School Health Needs Assessment

February 2023

Arizona Department of Health Services

School Health Team

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Section One: Introduction

The world will continue to feel the effects of the COVID-19 pandemic for years to come. While most of the impacts of the pandemic have been viewed as negative, deeper collaboration between the systems of healthcare, education, and social services were identified and prioritized. The COVID-19 pandemic necessitated increased collaboration between the Arizona Department of Education (ADE), the Arizona Department of Health Services (ADHS), Local Health Departments (LHDs), and Local Educational Agencies (LEAs). Collaboration at multiple levels and across sectors was critical in order to effectively address the pandemic. This moment presents a valuable opportunity to build on the deeper connections created through the pandemic response. This report was developed with the urgency and sense of deep collaboration brought forth by the pandemic and is intended to inspire action in addressing the health challenges that school-aged children in Arizona face, both longstanding and those exacerbated by the pandemic.

Over 1.1 million school-aged children were enrolled in Arizona's publicly funded schools when COVID-19 hit our nation and our state.[1] Children ages 5–19 spend about 6 to 7 hours per day, a large part of waking hours, in school during years critical to their social, psychological, physical, and intellectual development. The school year in Arizona is 180 days with varying start and end days by district or charter, also known as Local Education Agencies (LEAs). Schools are an ideal setting for health education and health promoting policies and practices; not only are there State and National Health Education Standards schools must follow, but Local School Wellness Policies are required for all schools participating in the National School Lunch Program. In spite of these beneficial policies and practices, the fullest potential for promoting health enhancing behaviors in school settings has not been fully realized. A coordinated, multi-agency effort to support schools in fully implementing restorative practices, cultural responsiveness, social and emotional learning, and family engagement could achieve this potential. [2]

Educational attainment and health are inextricably linked. Health is impacted by socio-economic factors such as poverty, geographical location, race, and ethnicity of which public schools in Arizona often exhibit broad diversity in. Similarly, student achievement is linked closely to the quality and funding level of schools, neighborhood conditions, socio-economic status of a student's family, and access to physical and behavioral healthcare. There are other factors that play a role in a student's academic performance and achievement. Research highlights youth risk behaviors that affect health as linked to poor academic performance and lower educational attainment such as substance use, inadequate sleep, physical inactivity, and poor dietary habits.[3] Two tools cited in this assessment, the Youth Risk Behavior Survey (YRBS) and the Arizona Youth Survey (AYS), provide significant insight into risk behaviors of Arizona adolescents. Root cause analysis of the findings from these surveillance tools needs to be conducted to identify how collaborative work can improve overall student health outcomes and associated education

[1] *AZ School Report Cards: State Reports*. AZ School Report Cards | State Reports. (n.d.). Retrieved June 21, 2022, from https://azreportcards.azed.gov/state-reports

[2] https://www.hepg.org/hep-home/books/creating-safe,-equitable,-engaging-schools

[3] Centers for Disease Control and Prevention. (2021, January 5). *Health and academics*. Centers for Disease Control and Prevention. Retrieved June 30, 2022, from https://www.cdc.gov/healthyschools/health_and_academics/index.htm

attainment. Data sharing across state-level organizations can significantly increase the opportunities for this research and evaluation of the health and education of Arizona children and adolescents.

About This Report

This report is the result of collaboration between the Arizona Department of Health Services, Arizona Department of Education (ADE), and the Arizona Health Care Cost Containment System (AHCCCS). Collaboration between these agencies was fueled by the pandemic, centered on the need to focus on student health outcomes. The Arizona School Health and Wellness Coalition (ASHWC) fulfills this charge as a collaborative group of dedicated school health stakeholders, which include state, county, and city level organizations, community members, parents, and other stakeholders whose primary role is to assist schools in creating healthy school environments. ASHWC was previously operated by ADE's Comprehensive School Health and Wellness team, but is now facilitated by ADHS. ASHWC's mission is to improve health and wellness through schools by being a data informed, multispectral, and collaborative resource for schools and communities around the state. ASHWC is required to:

- Coordinate addressing other school health priorities for the state,
- Increase public and decision-maker awareness of chronic health conditions and the evidence-based strategies and activities used to address disease, disability, and premature death,
- Support compliance with state and national standards and guidelines related to school-based health education, physical education/physical activity, healthy eating, and management of chronic health conditions,
- Promote healthy schools through policy, practices, and programs.

The central organizing principle of this report is the Whole School, Whole Community, Whole Child (WSCC) model. The CDC has provided a framework for school health through the Whole School, Whole Community, Whole Child (WSCC) model (see figure 1 on next page).[4] The implementation of WSCC relies on a collaborative approach centered on the child and supported by the community. Ten components provide an interconnected foundation for overall health and safety which can be self-assessed using the School Health Index (SHI), an accompanying tool that allows for a more thorough examination of policy, process, and practice. Identification of gaps and needs in school health are key outcomes of the SHI, which lead to the development of action plans that are low-cost and high-feasibility in their implementation. Likewise, the identification of gaps and needs within this report can be connected to any of the ten components.

[4] Centers for Disease Control and Prevention. (2021, March 23). *Whole School, Whole community, Whole child (WSCC)*. Centers for Disease Control and Prevention. Retrieved June 21, 2022, from https://www.cdc.gov/healthyschools/wscc/index.htm

Figure 1

Topic areas from this assessment will be coded and connected to these components, and may overlap with more than one area. Coding is as follows:

• Health Education - **HE**	• Social & Emotional Climate - **SEC**
• Physical Education & Physical Activity - **PEPA**	• Physical Environment - **PEnv**
• Nutrition Environment & Services - **NES**	• Employee Wellness - **EW**
• Health Services - **HS**	• Family Engagement - **FE**
• Counseling Psychological & Social Services - **CPSS**	• Community Involvement - **CI**

Throughout this needs assessment, opportunities for policy, programming, and additional data gathering are discussed. Initial analysis shows a significant need for improved qualitative data gathering related to the various health behaviors and outcomes presented. Policy recommendations reflect areas where examination of gaps or potentially harmful practices have demonstrated negative health outcomes for school-aged children. Programming recommendations reflect state level gaps in service provision at the systems level and opportunities to close these gaps through strategic partnerships.

A summary of the identified data gaps and brief explanation of the major data sources used for this report can be found in Appendix I of this report. Appendix II maps the WSCC model to the school-aged health topic areas outlined in Section Three of this report. And finally, Appendix III consists of a Glossary of Key terms used in this report.

Section Two: Elements of Health and Wellbeing

School-Aged Children Population Characteristics

A growing population and increasing demographic diversity continue to shape the constituency of Arizona. According to 2020 Census data, Arizona was among the top 10 states in the US to experience population growth. Between 2010 and 2020, the population increased 10.62% to total 7,151,502 people, mostly due to domestic migration. Geographically, rural areas constitute the vast majority of the state, while only 4.7% (338,332 of 7,151,502) of residents live in rural areas (USDA-ERS). The population density of various jurisdictions can add to the complexity of access to resources like healthcare, adequate nutrition, transportation, and opportunities for physical activity.

Arizona children of color make up the majority of the children population under age 18. The Arizona Department of Education reports a total of 1,097,762 students enrolled in K–12 grades. Out of the total student population in Arizona in 2021, nearly half (45.42%) identified as Hispanic/Latino 37.05% identified as White, 5.2% as Black, 5.13% as having multiple races, 4.11% as Native American, 2.82% Asian, 0.3% as Pacific Islander. According to Census data from 2020, approximately 31% of Arizonans speak Spanish, the most common of many other languages spoken in our state. A key consideration is the 22 sovereign Tribal Nations currently identified in the originally indigenous land of Arizona. Data from these sovereign Nations are not always required to be reported to ADHS. Better consultation in partnership with Arizona Tribal Nations and Indian Health Services (IHS) is recommended to comprehensively support health concerns for indigenous populations.

