected, or indicated group so the program is a good fit.
    - Program selection should be tailored to the substance or poly-substances being addressed.
    - Program selection should be targeted for different groups according to the type and severity of trauma the participants have encountered.
- Select evidence-based programs to the extent that matches can be found between the target audiences and programs; all programs should, at a minimum, be able to demonstrate an evidence-informed framework and data results that show positive outcomes.
- Select trauma-specific services and/or infuse a trauma-informed component into all prevention, intervention and treatment programs and policies.
    - Addressing the co-morbidity of substance use and trauma should be a major consideration in program and policy implementation.
- Put in place statewide policies that support the implementation of targeted prevention, intervention, and treatment programs and practices.
- Integrate programs and policies with the ADHS Adverse Childhood Experience Action Plan.

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Appendix A
Updated AYS and BRFSS Cross Listing

AYS 2016	BRFSS 2016
6. Are you: MALE FEMALE	ASKGENDR Is the adult a man or a woman? 21 Male 22 Female S8q1 Indicate sex of respondent. Ask only if necessary. Are you ... (120) 1 Male 2 Female
7. How old are you?	S8q2 What is your age?
8. What grade are you in?	S8q7 What is the highest grade or year of school you completed?
9. Do you get a free or reduced cost lunch at school?	AZ4_3. In the past 12 months, did any children in your household between 5 and 18 years old receive free or reduced-cost lunches at school? AZ4_1. In the past 12 months, did you or anyone in your household get food stamps or a food stamp benefit card?
10. Are you Hispanic or Latino?	S8q3 Are you Hispanic, Latino/a, or Spanish origin?
11. What is your race?	S8q3b Are you... 1 Mexican, Mexican American, Chicano/a 2 Puerto Rican 3 Cuban 4 Another Hispanic, Latino/a, or Spanish origin S8q4 Which one or more of the following would you say is your race? S8q4a Is that... 41 Asian Indian 42 Chinese 43 Filipino 44 Japanese 45 Korean 46 Vietnamese

	47 Other Asian 77 Don't Know 99 Refused 51 Native Hawaiian 52 Guamanian or Chamorro 53 Samoan 54 Other Pacific Islander 77 Don't Know 99 Refused S8q4pi S8q5 Which one of these groups would you say best represents your race? S8q5a S8q5pi

12. Think of where you lived most of the time. Which of the following people live there with you? (Mark all that following apply.)
    a. mother
    b. stepmother
    c. father
    d. stepfather
    e. foster parent(s)
    f. grandparent(s)
    g. aunt
    h. uncle
    i. other adult(s)
    j. brother(s)
    k. stepbrother(s)
    l. sister(s)
    m. stepsister(s)
    n. other children
	S8q16 How many children less than 18 years of age live in your household?

13. Are your parents separated or divorced?	Az8_5. Were your parents separated or divorced? ^^An ACE question, on here twice^^
14. What is the highest level of education completed by your mother?	
15. What, if any, is the current military status of your parent(s)?	
16. Which of the following people do you feel comfortable going to for help when things go wrong or when you need someone to talk to about your problems?	

The next section asks about your experiences at school.	
17. In my school, *students* have lots of chances to help decide things like class activities and rules.	
18. I have lots of chances to be part of class discussions or activities.	
19. Teachers ask me to work on special classroom projects.	
20. My teachers notice when I am doing a good job.	
21. There are lots of chances for students in my school to get involved in sports, clubs, and other school activities outside of class.	
22. There are lots of chances for students in my school to talk with a teacher one-on-one.	
23. I feel safe at my school.	
24. The school lets my parents know when I have done something well.	
25. My teachers praise me when I work hard in school.	
26. I have lots of chances to be part of class discussions or activities.	
27. Now thinking back over the past year in school, how often did you:	
a. enjoy being in school?	
b. hate being in school?	
c. try to do your best work?	
d. feel that the school work you were assigned was meaningful and important?	
28. Putting them all together, what were your grades like last year?	
29. How important do you think the things you are learning in school are going to be for you later in life?	
30. How interesting are most of your courses to you?	
31. During the past 30 days, how many days of school have you missed because you skipped or 'cut'?	
32. During the past 12 months, how many times has someone threatened or injured you with a weapon such as a gun, knife, or club ON SCHOOL PROPERTY?	
33. During the past 12 months, how many times were you in a physical fight ON SCHOOL PROPERTY?	

34. During the past 12 months, how often have you been picked on or bullied by a student ON SCHOOL PROPERTY?	
35. During the past 12 months, how many times have you been harassed, mistreated, or made fun of by another person while on-line or through a cell phone or other electronic device?	
36. During the past 12 months, how often have you picked on or bullied another student ON SCHOOL PROPERTY?	
37. During the past 12 months, how often have you seen bullying ON SCHOOL PROPERTY and done nothing to stop it?	
38. During the past 30 days, on how many days did you NOT go to school because you felt you would be unsafe at school or on the way to or from school?	
39. During the past 30 days, on how many days did you carry a weapon such as a gun, knife, or club ON SCHOOL PROPERTY?	
40. What are the chances you would be seen as cool if you:	
a. smoked cigarettes?	
b. worked hard at school?	
c. began drinking alcoholic beverages regularly, that is, at least once or twice a month?	
d. defended someone who was being verbally abused at school?	
e. smoked marijuana?	
f. carried a handgun?	
g. regularly volunteered to do community service?	
h. were a member of a gang?	
41. How old were you when you first:	
a. smoked marijuana?	
b. smoked a cigarette, even just a puff?	
c. had more than a sip or two of beer, wine or hard liquor (for example, vodka, whiskey, or gin)?	
d. began drinking alcoholic beverages regularly, that is, at least once or twice a month?	
e. attacked someone with the idea of seriously hurting them?	
f. belonged to a gang?	

g. gambled or bet on anything (cards, lottery, sports, bingo, dice, raffles, casino, internet or video games, etc.)?	
h. used prescription drugs without a doctor telling you to take them?	
42. How wrong do you think it is for someone your age to:	
a. take a handgun to school?	
b. steal anything worth more than $5?	
c. pick a fight with someone?	
d. attack someone with the idea of seriously hurting them?	
e. stay away from school all day when their parents think they are at school?	
f. have one or two drinks of beer, wine, or hard liquor nearly every day?	
g. smoke cigarettes?	
h. smoke marijuana?	
i. use LSD, cocaine, amphetamines or another illegal drug?	
j. use prescription drugs without a doctor telling them to take them?	
43. How many times in the past year (12 months) have you:	
a. been suspended from school?	
b. carried a handgun?	
c. sold illegal drugs?	
d. stolen or tried to steal a motor vehicle such as a car or motorcycle?	
e. participated in clubs, organizations or activities at school?	
f. been arrested?	
g. attacked someone with the idea of seriously hurting them?	
h. been drunk or high at school?	
i. volunteered to do community service?	
j. taken a handgun to school?	
k. been hit, slapped, pushed, shoved, kicked or any other way physically assaulted by your boyfriend or girlfriend?	
l. seen someone punched with a fist, kicked, choked, or beaten up?	
m. seen someone attacked with a weapon, other than a gun, such as a knife, bat, bottle, or chain?	
n. seen someone shot or shot at?	

44. How often have you done the following for money, possessions, or anything of value:	
a. Played the lotter or scratch off tickets	
b. Bet on a game of personal skill such as pool or a video gram	
c. Played cards	
d. Played a dice game	
e. Bet on sports	
45. How many peers do you like to hang out with and spend time with?	
46. How many best friends (the friends you feel closest to) do you have?	
47. Think of your four best friends. In the past year (12 months), how many of your best friends have:	
a. participated in clubs, organizations or activities at school?	
b. smoked cigarettes?	
c. tried beer, wine or hard liquor (for example, vodka, whiskey, or gin) when their parents didn't know about it?	
d. made a commitment to stay drug-free?	
e. used marijuana?	
f. tried to do well in school?	
g. used LSD, cocaine, amphetamines, or other illegal drugs?	
h. been suspended from school?	
i. liked school?	
j. carried a handgun?	
k. sold illegal drugs?	
l. Stolen or tried to steal a motor vehicle such as a car or motorcycle?	
m. been arrested?	
n. dropped out of school?	
o. been members of a gang?	
p. been in a physical fight?	
48. I ignore rules that get in my way.	
49. I do the opposite of what people tell me, just to get them mad.	
50. I like to see how much I can get away with.	
51. I think sometimes it's okay to cheat at school.	
52. It is all right to beat up people if they start the fight.	
53. I think it is okay to take something without asking if you can get away with it.	