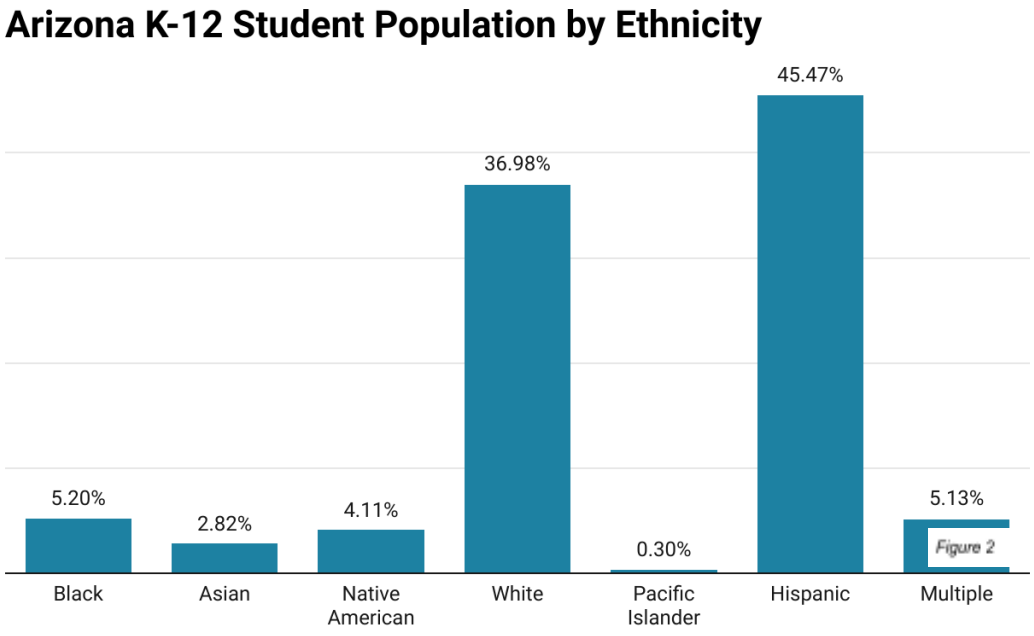

Figure 1.1

An estimated 20% of all Arizona students met the definition for Children and Youth with Special Healthcare Needs (CYSHCN), a population which requires additional resources and accommodations. The Health Resources and Services Administration (HRSA) defines CYSHCN as “children who have or are at increased risk for chronic physical, developmental, behavioral, or emotional conditions.” Furthermore, these children also “require health and related services of a type or amount beyond that required by children generally.” Public school data reported to the U.S. Department of Education during the 2018–2019 school year shows that an estimated 21,062 public school students experienced homelessness over the course of the year. Of that total, 602 students were unsheltered, 2,462 were in shelters, 1,975 were in hotels/motels, and 13,307 were doubled up.[5] Out of the total student population in Arizona in 2021, nearly half (45.42%) identified as Hispanic/Latino 37.05%. Approximately 84,800 students were tested for English Language Proficiency with the AZELLA tool of which 81.2% identified as Hispanic/Latino. Graduation rates decreased from 2020 (79.2%) to 2021 (78.19%), and dropout rates were reported to have increased from 3.93% in 2019 to 4.48% in 2021.[6] Preceding the pandemic, eligibility for free and reduced lunch in the 2017–18 school year was 55.1%, decreasing slightly to 53.7% in the 2018–19 school year. More recent data on rates of free and reduced lunch program participation is unreliable because eligibility was extended to all students during the COVID pandemic.

The Social Determinants of Health - **SEC**[7]

The conditions in which people are born, grow, work, live, and age are referred to as the Social Determinants of Health (SDoH), and they can have a profound impact on our health and well-being. The SDoH puts individual health behaviors within the larger context in which an individual makes health choices. As defined by the CDC, social determinants can be thought of broadly as: access to quality education, access to quality healthcare, neighborhood and built environment, social and community context, and economic stability (see fig. 1.2). Current research outlining the correlation between an individual’s census tract and how long they live illustrates how these concepts directly impact public health.[8] One of the social

Figure 3

[5] *Arizona homelessness statistics*. Homeless in Arizona Statistics 2019. Homeless Estimation by State | US Interagency Council on Homelessness. (n.d.). Retrieved July 7, 2022, from https://www.usich.gov/homelessness-statistics/az/

[6] AZED. (n.d.). Retrieved 2022, from https://azreportcards.azed.gov/state-reports.

[7] Graphic from- Healthy People 2030, U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. Retrieved 12/21/22, from https://health.gov/healthypeople/objectives-and-data/social-determinants-health

[8] *Centers for Disease Control and Prevention*. (n.d.). Retrieved July 6, 2022, from https://www.cdc.gov/nchs/data/series/sr_02/sr02_181.pdf

determinants, education access and quality, directly links public health and education. According to the CDC, people with higher levels of education are more likely to be healthier and live longer. Conversely, children from low-income families, children with disabilities, and children who routinely experience forms of social discrimination — like bullying — are more likely to struggle with math and reading. [9] A major data gap around the collection of SDoH data as it pertains to children and youth with special healthcare needs (CYSHCN) exists. Joint data collection and program planning, which is inclusive of the SDoH, are opportunities for public health practitioners and educators to collaborate on creating healthy and supportive school environments.[10,11]

Risks and Protective Factors[12], Adverse Childhood Experiences, and the Social-Ecological Model - SEC

Risk Factors "are characteristics at the biological, psychological, family, community, or cultural level that precede and are associated with a higher likelihood of negative outcomes," as defined by the Substance Abuse and Mental Health Services Administration (SAMHSA).

Protective Factors "are characteristics associated with a lower likelihood of negative outcomes or that reduce a risk factor's impact. Protective factors may be seen as positive countering events," as defined by SAMHSA.

Understanding risk and protective factors is vital because risk factors are typically positively correlated with one another and negatively correlated with protective factors. Alternatively, when someone experiences one risk factor, they are more likely to experience several and less likely to experience protective factors. Children and adolescents who experience several risk factors have a higher risk of developing conditions that impact their mental and physical health while those with multiple protective factors are less likely to do so. Specific components of risk and protective factors highlight the need for early interventions when designing and evaluating health programs and contemplating healthy school environments.

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[9] Education Access and Quality. Education Access and Quality - Healthy People 2030. (n.d.). Retrieved December 23, 2022, from https://health.gov/healthypeople/objectives-and-data/browse-objectives/education-access-and-quality

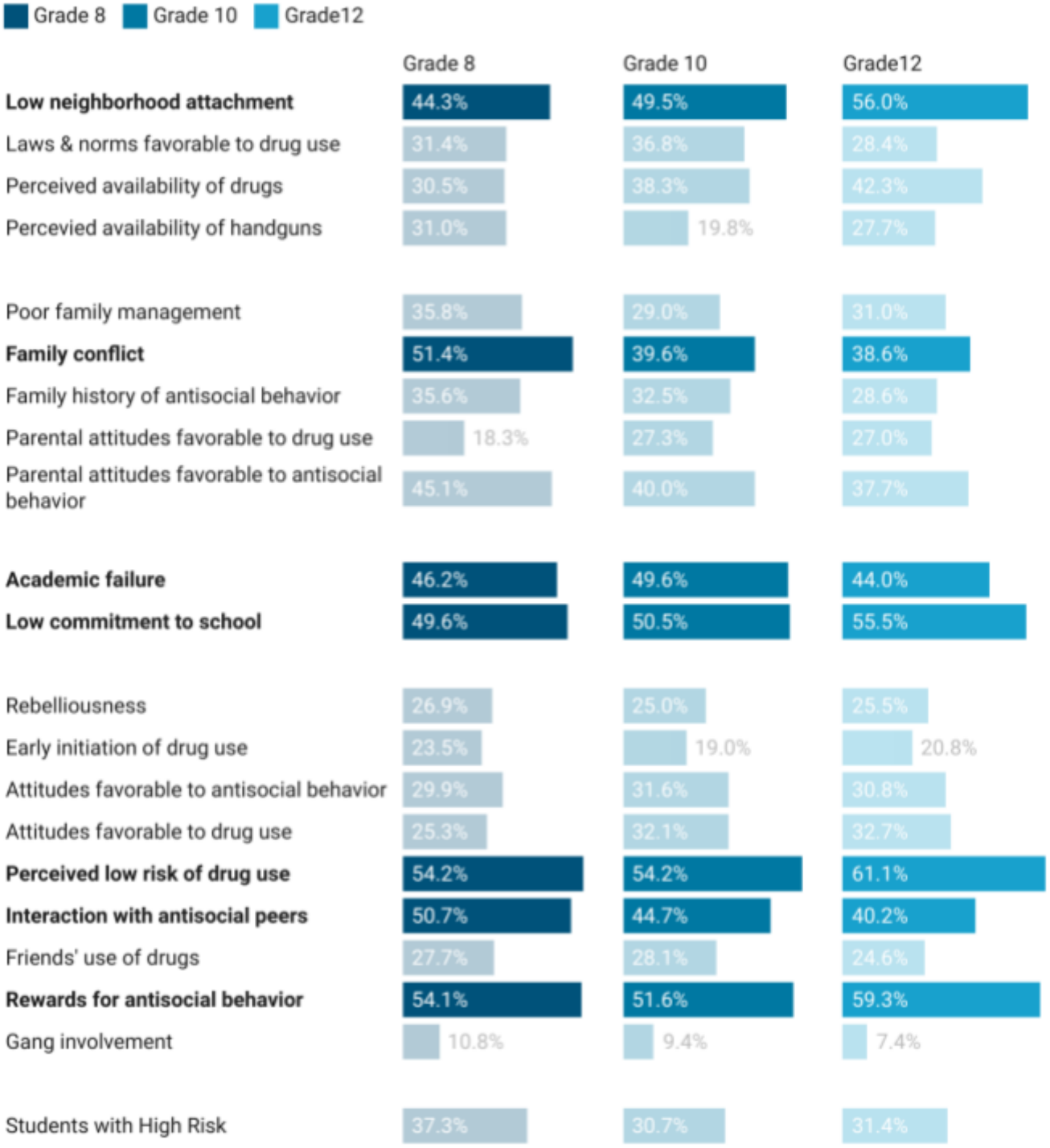
[10] Richardson LD. Integrating Health Equity Into Practice and Policy. J Public Health Manag Pract. 2016 Jan-Feb;22 Suppl 1:S107-9. doi: 10.1097/PHH.0000000000000372. PMID: 26599023.

[11] Van Cleave, J., Taft, K., Ware, A., & Stille, C. (2022). Assessing and addressing social determinants of health among children and Youth With Special Health Care Needs. Academic Pediatrics, 22(2). https://doi.org/10.1016/j.acap.2021.07.006

[12] Substance Abuse and Mental Health Services Administration. (2019, July 18). Risk and Protective Factors.

Percentage of Students Experiencing Risk Factors 2020 AYS

Arizona Youth Survey (AYS)



Factors of high concern and prevelancy are in bold

Chart: Rebekah Kamer • Source: Arizona Criminal Justice Commission • Created with Datawrapper

Figure 4

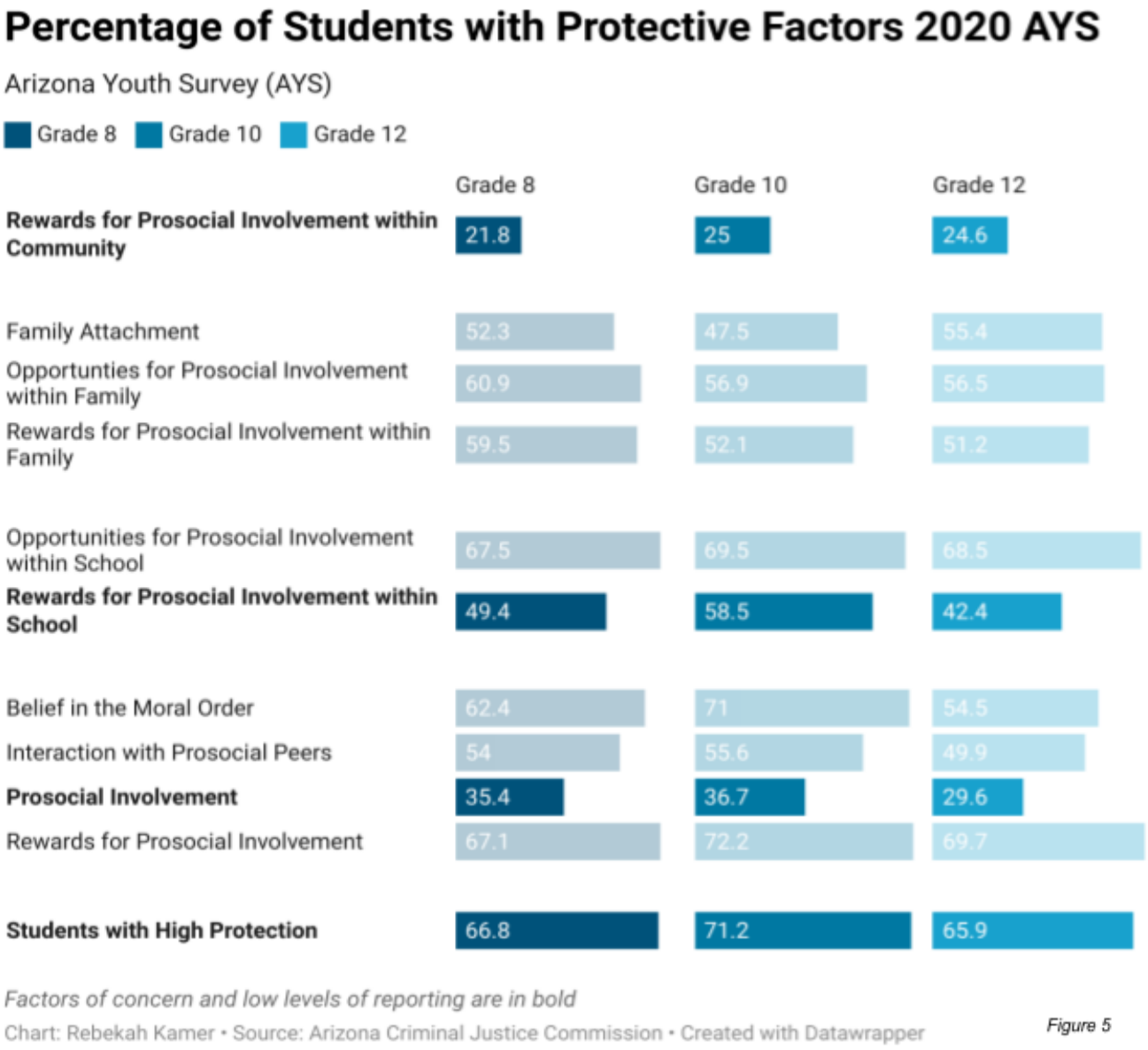


Figure 5

Above are the self-reported percentages of students experiencing specific risk and protective factors collected by the Arizona Youth Survey (AYS). The most common risk factors experienced by adolescents in Arizona are highlighted above with prevalence being reported in over 40% of all students. Additionally, approximately 34% of all students are classified as high risk. High risk is defined by the Arizona Criminal Justice Commission as an individual who experiences 8 or more risk factors by 8th grade and 9 or more risk factors by 10th and 12th grades. The lowest reported protective factor experienced by Arizona youth includes rewards for prosocial involvement within the community.

The U.S. Department of Health and Human Services (HHS) links the framework of protective factors to the framework of Adverse Childhood Experiences (ACEs).[13] ACEs are negative experiences in childhood that cause increased risk for negative outcomes in adulthood, some of which include substance use, chronic health problems, and mental illness. Studies have also found that ACEs also "…impact education attainment, employment, and income."[14] ACEs include all types of abuse and neglect, parental substance use or mental illness, parental incarceration, domestic violence, and divorce. According to the National Survey of Children's Health, in combined 2019–2020 data sets, *Arizona was ranked 43rd out of 50 states for children exposed to 2 or more ACEs*. An estimated 22% of children 17 or under in Arizona have experienced 2 or more ACEs. This estimate increases as children age. As the number of ACEs an individual has increases, the risk for adverse life outcomes also increases. Certain populations report a disproportionate number of ACEs, which must be taken into consideration to guide appropriate prevention and mitigation. For example, 24% of Children and Youth with Special Health Care Needs (CYSHCN) experienced one ACE compared to their counterparts (21%). Additionally, CYSHCN were more than twice as likely to experience 2 or more ACEs than their counterparts (40% vs. 18%). Generational trauma is another factor to consider as children of parents who report ACEs are more likely to also experience traumatic events. For the purpose of this report, it is important to note the difference between children with primary caregivers who have attained a college degree or higher (66% reporting no ACE) and children of primary caregivers who had a high school diploma or GED (46% reporting no ACE). These and other factors link the social determinants of health (education access and economic stability) to ACEs. This data strongly indicates the need to prevent and mitigate the impact that ACEs have on K–12 children.