54. During the past 30 days, how many times did you RIDE in a car or other vehicle driven by someone who had been drinking alcohol?	
55. During the past 30 days, how many times did you DRIVE a car or other vehicle when you had been drinking alcohol?	**s15q1 During the past 30 days, how many times have you driven when you've had perhaps too much to drink?**
56. During the past 30 days, how many times did you DRIVE a car or other vehicle when you had been taking: prescription drugs (e.g., OxyContin, Vicodin, Valium, Xanax, Ritalin, Adderal, sleeping pills) that were not prescribed to you by a doctor or that you took only for the experience or feeling they cause?	
57. During the past 30 days, how many times did you DRIVE a car or other vehicle when you had been using marijuana?	
58. Think back over the LAST TWO WEEKS. How many times have you had five or more alcoholic drinks in a row?	**S11q2 One drink is equivalent to a 12-ounce beer, a 5-ounce glass of wine, or a drink with one shot of liquor. During the past 30 days, on the days when you drank, about how many drinks did you drink on the average?** AVEDRNK2 **S11q3 Considering all types of alcoholic beverages, how many times during the past 30 days did you have X [CATI X = 5 for men, X = 4 for women] or more drinks on an occasion?** DRNK3GE5
59. Have you ever smoked cigarettes? **Never** **Once or twice** **Once in a while but not regularly** **Regularly in the past** **Regularly now**	**S9q2 Do you now smoke cigarettes every day, some days, or not at all?** SMOKDAY2
60. During the past 30 days, on how many days did you smoke cigarettes?	**S9q2 Do you now smoke cigarettes every day, some days, or not at all?** SMOKDAY2
61. Have you ever used electronic cigarettes (e-cigarettes)?	**S10q1 Have you ever used an e-cigarette or other electronic —vaping‖ product, even just one time, in your entire life?**

62. During the past 30 days, on how many days did you use electronic cigarettes (e-cigarettes)?	**S10q2 Do you now use e-cigarettes or other electronic —vaping products** **every day** **some days** **or not at all?** **ECIGNOW**
63. How frequently have you used smokeless tobacco during the past 30 days?	**S9q5 Do you currently use chewing tobacco, snuff, or snus every day, some days, or not at all?** USENOW3

64. In the last 30 days, about how many times were you offered:
   a. Alcohol?
   b. Cigarettes?
   c. Marijuana?
   d. Rx drugs?
   e. Other drugs?	

65. During the past 12 months, how many times have you talked with your parents about strategies to avoid or resist people or places where you might be offered alcohol, prescription drugs, or other drugs?	
66. had alcoholic beverages (beer, wine or hard liquor) to drink in your lifetime – more than just a few sips?	**S11q4 During the past 30 days, what is the largest number of drinks you had on any occasion?**
67. had beer, wine or hard liquor to drink during the past 30 days?	**S11q1 During the past 30 days, how many days per week or per month did you have at least one drink of any alcoholic beverage such as beer, wine, a malt beverage or liquor?** ALCDAY5
68. used marijuana in your lifetime?	
69. used marijuana during the past 30 days?	
70. used LSD or other hallucinogens in your lifetime?	
71. used LSD or other hallucinogens during the past 30 days?	
72. used cocaine or crack in your lifetime?	

73. used cocaine or crack during the past 30 days? **79. used methamphetamines (meth, crystal meth) in the past 30 days?** **81. used heroin during the past 30 days?** **83. used Ecstasy ('X', 'E', MDMA, or 'Molly') in the past 30 days?**	**AZ11_2. When is the last time you used any illegal or illicit drugs, including marijuana, crack or cocaine, heroin or meth? READ LIST** **1 In the last 30 days** **2 In the last 12 months but not within the last 30 days** **3 Sometime in your lifetime but not within the last 12 months 7 Don't know** ^^Can code using first 30-day responses
74. sniffed glue, breathed the contents of an aerosol spray can, or inhaled other gases or sprays, in order to get high in your lifetime?	
75. sniffed glue, breathed the contents of an aerosol spray can, or inhaled other gases or sprays, in order to get high during the past 30 days?	
76. used phenoxydine (pox, px, breeze) in your lifetime?	
77. used phenoxydine (pox, px, breeze) during the past 30 days?	
78. used methamphetamines (meth, crystal meth) in your lifetime? **80. used heroin in your lifetime?** **82. used Ecstasy ('X', 'E', MDMA, or 'Molly') in your lifetime?**	**AZ11_1 Have you used any illegal or illicit drugs, including marijuana, crack cocaine, heroin or meth?**
84. used steroids or anabolic steroids (such as Anadrol, Oxandrin, Durabolin, Equipoise or Depotesterone) in your lifetime?	
85. used steroids or anabolic steroids (such as Anadrol, Oxandrin, Durabolin, Equipoise or Depotesterone) in the past 30 days?	
On how many occasions (if any) have you: **86. used prescription pain relievers (such as Vicodin, OxyContin, Percocet, or Codeine) without a doctor telling you to take them in your lifetime?**	**AZ10_1 Have you ever used any prescription drugs without a doctor telling you to take them?** AZ10_1

88. used prescription stimulants (such as Ritalin, Adderal, or Dexedrine) without a doctor telling you to take them in your lifetime? **90. used prescription sedatives (tranquilizers, such as Valium or Xanax, barbiturates, or sleeping pills) without a doctor telling you to take them in your lifetime?**	
87. used prescription pain relievers (such as Vicodin, OxyContin, Percocet, or Codeine) without a doctor telling you to take them during the past 30 days?	
89. used prescription stimulants (such as Ritalin, Adderal, or Dexedrine) without a doctor telling you to take them during the past 30 days?	
91. used prescription sedatives (tranquilizers, such as Valium or Xanax, barbiturates, or sleeping pills) without a doctor telling you to take them during the past 30 days?	
92. used over the counter drugs (such as cough syrup, cold medicine, or diet pills) for the purposes of getting high in your lifetime?	
93. used over the counter drugs (such as cough syrup, cold medicine, or diet pills) for the purposes of getting high during the past 30 days?	
94. used synthetic drugs (such as Bath Salts like Ivory Wave or White Lightning or herbal incense products like K2, Spice, or Gold) in your lifetime?	
95. used synthetic drugs (such as Bath Salts like Ivory Wave or White Lightning or herbal incense products like K2, Spice, or Gold) during the past 30 days?	
96. drank beer, wine or hard liquor at the same time you used prescription drugs (e.g., OxyContin, Vicodin, Valium, Xanax, Ritalin, Adderal, sleeping pills) during the past 30 days?	
97. If during the past 30 days you used marijuana, how did you get it? (Mark all that apply.)	
98. In the last 30 days, how often have you avoided people or places because you might be offered alcohol, cigarettes, marijuana or other drugs including prescription drugs?	
99. In the last 30 days, how often did you respond in the following ways when alcohol, cigarettes, marijuana or other drugs including	

prescription drugs were offered to you? (Fill in an answer for each way of responding)	
a. say "No" without giving a reason why.	
b. give an explanation or excuse to turn down the offer.	
c. decide to leave the situation without accepting the offer.	
d. use some other way to not accept the alcohol or drugs.	
100. How much do you think people risk harming themselves (physically or in other ways) if they:	
a. smoke one or more packs of cigarettes per day?	
b. try marijuana once or twice?	
c. smoke marijuana once or twice a week?	
d. take one or two drinks of an alcoholic beverage (beer, wine, liquor) nearly everyday?	
e. have five or more drinks of an alcoholic beverage in a row once or twice a week?	
f. use prescription drugs without a doctor telling them to take them?	
101. Compared to using illegal drugs (e.g., cocaine, meth, heroin), how harmful do you think it is for people to take prescription drugs (e.g., OxyContin, Vicodin, Valium, Xanax, Ritalin, Adderal, sleeping pills) without a doctor telling them to take them?	
102. If during the past 30 days you drank alcohol, how did you get it? (Mark all that apply.)	
103. If, during the past 30 days you used prescription drugs in order to get high, not for a medical reason, how did you get them? (Mark all that apply.)	
104. If you used alcohol, tobacco, or other drugs in the past 30 days, please tell us about some of your reasons for using (Mark all that apply):	
105. If you did not use alcohol, tobacco, or other drugs in the past 30 days, please tell us about some of the reasons for not using (Mark all that apply):	
106. About how many adults (over 21) have you known personally who in the past year have:	

a. used marijuana, crack, cocaine, or other drugs?	
b. sold or dealt drugs?	
c. done other things that could get them in trouble with the police, like stealing, selling stolen goods, mugging or assaulting others, etc.?	
d. gotten drunk or high?	
107. If you wanted to get some cigarettes, how easy would it be for you to get some?	
108. If you wanted to get some beer, wine or hard liquor (for example, vodka, whiskey, or gin), how easy would it be for you to get some?	
109. If you wanted to get some marijuana, how easy would it be for you to get some?	
110. If you wanted to get a drug like cocaine, LSD, or amphetamines, how easy would it be for you to get some?	
111. If you wanted to get a handgun, how easy would it be for you to get one?	
112. If a kid smoked marijuana in your neighborhood, he or she would be caught by the police.	
113. If a kid drank some beer, wine or hard liquor (for example, vodka, whiskey, or gin) in your neighborhood, he or she would be caught by the police.	
114. If a kid carried a handgun in your neighborhood, he or she would be caught by the police.	
115. Have you ever belonged to a gang?	
116. If you have ever belonged to a gang, what was the one major reason you joined?	
117. How wrong would most adults (over 21) in your neighborhood think it is for kids your age:	
a. to use marijuana?	
b. to drink alcohol?	
c. to smoke cigarettes?	
118. How wrong do your friends feel it would be for you to:	
a. have one or two drinks of an alcoholic beverage nearly every day?	
b. smoke tobacco?	
c. smoke marijuana?	
d. use prescription drugs not prescribed to you?	

119. During the past 12 months, do you recall hearing, reading, or watching an advertisement about the prevention of substance use?	
120. If I had to move, I would miss the neighborhood I now live in.	
121. My neighbors notice when I am doing a good job and let me know about it.	
122. I like my neighborhood.	
123. There are lots of adults in my neighborhood I could talk to about something important.	
124. I'd like to get out of my neighborhood.	
125. There are people in my neighborhood who are proud of me when I do something well.	
126. There are people in my neighborhood who encourage me to do my best.	
127. I feel safe in my neighborhood.	
128. During a typical week, how many days do all or most of your family eat at least one meal together?	
129. During the past 12 months, have you talked with at least one of your parents about the dangers of tobacco, alcohol, prescription drugs, or illegal drugs? By parents, we mean your biological parents, adoptive parents, stepparents, or adult guardians – whether or not they live with you. (Mark all that apply.)	
130. Have any of your brothers or sisters ever:	
a. drunk beer, wine or hard liquor (for example, vodka, whiskey or gin)?	
b. smoked marijuana?	
c. smoked cigarettes?	
d. taken a handgun to school?	
131. Has anyone in your family ever had severe alcohol or drug problems?	
132. Have any of your relatives been in prison or jail any time during the past year (12 months)? (Mark all that apply.)	
133. How wrong do your parents feel it would be for YOU to:	
a. have 1 to 2 drinks of beer, wine, or hard liquor (for example, vodka, whiskey or gin) nearly every day?	
b. smoke cigarettes?	
c. smoke marijuana?	
d. steal something worth more than $5?	

e. draw graffiti, write things, or draw pictures on buildings or other property (without the owner's permission)?	
f. pick a fight with someone?	
g. use prescription drugs without a doctor telling you to take them?	
134. The rules in my family are clear.	
135. People in my family often insult or yell at each other.	
136. When I am not at home, one of my parents knows where I am and who I am with.	
137. We argue about the same things in my family over and over.	
138. If I drank some beer, wine or liquor (for example, vodka, whiskey, or gin) without my parents' permission, my parents would catch me.	
139. My family has clear rules about alcohol and drug use.	
140. If I carried a handgun without my parents' permission, my parents would catch me.	
141. If I skipped school, my parents would catch me.	
142. My parents ask me what I think before most family decisions affecting me are made.	
143. I feel very close to my mother.	
144. I feel very close to my father.	
145. I share my thoughts and feelings with my mother.	
146. I share my thoughts and feelings with my father.	
147. I enjoy spending time with my mother.	
148. I enjoy spending time with my father.	
149. If I had a personal problem, I could ask my mom or dad for help.	
150. My parents give me lots of chances to do fun things with them.	
151. My parents ask if I've gotten my homework done.	
152. People in my family have serious arguments.	
153. My parents would know if I did not come home on time.	
154. It is important to be honest with your parents, even if they become upset or you get punished.	
155. My parents notice when I am doing a good job and let me know about it.	

156. How often do your parents tell you they're proud of you for something you've done?	
157. In a normal school week, how many days are you home after school for at least one hour without an adult there?	
158. In the last month, how often have you felt:	
a. that you were unable to control the important things in your life?	
b. confident about you abilities to handle your personal problems?	
c. that things were going your way?	
d. that difficulties were piling up so high that you could not overcome them?	
159. In the last 30 days, how many times have you taken money that didn't belong to you or used someone else's credit card without their approval in order to:	
a. Purchase alcohol?	
b. Purchase prescription (Rx) drugs?	
c. Purchase illicit drugs (e.g. marijuana, meth, heroin)?	
d. Purchase a gun, knife, or other weapon?	
e. Support gang activities?	
f. Gamble or place a bet?	
160. All questions refer to the time period from when you were born until now. Now, looking back —	
a. **Did you live with anyone who was a problem drinker or alcoholic?**	**Az8_2. Did you live with anyone who was a problem drinker or alcoholic?**
b. **Did you live with anyone who used illegal street drugs or who abused prescription medications?**	**Az8_3. Did you live with anyone who used illegal street drugs or who abused prescription medications?**
c. **Did you live with anyone who served time or was sentenced to serve time in a prison, jail, or other correctional facility?**	**Az8_4. Did you live with anyone who served time or was sentenced to serve time in a prison, jail, or other correctional facility?**
d. **Were you parents separated or divorced?**	**Az8_5. Were you parents separated or divorced?**
e. **How often did adults in your home ever slap, hit, kick, punch, or beat each other up?**	**Az8_6. How often did your parents or adults in your home ever slap, hit, kick, punch or beat each other up?**
f. **How often did an adult in your home ever swear at you, insult you, or put you down?**	**Az8_8. How often did a parent or adult in your home ever swear at you, insult you, or put you down?**

161. People have many different types of interactions with their peers at school. Please answer the following questions about your peer experiences in school during the last month.	
a. How often do other students exclude you from activities?	
b. How often are other students mean to you?	
c. How often do other students push or hit you?	
d. How often do other students make fun of you?	
162. Please indicate how much these statements describe you.	
a. I expect good things to happen to me.	
b. I am excited about my future.	
c. I trust my future will turn out well.	
d. I develop step-by-step plans to reach my goals.	
e. I have goals in my life.	
f. If I set goals, I take action to reach them.	
g. It is important to me that I reach my goals.	
h. I know how to make my plans happen.	
163. Please indicate how often this happens.	
a. How often do you make plans to achieve your goals?	
b. How often do you have trouble figuring out how to make your goals happen?	

Appendix B
Measures

Dependent Variables. Table 13 shows the survey questions assessed in the AYS and BRFSS. The variables look at how much and how often participants consume alcohol, tobacco, and illicit drugs.

Table 13: Dependent Variables

Variables	Survey Question
Average number of drinks per day	During the past 30 days, on the days when you drank, about how many drinks did you drink on the average?
Average number of drinks in the past 30 days	During the past 30 days, how many days per week or per month did you have at least one drink of any alcoholic beverage such as beer, wine, a malt beverage or liquor?
Binge drinking – past 30 days	Considering all types of alcoholic beverages, how many times during the past 30 days did you have X [X = 5 for men, X = 4 for women] or more drinks on an occasion?
Average number of drinks –past 30 days	During the past 30 days, how many days per week or per month did you have at least one drink of any alcoholic beverage such as beer, wine, a malt beverage or liquor? (continuous variable)
Cigarette Smoker	Do you now smoke cigarettes every day, some days, or not at all? (recoded into 2 groups: 1 = yes or 0 = no)
E-cig user	Do you now use e-cigarettes or other electronic products (1 = yes or 0 = no)
E-cigarette – lifetime use	Have you ever used an e-cigarette or other electronic (i.e., vaping) even just one time, in your entire life? (1 = yes or 0 = no)
Illicit drug -past 30 days	How many times in the last 30 days did you use any illegal or illicit drugs, including marijuana, crack or cocaine, heroin or meth? (continuous variable)
Illicit drug –lifetime use	Have you used any illegal or illicit drugs, including marijuana, crack cocaine, heroin or meth? (1 = yes or 0 = no)
Prescription drugs – lifetime use	Have you ever used any prescription drugs without a doctor telling you to take them? (1 = yes or 0 = no)

Independent Variables. The independent variable analyzed was the ACE score. The research team created three subgroups based on the total ACE score. The first group was for those who had a zero score. The second group was for those who scored between one and three. The third group was for those participants that scored a four or higher. For the total ACE score, participants were asked whether they had the following six different ACE conditions:
1)   living with anyone who have a problem drinker or alcoholic;
2)   living with anyone who used illegal street drugs or who abused prescription medications;
3)   living with anyone who served time or was sentences to serve time in a prison, jail, or other correctional facility;
4)   parents separated or divorced;
5)   having adults in home ever slap, hit, kick, punch, or beat each other up;
6)   having an adult in home ever swear at you, insult you, or put you down.

Covariates. For demographic characteristics at the individual level, the participants indicated choices which were coded for analysis"

- Gender: male or female (1=male; 0= female),
- Education (grade 8 = reference group; grade 10 & 12, 1=yes, 0=no).
- Age was a continuous variable
- Race was indicated by selecting White (1=yes, 0=no) , Hispanic (1=yes, 0=no), Black or African American (1=yes, 0=no), American Indian (1=yes, 0=no), Asian (1=yes, 0=no), Hawaiian (1=yes, 0=no), Mixed (1=yes, 0=no), and other race (1=missing or don't know).