Co-Occurences of ACEs in Adolescents (12-17 years), Arizona, 2019-2020

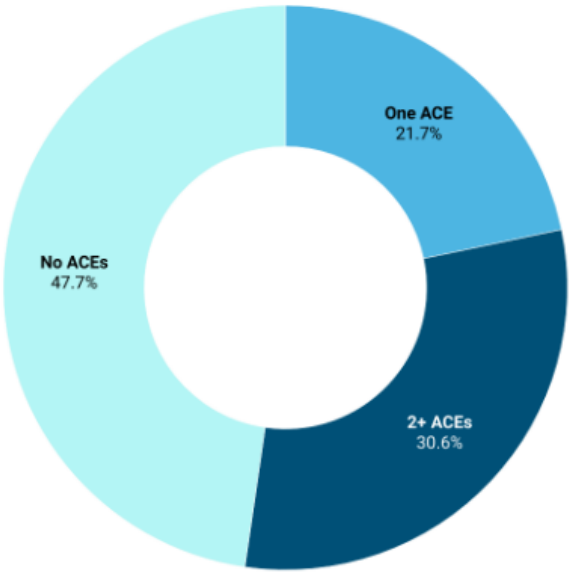


Chart: Rebekah Kamer • Source: National Survey on Children's Health • Created with Datawrapper

Figure 6

[13] *Protective factors and ACEs - National Child Abuse Prevention Month - Child Welfare Information Gateway*. Protective Factors and ACEs - National Child Abuse Prevention Month - Child Welfare Information Gateway. (n.d.). Retrieved July 11, 2022, from https://www.childwelfare.gov/topics/preventing/preventionmonth/about/protective-factors-aces/#:~:text=A%20landmark%20study%20in%20the,the%20risk%20for%20these%20outcomes

[14] Arizona Department of Health Services. (2019, June). ADHS Adverse Childhood Experiences Action Plan. Phoenix.

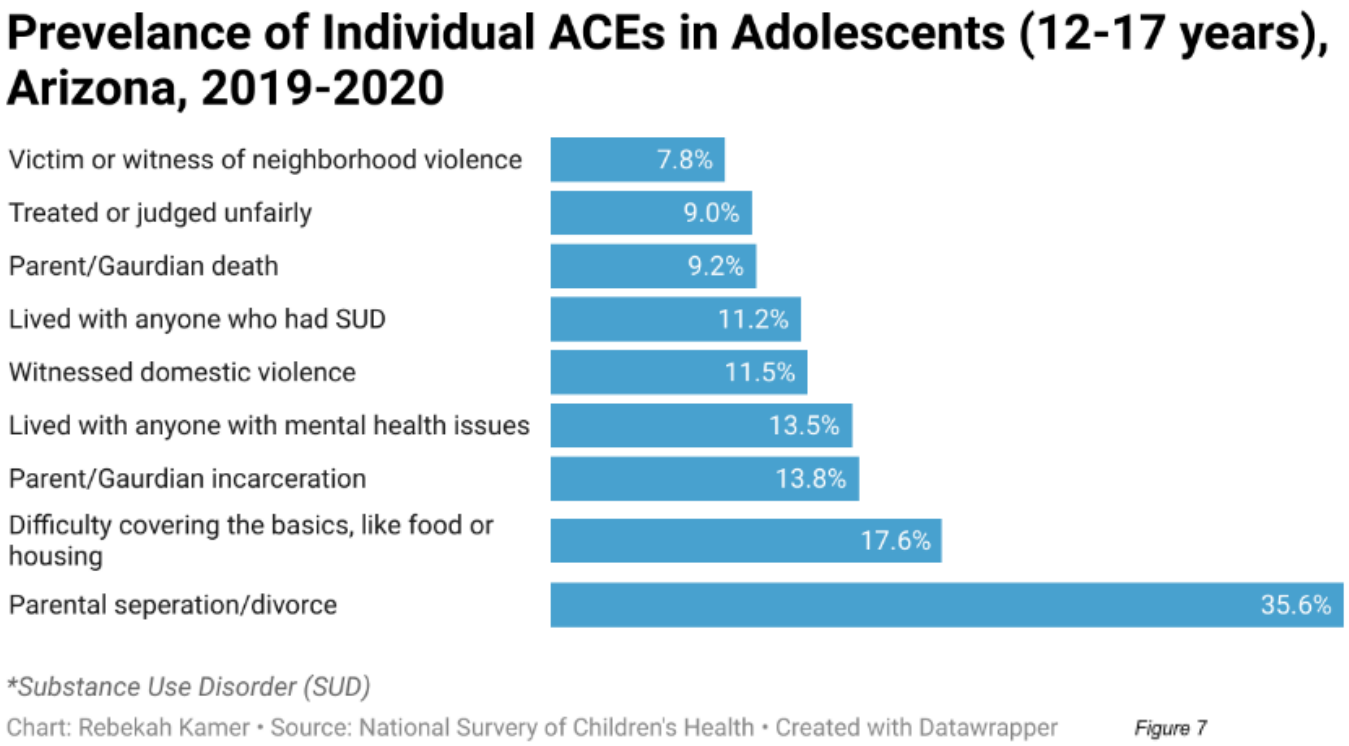


Figure 7

The Social-Ecological Model - SEC / FE / CI

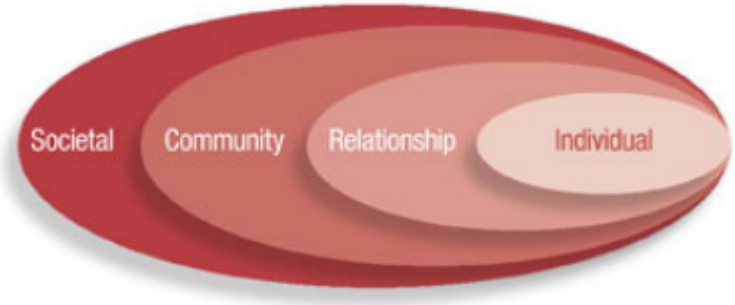


Figure 8 The Social-Ecological Model: A Framework for Prevention

The Social-Ecological Model (figure 1.7) provides a framework to address violence prevention across individual, relationship, community, and societal levels. It allows us to understand the range of factors that put people at risk for violence or protect them from experiencing or perpetrating violence. The overlapping rings in the model illustrate how factors at one level influence factors at another level. As the CDC cites in *Preventing Adverse Childhood Experiences*, "ACEs and associated social determinants of health, such as living in under-resourced or racially segregated neighborhoods, frequently moving, and experiencing food insecurity, can cause toxic stress."[15] The connections between Social Determinants, ACEs, and Risk and Protective Factors and how health factors for school-age children manifest is important to keep in mind when reviewing this assessment.

[15] Centers for Disease Control and Prevention. (2022, April 6). Fast facts: Preventing adverse childhood experiences |violence prevention|injury Center|CDC. Centers for Disease Control and Prevention. Retrieved July 6, 2022, from https://www.cdc.gov/violenceprevention/aces/fastfact.html

Section Three: School-Age Child Health By Topic Area

Motor Vehicle Safety - **HE / PEnv**

Driving is a critical part of the Arizona high school experience. The Arizona Center for Student Opportunity cites that less than 25% of students in Arizona take a bus for transportation to school. Several school districts report that among students taking the bus, 10 to 15% are of high school age.[16] One study showed significant differences in bussing between rural and urban districts in 29 of the 31 school districts evaluated.[17] Motor vehicle crashes are the leading cause of "preventable" death for individuals 0–17 years of age in Arizona with all deaths from motor vehicle crashes classified as preventable. In 2020, of the 336 fatalities in youth (5–17 years), 78 were due to motor vehicle crashes. This totals almost one-quarter of the deaths in this age range.[18] Behaviors that significantly reduce preventable collisions have been researched at the local, national, and global levels allowing for abundant opportunities to reduce the frequency and severity of motor vehicle collisions. The preventable factors that contribute to the mortality and morbidity of youth include lack of seat belt use, reckless driving, excessive speed, inexperience behind the wheel, and substance use while driving.[19] Figure 1.8 below shows the increase in motor vehicle crash passenger death between 2011 and 2020.

[16] Eller, B., & Ajo Unified School District Transportation Manager. (2022). personal.
[17] Howley, C. B., & Howley, A. A. (2001). Riding the School Bus: A Comparison of the Rural and Suburban Experience in Five States. *Journal of Research in Rural Education*, *17*(1), 41–63. https://doi.org/http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.514.5881&rep=rep1&type=pdf
[18] Griffin, A., Garlington, T., Indatwa, A., Celaya, M., & Perfette, J. (2021, November 15). Arizona Child Fatality Review Program: Twenty-Eighth Annual Report. Phoenix; Arizona Child Fatality Review Team.
[19] Griffin, A., Garlington, T., Indatwa, A., Celaya, M., & Perfette, J. (2021, November 15). Arizona Child Fatality Review Program: Twenty-Eighth Annual Report. Phoenix; Arizona Child Fatality Review Team.