Appendix C
Data Analysis Plan

   The following outline provides a description of how the methodology was determined and the
timeline of activities to support each phase of the analysis as well as the types of statistics that were
undertaken.

1.   Introduction to data analyzed:
     a.   Agency from which data were obtained
     b.   Discussion of the data collection instruments:
             i.   Number of variables
            ii.   Target population (compare demographic descriptions on datasets, e.g., race,
                  gender, education, etc.)
           iii.   Year of data being used
2.   Phase I – July2019 Report
     a.   Discussed the programs used to examine the variables (Stata, SPSS)
     b.   Discussed data clean-up process
     c.   Discussed which variables matched and the number
     d.   Discussed which point in time was used for the analysis (2016)
             i.   30-day Use (discussed given non-overlapped measures)
     e.   Discussed which variables were used for analysis
             i.   ACE Score & Substances

AYS	BRFSS
1. Alcohol 2. Tobacco 3. Marijuana 4. Cocaine 5. Meth 6. Rx	• Combines variables into "illegal or illicit drugs, including marijuana, crack cocaine, heroin or meth"

     f.   Discussed how data were coded to match the original CDC-Kaiser Permanente study
             i.   Dummy code ACE score (1/0)
                   a.   0 = ACE score = 0
                   b.   1 = ACE score ≥ 1
            ii.   ACE score as range variables:
                   a.   0 = ACE score = 0
                   b.   1 = score of 1-3 ACE
                   c.   2 = score of 4+ ACE
     g.   Discussed in detail which statistics were conducted for this report and provided
          information as to what that statistic accomplishes (importance & significance)
             i.   Descriptive Statistics (crosstabs)
                   1.   Frequencies (mean, percentages, standard deviation)
                         a.   Demographics:
                                 i.   Gender
                                ii.   Race

iii.   Education
    ii.   OLS (linear) regression to estimate ACE scores and 30-day substance use outcomes
        iii.   Logistic Regression
3. Phase II – October 2019 Report
    a. Did not include any statistical analysis
    b. Consisted of providing updates on the status of agencies
4. Phase III – December 2019 Report
    a. Discussed which point in time will be used for the analysis
        i.   Dependent Variables (DV): 30-day Use
    b. Discussed which variables will be used for analysis for this report
        i.   Independent Variables (IV): ACE score
    c. Discussed how data are coded
        i.   Created 3 subgroups based on ACE scores (0;1-3; 4+)
    d. Discussed which statistics were conducted
5. Phase IV – Final Report Summer 2020
    a. Discuss which point in time was used for the analysis
        i.   Lifetime Use
    b. Discuss which variables were used for analysis
    c. Discuss how data were coded
    d. Discuss which statistics were conducted and provide a brief statement as to what that statistic accomplishes (importance & significance)

Appendix D
Arizona Department of Health Services
List of Data Tables Available in the Fall of 2019

Table 14: ADHS List of Data Tables

	Counts	Estimated Costs	Charges	Medicaid	APC*	Trends – Counts	Trends – Charges	Trends – Medicaid	Trends – Rates	Events by Sex	Events by Race	Events by Age	Events by County	Events by Marital Status
Aggregated Induced Alcohol	X		X	X		X	X	X	X	X	X	X	X	X
Aggregated Induced Cannabis	X		X	X		X	X	X	X	X	X	X	X	X
Aggregated Induced Cocaine	X		X	X		X	X	X	X	X	X	X	X	X
Aggregated Induced Drugs	X		X	X		X	X	X	X	X	X	X	X	X
Aggregated Induced Heroin	X	X		X		X	X	X	X	X	X	X	X	X
Aggregated Induced Opioids	X		X	X	X	X	X	X	X	X	X	X	X	X
Aggregated Induced Prescription Opioids	X		X	X		X	X	X	X	X	X	X	X	X
Aggregated Related Alcohol	X		X	X	X	X	X	X	X	X	X	X	X	X
Aggregated Related Cannabis	X		X	X		X	X	X	X	X	X	X	X	X
Aggregated Related Cocaine	X		X	X		X	X	X	X	X	X	X	X	X
Aggregated Related Drug	X		X	X		X	X	X	X	X	X	X	X	X
Aggregated Related Heroin	X		X	X		X	X	X	X	X	X	X	X	X
Aggregated Related Opioids	X		X	X		X	X	X	X	X	X	X	X	X
Aggregated Related Poly-Drug	X		X	X		X	X	X	X	X	X	X	X	X
Aggregated Related Prescription Opioids	X		X	X		X	X	X	X	X	X	X	X	X

*Auricular Premature Contraction, as cause of death)

Appendix E
National Survey of Children's Health
(Excerpts from Child and Adolescent Health Measurement Initiative [CAHMI], 2018 and U.S. Census Bureau, 2018)

The National Survey of Children's Health (NSCH) is sponsored by the U.S. Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau, and is conducted by the U.S. Census Bureau (CAHMI, 2018). This report reflects the Family Health and Activities section of the survey for 2016, solely for Arizona which included nine questions, that were modified from the original ACEs survey questions, and were addressed to the parents and/or guardians of each family surveyed. This section does not include any substance use questions but does include questions specific to smoking. However, the Physical, Oral Health and Functional Status section of the NSCH survey does include one substance use question.

Background
The 2016 National Survey of Children's Health (NSCH) was conducted from June 2016 through February 2017 by the Census Bureau of the United States and CAHMI (2018). It was sponsored by the U.S. Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau (MCHB) and consolidated content from the NSCH and the National Survey of Children with Special Health Care Needs (CAHMI, 2018). This survey is designed to provide national and state-level estimates on key indicators of the health and well-being of children, their families and their communities, as well as information about the prevalence and impact of special health care needs (CAHMI, 2018).

Participants and Survey Collection
During data collection, a screener was first used to identify households. After completing this screener component of the survey, one child was randomly selected from all children in each household to be the subject of an age-specific topical survey. The respondent was a parent or guardian who knew about the child's health and health care needs (U.S. Census Bureau, 2018). For the 2016 survey, a total of 50,212 NSCH interviews were completed nationally by parents/caregivers of children and youth - approximately 985 in each state and the District of Columbia, ranging from 638 in Mississippi to 1,351 in Minnesota; the survey oversampled children with special health care needs and children 0-5 years of age (CAHMI, 2018).

Methodology and Results
A sample of 364,150 households was selected from the Census Master Address File and allocated across the 50 states and the District of Columbia. The sample was stratified by state and a child-presence indicator that allowed the Census Bureau (2018) to oversample households that were more likely to have children. The child-presence indicator was developed by the Census Bureau's Center for Administrative Records Research and Applications and builds on multiple sources of administrative data.

The weighted Overall Response Rate for the 2016 NSCH was 40.7%. A total of 138,009 screener questionnaires were completed from June 2016 to January 2017, and 67,047 of those were eligible for topical questionnaire follow-up. Of those topical-eligible households, 50,212 completed the topical questionnaire. The NSCH is designed to provide independent data results for each of the 50 states and the District of Columbia (U.S. Census Bureau, 2018).

Questions/Responses from National Survey of Children's Health
## Physical, Oral Health and Functional Status

Question: Does this child currently have substance abuse disorder, age 6-17 years? (U.S.)

Does this child currently have substance abuse disorder, age 6-17 years? ⓘ

	Does not have condition	Ever told, but does not currently have condition	Currently has condition	Total %
%	99.8	0.1	0.2	100.0
C.I.	99.7 - 99.8	0.0 - 0.1	0.1 - 0.2	
Sample Count	50,264	57	107	
Pop. Est.	48,857,645	35,942	79,960	

C.I. = 95% Confidence Interval.
Percentages and population estimates (Pop.Est.) are weighted to represent child population in US.

Prevalence of current substance abuse disorder
Children age 6-17 years
Nationwide
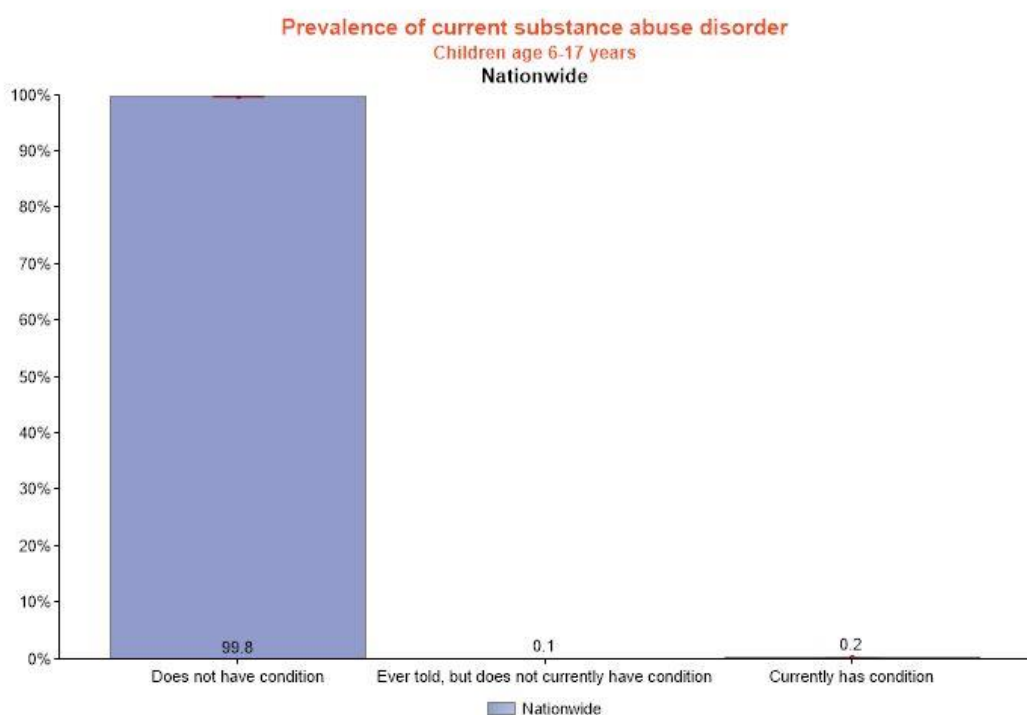
Family Health and Activities

Does anyone living in this child's household use cigarettes, cigars, or pipe tobacco?

Indicator 6.4: Does anyone living in this child's household use cigarettes, cigars, or pipe tobacco? ⓘ

	Someone in household uses tobacco	No one in household u tobacco	Total %
%	14.8	85.2	100.0
C.I.	11.6 - 18.8	81.2 - 88.4	
Sample Count	114	757	
Pop. Est.	232,402	1,333,919	

C.I. = 95% Confidence Interval.
Percentages and population estimates (Pop.Est.) are weighted to represent child population in US.

Children who live in households where someone smokes
Children age 0-17 years
Arizona
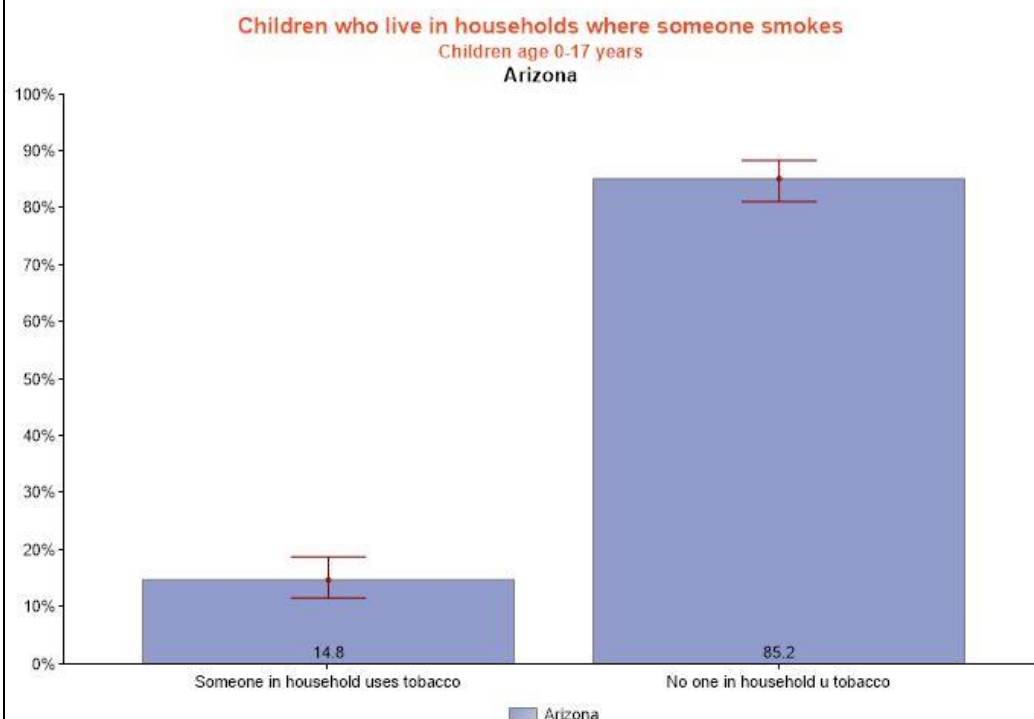
Does anyone smoke inside this child's home?

Indicator 6.4a: Does anyone smoke inside this child's home? ⓘ

	No one smokes in the household	Someone smokes, not inside the house	Someone smokes inside the house	Total %
%	85.2	13.3	1.6	100.0
C.I.	81.2 - 88.4	10.2 - 17.1	0.7 - 3.5	
Sample Count	757	104	10	
Pop. Est.	1,333,919	208,042	24,361	

C.I. = 95% Confidence Interval.
Percentages and population estimates (Pop.Est.) are weighted to represent child population in US.
☐ Please interpret with caution: estimate has a 95% confidence interval width exceeding 20 percentage points or 1.2 times the estimate and may not be reliable. For more information about the data suppression and display criteria click here.

Someone smokes inside of child's home
Children age 0-17 years
Arizona
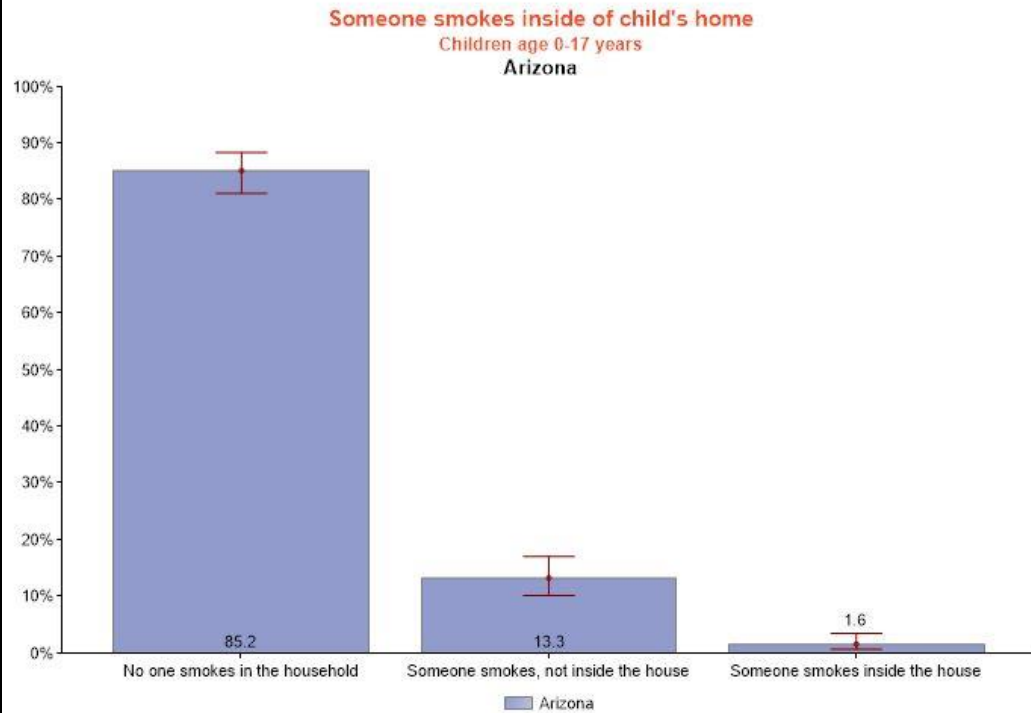
Family Health and Activities
Questions/Responses for Adverse Childhood Experiences

Indicator 6.13: Has this child experienced one or more adverse childhood experiences from the list of 9 ACEs? ⓘ

	No adverse childhood experiences	One adverse childhood experience	Two or more adverse childhood experiences	Total %
%	50.6	18.8	30.6	100.0
C.I.	45.8 - 55.5	15.4 - 22.7	26.0 - 35.6	
Sample Count	497	183	189	
Pop. Est.	787,824	292,036	475,801	

C.I. = 95% Confidence Interval.
Percentages and population estimates (Pop.Est.) are weighted to represent child population in US.