Mortality Rate per 100,000 Children due to Motor Vehicle Crashes in Arizona by Gender, Ages 0-17

Data includes children ages 0-4 who are outside the population range of this report. Data does not capture 18-19 year olds who are apart of the population range of this report.

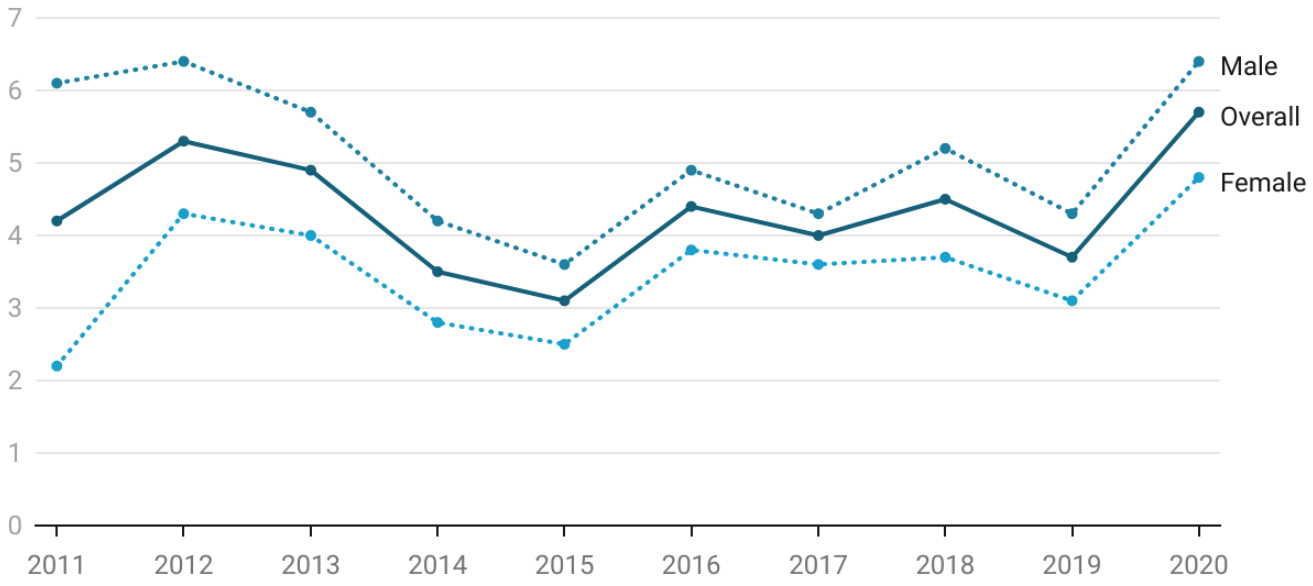


Chart: Rebekah Kamer • Source: Arizona Childhood Fatality Review 2020 Report • Created with Datawrapper

Figure 9

Young drivers are overrepresented in the population of drivers involved in motor vehicle crashes largely due to their inexperience and lack of necessary driving skills.[20] Driving instruction from a formal Driving Course or from a licensed adult has been the primary method used to ensure adolescent drivers are equipped with the needed skills and capabilities to operate a motor vehicle safely. However, empirical evidence shows that this is not the most effective method. Several studies have failed to prove the positive effect of formal driver education with some suggesting that these education programs pose a risk as they often lead to earlier licensure. Several research institutions have reached the same conclusion. Recently, the John Hopkins school of Public Health concluded that:

> There is no convincing evidence that high school driver education reduces motor vehicle crash involvement rates for young drivers, either at the individual or community level. In fact, by providing an opportunity for early licensure, there is evidence that these courses are associated with higher crash involvement for young drivers.

[20] Gillan, J. S. (2006). Legislative advocacy is key to addressing teen driving deaths. *Injury Prevention*, *12*(suppl_1), i44–i48. https://doi.org/10.1136/ip.2006.012880

Research has shown that the implementation of graduated licensing reduces the incidences of adolescent car crashes. Currently, adolescents in Arizona may obtain a Graduated Instruction Permit if they:[21]

- Are at least 15 years and 6 months of age,
- Pass a written and vision test; the written test may be taken at home under the supervision of a parent or legal guardian, and
- Have a licensed driver at least 21 years of age in the passenger seat with them at all times when operating a motor vehicle.

Adolescents may obtain a Graduated Driver License in Arizona if they:

- Are at least 16 years of age,
- Have held a driving permit for at least 6 months, and
- Meet the following practice requirements:
    - Complete 30 hours of supervised driving: 10 of those hours must be at night, or
    - Complete 20 hours of supervised driving: 10 of those hours must be at night AND complete a driver education program by a school certified by the Arizona Supreme Court.

While Arizona has implemented graduated licensure for teen drivers, the requirements could be stronger. Other states in the US require 50 hours of supervised driving and the mandatory completion of a certified driver education program. While both states implement Graduated Driver License (GDL) laws, Washington and Utah have stricter and more numerous GDL laws than Arizona resulting in their better teen driver outcomes.[22] While both states implement Graduated Driver License (GDL) laws, Washington and Utah have stricter and more numerous GDL laws than Arizona resulting in their better teen driver outcomes. The National Institutes of Health supports claims that GDL programs in combination with laws reduce fatal teen crashes.[23]

Trends in Self-Reported Youth Motor Vehicle Safety - Youth Risk Behavior Survey (YRBS) 2019

Below are the key takeaways from the 2019 YRBS regarding adolescent motor vehicle safety. The data points to both positive and negative trends in youth motor vehicle safety in Arizona. Further evaluation is needed to better understand the causes of these changes.

- The percentage of students who regularly do not wear a seatbelt has decreased from 13.4% in 2009 to 8.6% in 2019.

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[21] Arizona Department of Transportation. (2022). *Permit and License Requirements*. Permit and License Requirements | ADOT. Retrieved April 14, 2022, from https://azdot.gov/motor-vehicles/driver-services/teen-drivers/permit-and-license-requirements

[22] Federico E. Vaca, Kaigang Li, James C. Fell, Denise L. Haynie, Bruce Simons-Morton, Eduardo Romano, *Associations between Graduated Driver Licensing restrictions and delay in driving licensure among U.S. high school students*, Journal of Transport & Health, Volume 21, 2021, 101068, ISSN 2214-1405, https://doi.org/10.1016/j.jth.2021.101068.

[23] Bock, R., & McGrath, J. (2015, September 18). *Graduated drivers licensing programs reduce fatal teen crashes*. National Institutes of Health. Retrieved December 27, 2022, from https://www.nih.gov/news-events/news-releases/graduated-drivers-licensing-programs-reduce-fatal-teen-crashes

- The percent of students who rode in a vehicle with a driver who had been drinking alcohol (at least once during the 30 days prior to self-reporting) has only been tracked in the YRBS in 2017 and 2019 in which the rates were 19.2% and 18.4% respectively.
- Prevalence of teens driving after they have been drinking alcohol has decreased from 9% in 2013 to 5.4% in 2019 (of those who had reported driving a vehicle).
- Male adolescents are more likely than their female counterparts to drive a motor vehicle after drinking alcohol.
- Hispanic/Latino adolescents are more likely to drive a motor vehicle after drinking alcohol than their White peers.