Adverse childhood experiences
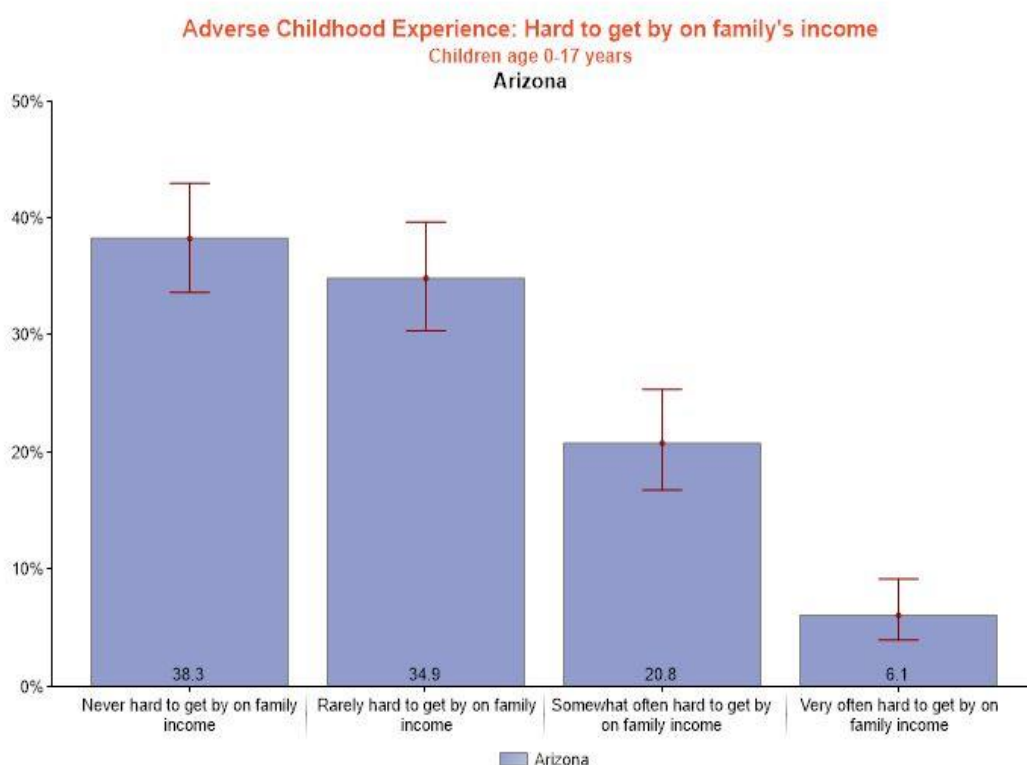Children age 0-17 years
Arizona
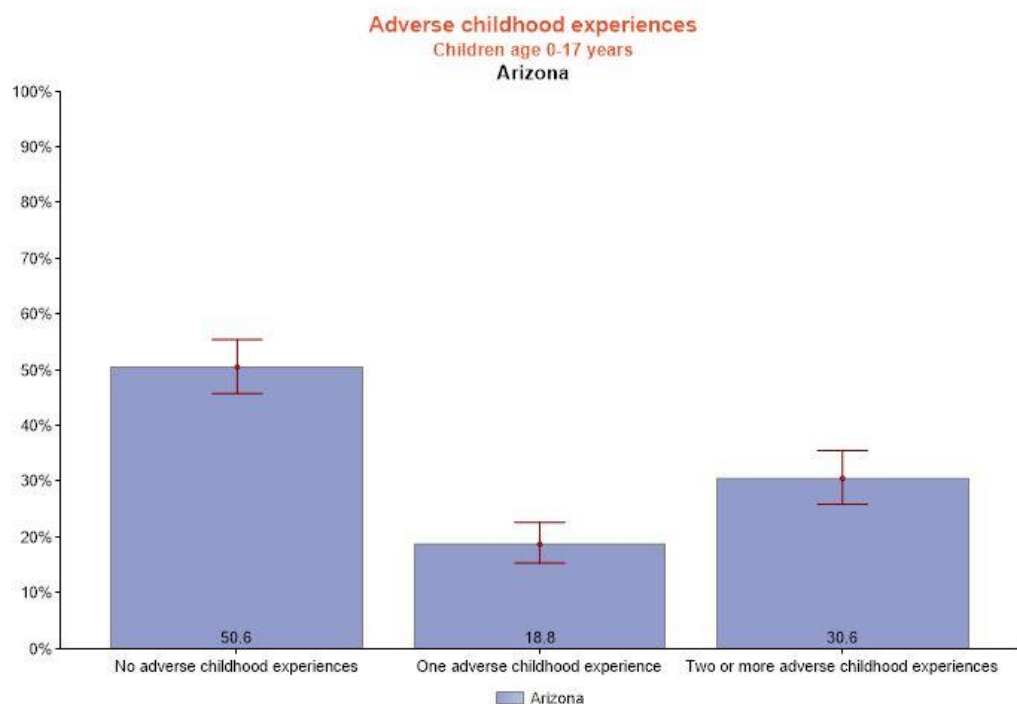
Question 1: Since this child was born, how often has it been very hard to get by on your family's income – hard to cover the basics like food or housing?

Since this child was born, how often has it been very hard to get by on your family's income – hard to cover the basics like food or housing? ⓘ

	Never hard to get by on family income	Rarely hard to get by on family income	Somewhat often hard to get by on family income	Very often hard to get by on family income	Total %
%	38.3	34.9	20.8	6.1	100.0
C.I.	33.7 - 43.0	30.4 - 39.7	16.8 - 25.4	4.0 - 9.2	
Sample Count	391	295	135	39	
Pop. Est.	587,765	536,138	319,054	93,487	

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Adverse Childhood Experience: Hard to get by on family's income
Children age 0-17 years
Arizona

Question 2: To the best of your knowledge, has this child ever experienced the following: parent or guardian who got divorced or separated?

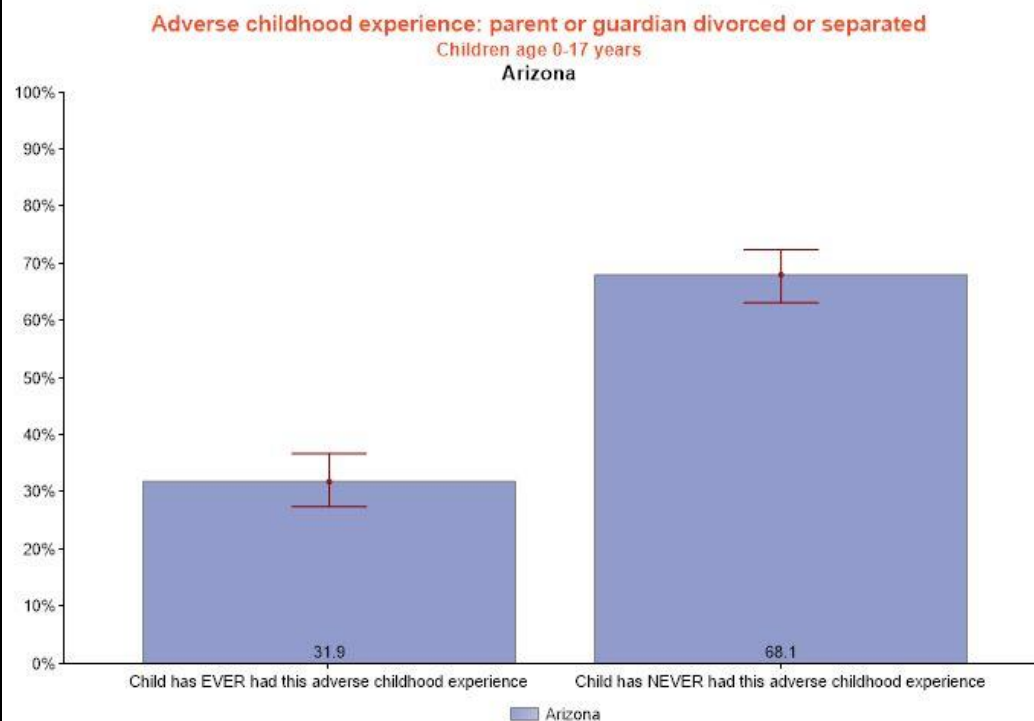To the best of your knowledge, has this child ever experienced the following: parent or guardian who got divorced or separated? ⓘ

	Child has EVER had this adverse childhood experience	Child has NEVER had this adverse childhood experience	Total %
%	31.9	68.1	100.0
C.I.	27.5 - 36.8	63.2 - 72.5	
Sample Count	234	628	
Pop. Est.	494,494	1,053,650	

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Percentages and population estimates (Pop.Est.) are weighted to represent child population in US.

DATA ALERT: The majority of measures have missing values less than 2% (unweighted). This measure has >=2% of missing cases. To learn about the impact of the missing values on the population count estimates click here.

Adverse childhood experience: parent or guardian divorced or separated
Children age 0-17 years
Arizona

Question 3: To the best of your knowledge, has this child ever experienced the following: parent or guardian died?

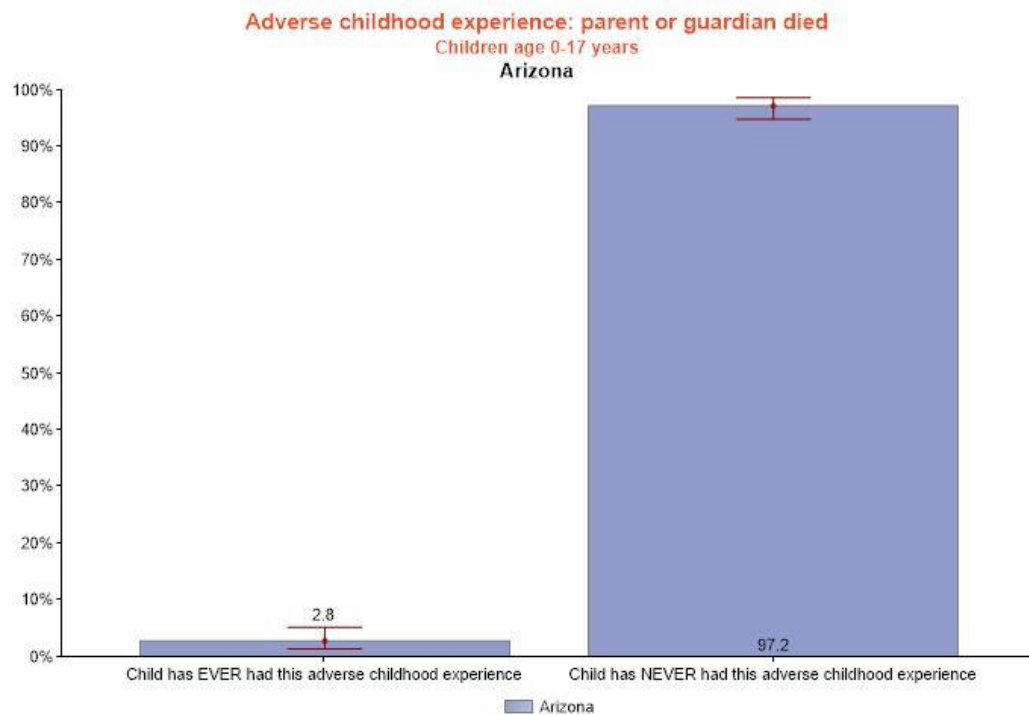To the best of your knowledge, has this child ever experienced the following: parent or guardian died? ⓘ

	Child has EVER had this adverse childhood experience	Child has NEVER had this adverse childhood experience	Total %
%	2.8	97.2	100.0
C.I.	1.4 - 5.2	94.8 - 98.6	
Sample Count	20	836	
Pop. Est.	42,288	1,493,963	

C.I. = 95% Confidence Interval.
Percentages and population estimates (Pop.Est.) are weighted to represent child population in US.
☐ Please interpret with caution: estimate has a 95% confidence interval width exceeding 20 percentage points or 1.2 times the estimate and may not be reliable. For more information about the data suppression and display criteria click here.

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Adverse childhood experience: parent or guardian died
Children age 0-17 years
Arizona

Question 4: To the best of your knowledge, has this child ever experienced the following: parent or guardian served time in jail?
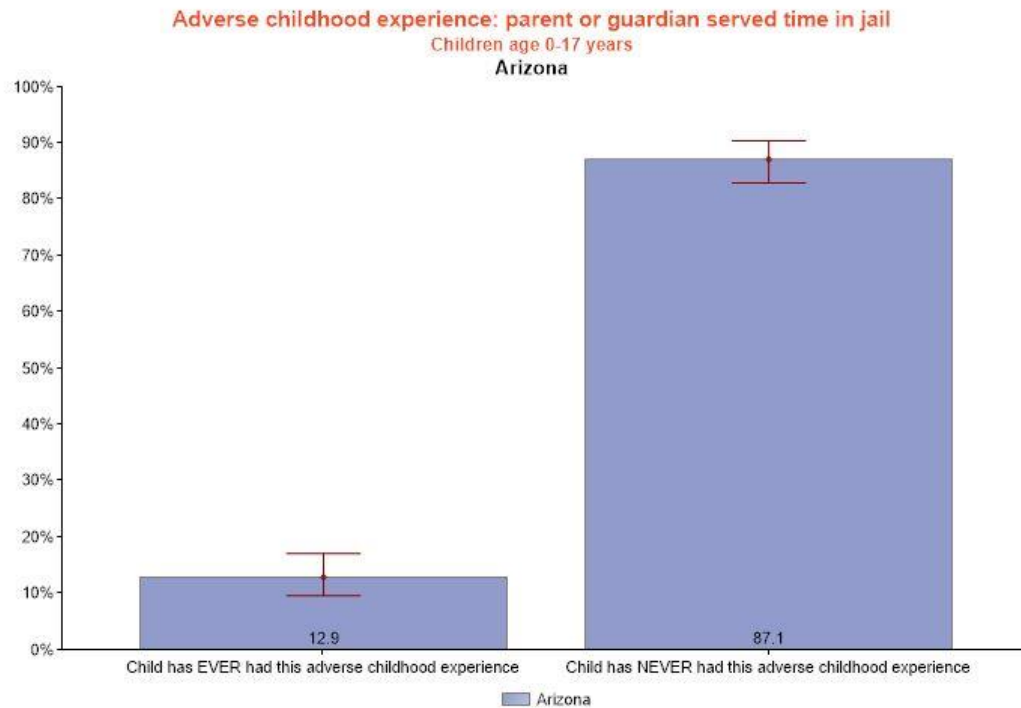
To the best of your knowledge, has this child ever experienced the following: parent or guardian served time in jail? ⓘ

	Child has EVER had this adverse childhood experience	Child has NEVER had this adverse childhood experience	Total %
%	12.9	87.1	100.0
C.I.	9.6 - 17.1	82.9 - 90.4	
Sample Count	70	789	
Pop. Est.	199,203	1,343,775	

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Adverse childhood experience: parent or guardian served time in jail
Children age 0-17 years
Arizona

Question 5: To the best of your knowledge, has this child ever experienced the following: saw or heard parents or adults slap, hit, kick, punch one another in the home?

To the best of your knowledge, has this child ever experienced the following: saw or heard parents or adults slap, hit, kick, punch one another in the home? ⓘ

	Child has EVER had this adverse childhood experience	Child has NEVER had this adverse childhood experience	Total %
%	10.8	89.2	100.0
C.I.	7.9 - 14.7	85.3 - 92.1	
Sample Count	60	797	
Pop. Est.	166,496	1,370,745	

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Adverse childhood experience: Witnessed domestic violence
Children age 0-17 years
Arizona
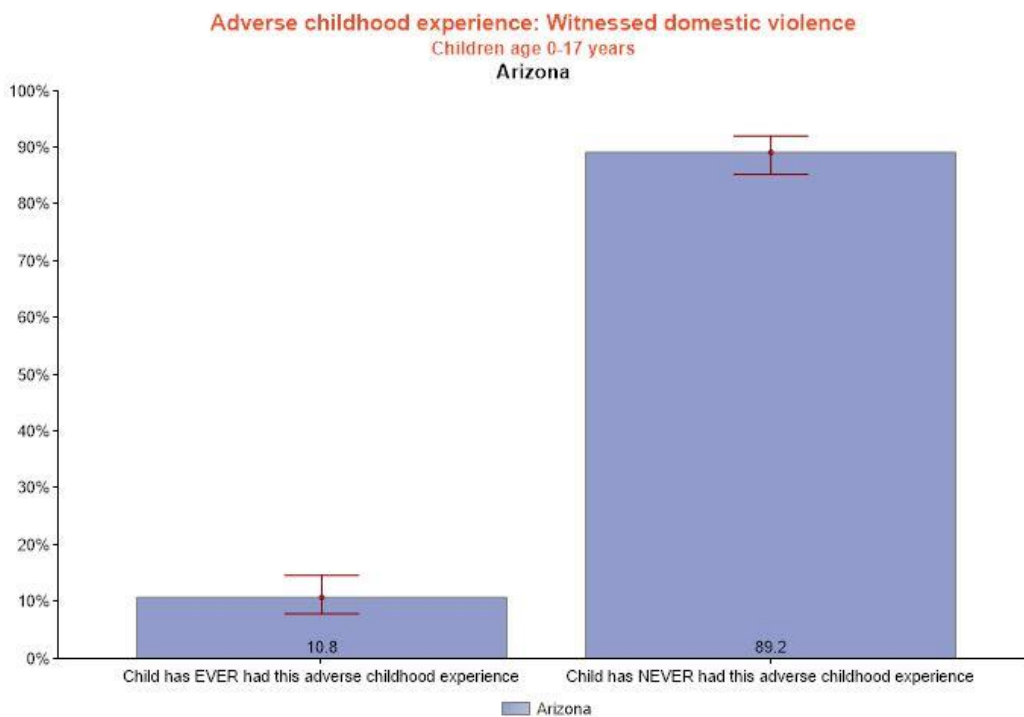
Question 6: To the best of your knowledge, has this child ever experienced the following: was a victim of violence or witnessed violence in his or her neighborhood?
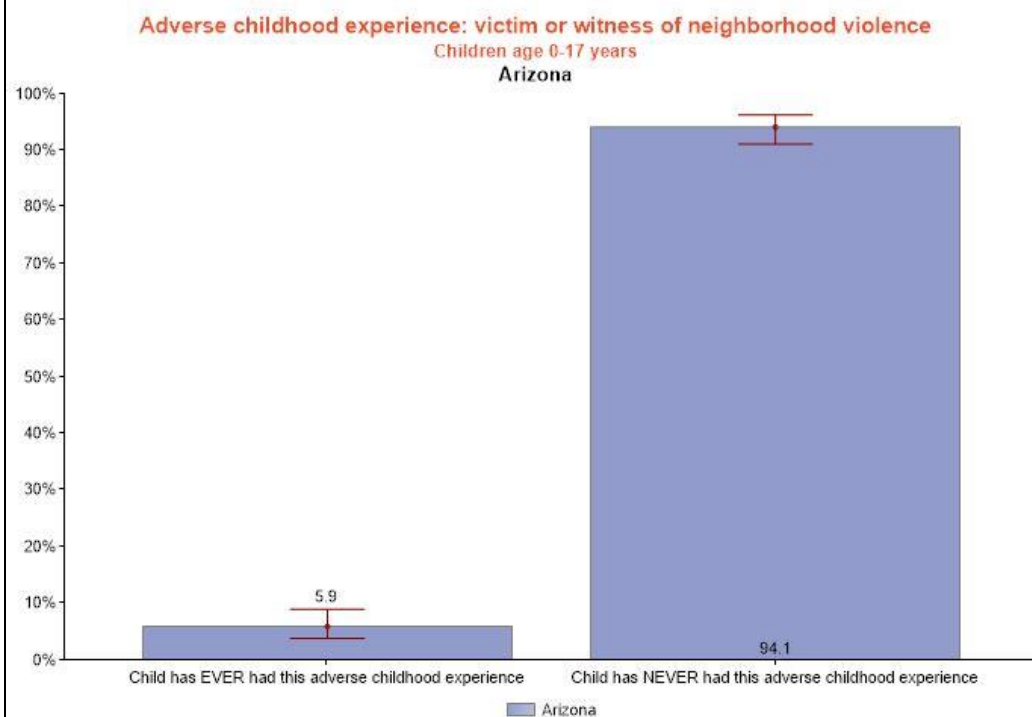
To the best of your knowledge, has this child ever experienced the following: was a victim of violence or witnessed violence in neighborhood? ⓘ