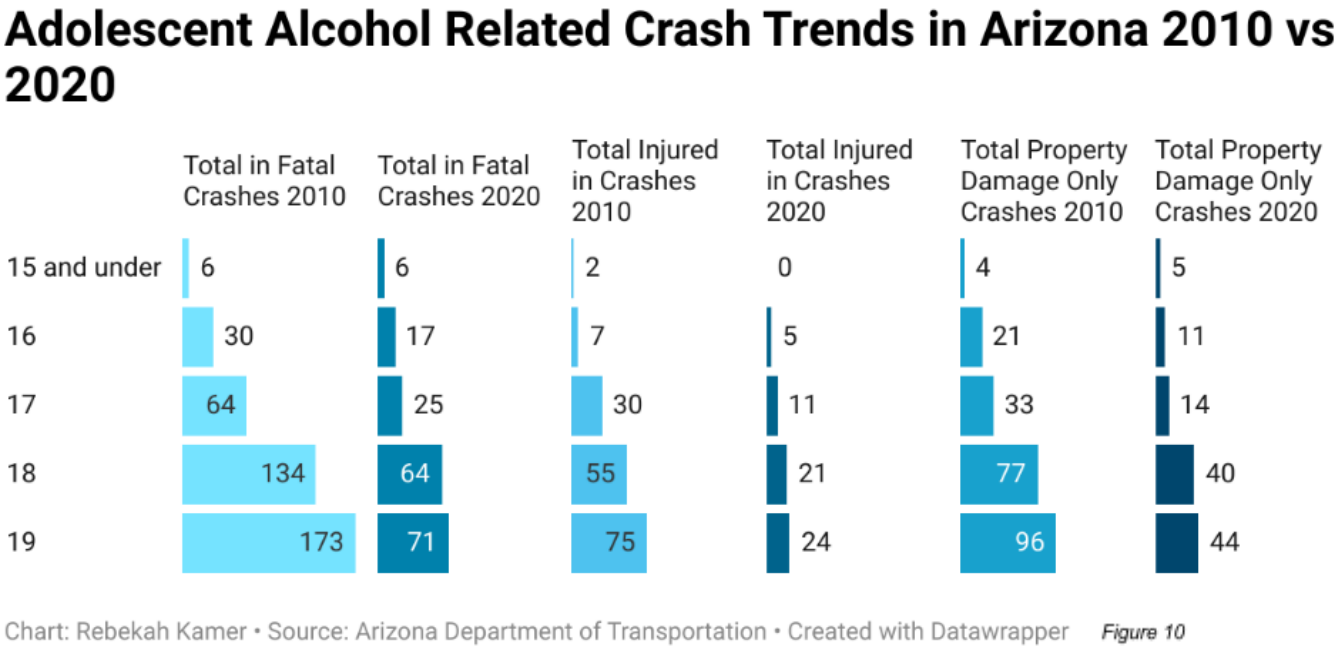

Figure 10

Figure 1.9 explores the number of adolescents behind the wheel in motor vehicle crashes while under the influence of alcohol. There are three categories: fatal crashes, injured in crashes, and crashes only resulting in property damage. These categories were evaluated between 2010 and 2020. In 2008, Arizona began implementing the Teenage Driver Safety Act, which established the licensure standards for Arizona youth drivers currently in place now. There is likely a correlation between the new laws and the decreases in all crash categories seen above. Studies have cited decreased driving habits in teens during the pandemic, [24,25] which could be a contributing factor in the decline.

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[24] Stavrinos, D., McManus, B., Mrug, S., He, H., Gresham, B., Albright, M. G., Svancara, A. M., Whittington, C., Underhill, A., & White, D. M. (2020, September). *Adolescent driving behavior before and during restrictions related to COVID-19*. Accident; analysis and prevention. Retrieved December 28, 2022, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7364168/

[25] Dadashzadeh N, Larimian T, Levifve U, Marsetič R. Travel Behaviour of Vulnerable Social Groups: Pre, during, and Post COVID-19 Pandemic. Int J Environ Res Public Health. 2022 Aug 15;19(16):10065. doi: 10.3390/ijerph191610065. PMID: 36011698; PMCID: PMC9407727.

Sexual and Reproductive Health - **HE / CPSS / SEC**

The World Health Organization defines Adolescent Reproductive Health as encompassing physical, mental, and social well being in all matters pertaining to the reproductive system of youth between the ages 10 and 19.[26] Adolescent sexual health, as defined by the CDC, includes topics such as self-esteem, sexual assault/coercion, learning to navigate risk taking, sexually transmitted infections (STIs), contraception, teen pregnancy, and more.[27] Comprehensive sexual and reproductive health education does not focus solely on sexual activity; it promotes evidence-based, positive youth development aligned with national health standards. Age-appropriate information regarding adolescent sexual and reproductive health, building healthy relationships, career and adulthood skill building, empathy building, and risk behavior prevention are all part of the standards for comprehensive health education and are recommended for instruction.[28] Age appropriate sexual and reproductive health education for adolescents allows students to receive accurate, evidence-based information to promote safer choices and healthier outcomes such as fewer unplanned pregnancies and lower instances of STIs.

Arizona is one of only six states that has an opt-in sex education policy. Arizona Administrative Code R7-2-303 allows schools to provide “specific elective lesson or lessons concerning sex education as a supplement to the health course of study” if they choose to do so. Schools that do so must have parent or guardian written consent to provide sex education and their curriculum approved by the school’s local governing board. All sex education material must: stress abstinence as the only 100% effective way of preventing pregnancy; that students should abstain from sexual intercourse until they are adults; stress that sexually transmitted diseases have severe consequences and constitute a serious and widespread public health problem; discuss the impacts that teen-pregnancy has on adolescents; and advise pupils of Arizona law pertaining to the financial responsibilities of parenting and legal liabilities related to sexual intercourse with a minor.[29] Additional requirements from the Administrative Code that outline public review and comment timelines relating to parental consent were recently passed in 2022 through HB 2161. This law stipulates the need for written, informed parental consent before administering any survey about “sexual behavior and attitudes”, along with 13 other content areas that contribute to trends and evaluation of risk behaviors for youth.

Systematically disadvantaged populations are disproportionately affected by sexual health topics and have higher rates of pregnancy, abortions, miscarriages, and sexually transmitted infections (STIs), including correlated cancers. These populations include but are not limited to people of color, women, people living in poverty, people who identify as LGBTQIA2S+, and individuals living in rural areas. Negative health outcomes are reduced significantly with education and resources that address

[26] World Health Organization. (2022). *Reproductive health*. World Health Organization. Retrieved December 28, 2022, from https://www.who.int/westernpacific/health-topics/reproductive-health
[27] Centers for Disease Control and Prevention. (2020, February 3). Adolescent Sexual and Reproductive Health.
[28] Health education standards and resources. Arizona Department of Education. (2022, July 11). Retrieved July 19, 2022, from https://www.azed.gov/pe/health-education
[29] Sex Education Collaborative. (2022). *State Sex Education Policies and Requirements at a Glance*. Arizona. Retrieved April 1, 2022, from https://sexeducationcollaborative.org/states/arizona

comprehensive sexual health. Research finds that when sexual and reproductive health education includes information about contraception, adolescents begin having sex at a later age, and when they do become sexually active, they have healthier relationships (e.g., experience less domestic violence), contract fewer STIs, and avoid unintended pregnancies).[30]

Teen Pregnancy - **HE / CPSS / SEC / FE / CI**

While teen pregnancy rates are declining both nationally and in Arizona at a significant rate, there is no conclusive evidence as to why. Review of the available data from current teen pregnancy prevention programming in the U.S. and Arizona may point to a national decrease due to factors including increased self-reported use of contraceptives, fewer teens self-reporting being sexually active, accurate sexual health information available online, and increased accessibility of contraceptives and birth control such as condoms and IUDs. Below are key highlights of the current trends in teen pregnancy: [31] [32]

- In 2019, the teen pregnancy rate in Arizona dropped 57% from 28 pregnancies per 1,000 females in 2009 to 11.9 pregnancies per 1,000 females in 2019. Historically, pregnancy rates have declined among younger teenagers. However, since 2009, there are notable declines in pregnancy rates among all teenagers.
- The total number of births paid for by the Arizona Health Care Cost Containment System (AHCCCS, the State's Medicaid Program) decreased from 83.3% of teen births in 2009 to 81.4% in 2019.
- Teen pregnancy rates in Arizona remain higher than the national average as illustrated in figure 1.10 (pg. 21).

[30] Abrahams, J. (2011, May). Disaster Risk Management for Health: Sexual and Reproductive Health. World Health Organization.
[31] Santelli J, Lindberg L, Finer L, Singh S. Explaining recent declines in adolescent pregnancy in the United States: the contribution of abstinence and improved contraceptive use. *Am J Public Health*. 2007;97(1):150–6.
[32] Lindberg LD, Santelli JS, Desai S. Understanding the decline in adolescent fertility in the United States, 2007–2012. *J Adolesc Health*. 2016:1–7.