	Child has EVER had this adverse childhood experience	Child has NEVER had this adverse childhood experience	Total %
%	5.9	94.1	100.0
C.I.	3.8 - 8.9	91.1 - 96.2	
Sample Count	37	819	
Pop. Est.	89,933	1,439,613	

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Adverse childhood experience: victim or witness of neighborhood violence
Children age 0-17 years
Arizona

Question 7: To the best of your knowledge, has this child ever experienced the following: live with anyone who was mentally ill, suicidal, or severely depressed?

To the best of your knowledge, has this child ever experienced the following: live with anyone who was mentally ill, suicidal, or severely depressed? ⓘ

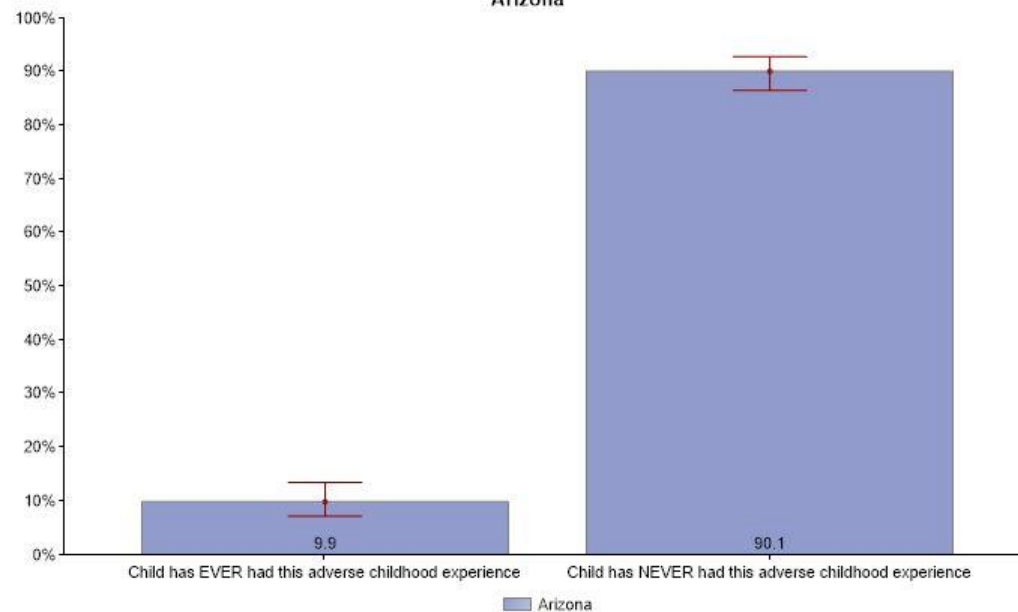|	Child has EVER had this adverse childhood experience	Child has NEVER had this adverse childhood experience	Total %
%	9.9	90.1	100.0
C.I.	7.2 - 13.5	86.5 - 92.8	
Sample Count	67	791	
Pop. Est.	152,266	1,385,126	

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Adverse childhood experience: lived with anyone who was mentally ill, suicidal, or severely depressed
Children age 0-17 years
Arizona

Question 8: To the best of your knowledge, has this child ever experienced the following: lived with anyone who had a problem with alcohol or drugs?

To the best of your knowledge, has this child ever experienced the following: lived with anyone who had a problem with alcohol or drugs? ⓘ

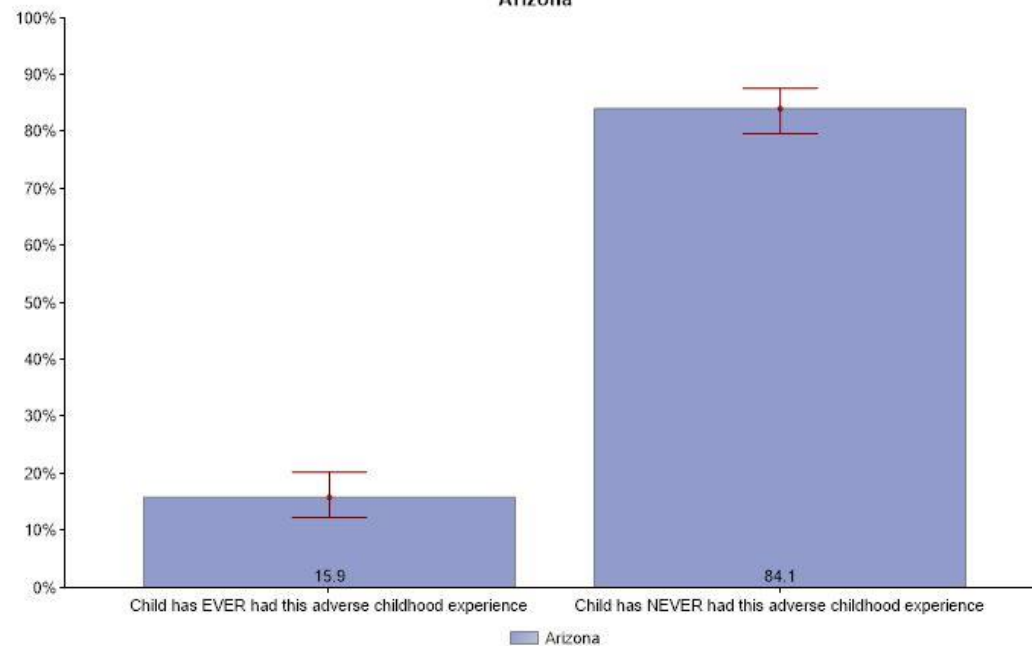|	Child has EVER had this adverse childhood experience	Child has NEVER had this adverse childhood experience	Total %
%	15.9	84.1	100.0
C.I.	12.3 - 20.3	79.7 - 87.7	
Sample Count	96	762	
Pop. Est.	243,924	1,288,736	

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Adverse childhood experience: lived with anyone who had a problem with alcohol or drugs
Children age 0-17 years
Arizona

Question 9: To the best of your knowledge, has this child ever experienced the following: treated or judged unfairly because of his or her race or ethnic group?

To the best of your knowledge, has this child ever experienced the following: treated or judged unfairly because of his or her race or ethnic group? ⓘ

	Child has EVER had this adverse childhood experience	Child has NEVER had this adverse childhood experience	Total %
%	3.9	96.1	100.0
C.I.	2.4 - 6.2	93.8 - 97.6	
Sample Count	30	829	
Pop. Est.	59,486	1,481,456	

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Adverse childhood experience: treated or judged unfairly because of his/her race or ethnic group
Children age 0-17 years
Arizona