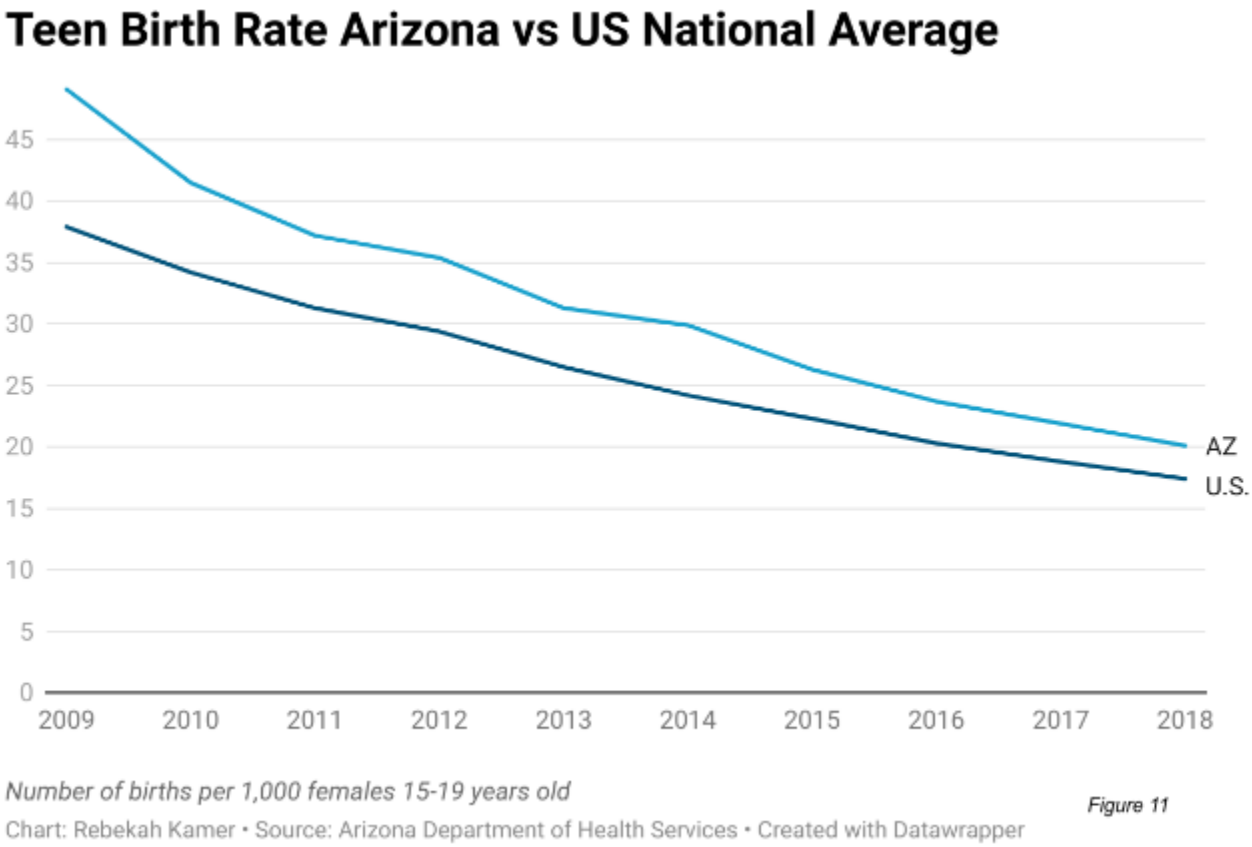

Figure 11

Costs of Teen Pregnancy[33]

- Teen mothers are less likely to finish high school and are more likely than their peers to live in poverty, rely on public assistance, and be in poor health.
- The children of teen mothers are more likely to suffer health and cognitive disadvantages, come into contact with child welfare programs, enter correctional facilities, live in poverty, drop out of high school, and become teen parents themselves.
- The average cost nationally to provide medical and economic support during pregnancy and the first year of infancy is $16,000 per teen birth.

[33] Kate Blackman, A. B. (2018, November 10). Teen Pregnancy Prevention. Teen pregnancy prevention. Retrieved December 22, 2022, from https://www.ncsl.org/research/health/teen-pregnancy-prevention.aspx

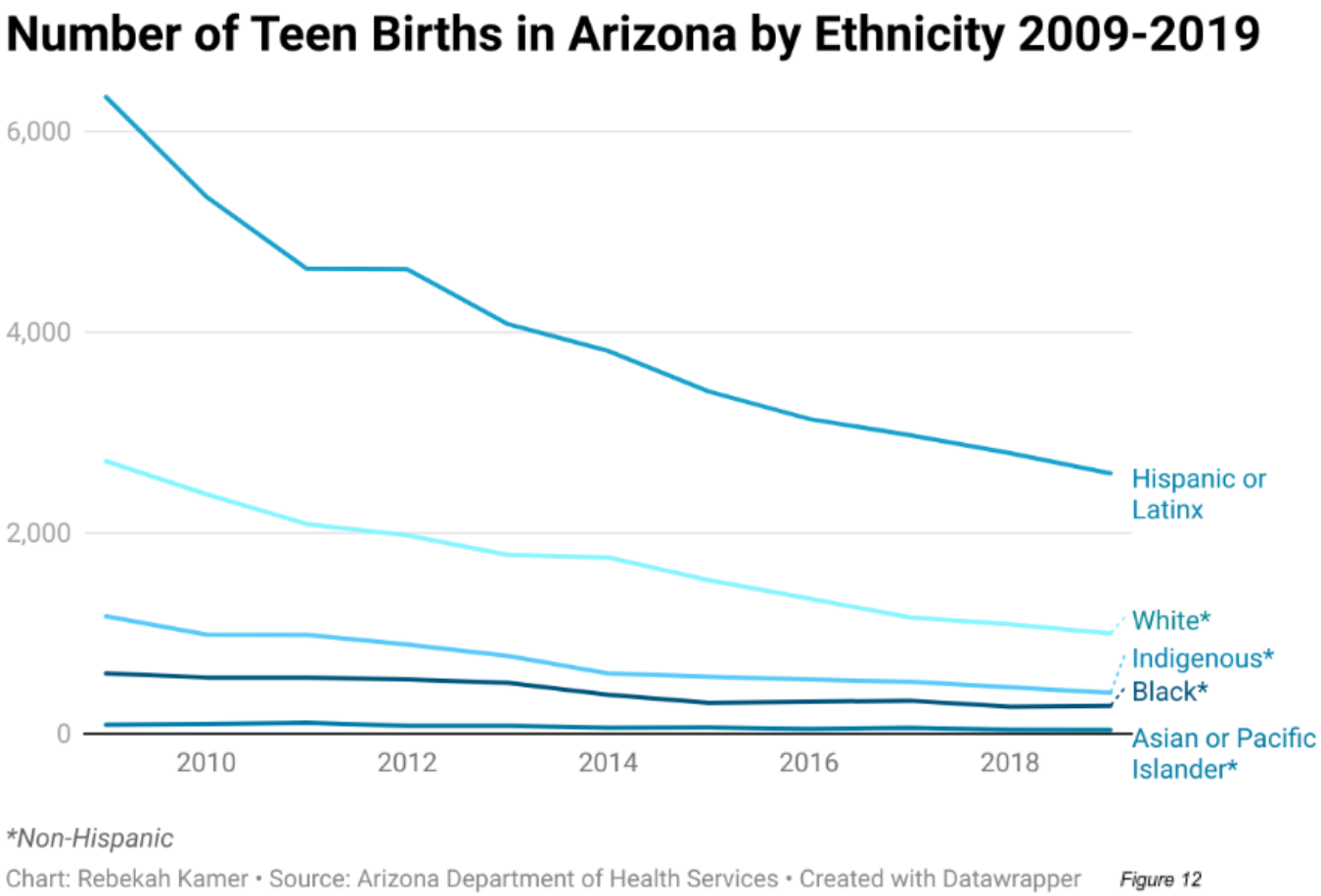

Figure 12

Arizona currently experiences teen pregnancy rates at a higher level than the national average. This may be due to a number of factors. Some factors include policy, like the state's opt-in sexual education policy, or restrictions on access to reproductive health services. Other factors include social determinants of health, which lay the groundwork for describing why certain populations experience disproportionate rates of teen pregnancy as compared to their counterparts. Even with these challenges, Teen Pregnancy Prevention Programs (TPP) continued delivering culturally relevant and age-appropriate, evidence-based, abstinence-based, and abstinence plus (sex education that includes information on abstinence, condom use, and contraception) curriculum services. In 2021, a total of 6,443 Arizona youth between the ages of 11–19 received curriculum instruction provided by TPP and 3,593 youth received Abstinence Plus educational services and 2,850 youth received Abstinence educational services. Funding from the state lottery and federal Personal Responsibility Education Program (PREP) and Sexual Risk Avoidance Education (SRAE) allowed TPP to support the 24 rural and urban programs statewide through County Health Departments and community-based organizations, including four organizations operating in Tribal lands. All TPP programming covers 3 of the following 5 Adulthood Preparation Subjects: (1) Healthy Relationships, (2) Healthy Life Skills, (3) Educational and Career Success, (4) Financial Literacy, and (5) Adolescent Development.

COVID-19 impacted all types of program delivery across the state, including teen pregnancy prevention. Contributing factors include reduced capacity of school staff to support “extra” programming, school shut-downs, and mitigation measures that prevented non-employees from being on campus. According to the 2021 Maternal and Child Health (MCH) annual report: ”Before COVID-19, contracted agencies provided services to over 30,000 youth each year. Services from 2019 to 2020 decreased by about 52% and TPP experienced yet another 55% decrease in numbers of youth served between 2020 to 2021. The flexibility afforded to sub-recipients at the height of COVID-19 helped in reaching Arizona’s youth population, especially those at highest risk for becoming pregnant and/or contracting an STD.” Despite challenges with COVID-19, three hundred and thirty-four parents participated in educational sessions providing information to help parents and guardians facilitate conversations with their youth on sexual health topics as well as other topics, such as fostering healthy relationships.

Sexually Transmitted Infections - **HE / CPSS / SEC / FE**

A Sexually Transmitted Infection (STI) is an infection caused by bacteria, parasites, or viruses such as HIV/AIDS, HPV, Chlamydia, Syphilis, etc. STIs can be transmitted through vaginal, anal, or oral sex, as well as by contact with bodily fluids or physical contact with an infected surface area. Some STIs can be cured while some are incurable. STIs have a wide variety of health consequences ranging from physical discomfort, blemishes, or warts, to more severe consequences like certain cancers, infertility, pelvic inflammatory disease (PID), hospitalization or even death. Mother-to-child transfer of STIs may result in maladies such as stillbirth, neonatal death, sepsis, premature birth, pneumonia, congenital deformities, and more. There are methods for preventing STI transmission for individuals engaging in sexual activity. Condoms, when properly used, are regarded as a highly effective barrier method to prevent STI transmission, but do not protect against STIs that cause extra-genital ulcers such as syphilis and herpesvirus. [34] Certain STIs, like Hepatitis B and human papillomavirus (HPV), and their associated cancers, can be prevented with safe and highly effective vaccines.

[34] Centers for Disease Control and Prevention. (2021, September 14). *Condom fact sheet in brief*. Centers for Disease Control and Prevention. Retrieved January 9, 2023, from https://www.cdc.gov/condomeffectiveness/brief.html

Condom Use During Last Sexual Intercourse in Arizona Adolescents 2011-2021

Data from students who self-reported being sexually active at least once in the last 30 days prior to the sruvey

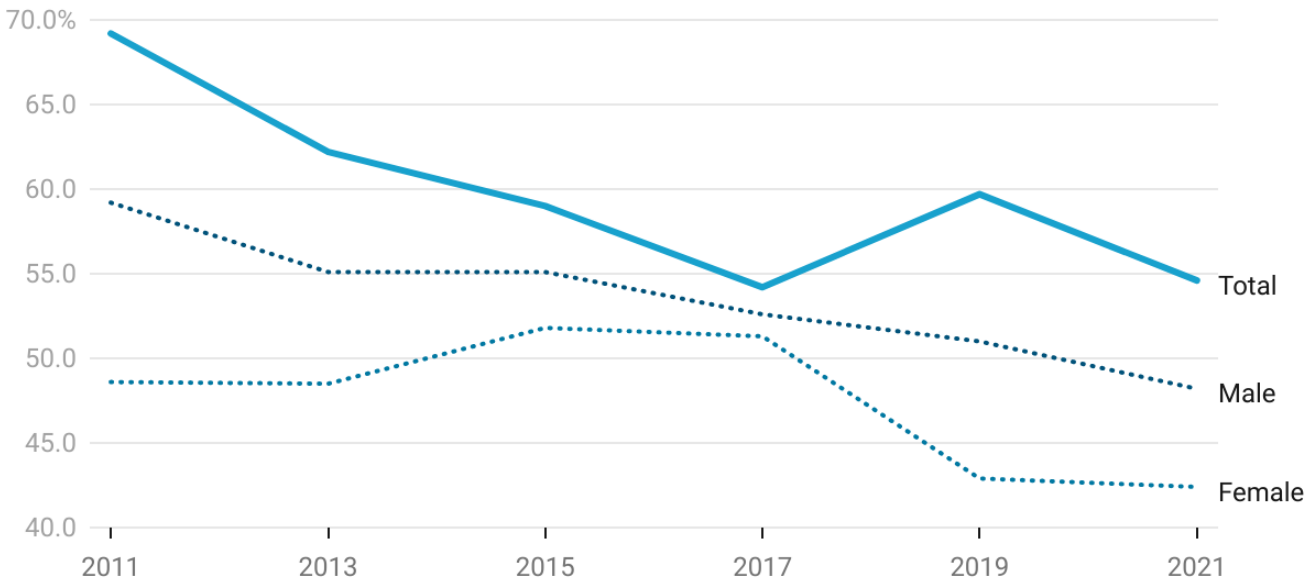

Chart: Rebekah Kamer • Source: Arizona Youth Risk Behavior Survey • Created with Datawrapper

Percentage of Students Who Used Birth Control Pills, IUD or Implant, Shot, Patch, or Birth Control Ring Before Last Sexual Intercourse

Data collected among students who reported having sexual intercourse at least once in the 30 days prior to the survey

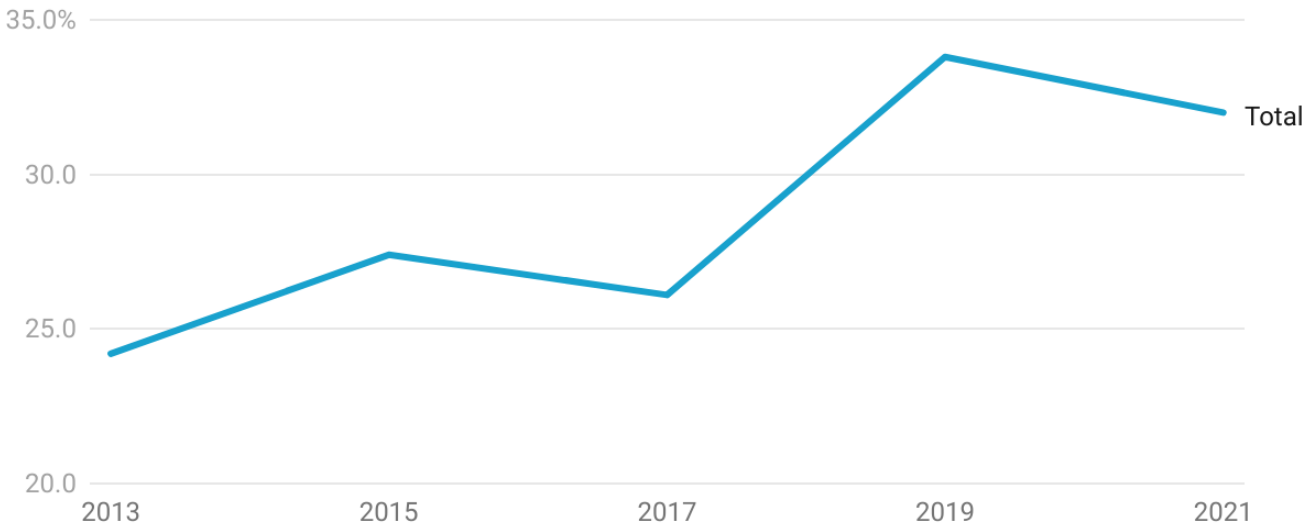

Chart: Rebekah Kamer • Source: Arizona Youth Risk Behavior Survey • Created with Datawrapper

Cases of STIs are on the rise in Arizona particularly among youth. While adolescents ages 15–24 years of age make up only about a quarter of the population, they account for roughly half of new STI cases. The graphs in figures 1.12 and 1.13 illustrate the need for STI prevention in the adolescent population in Arizona. The majority of new STI cases occur in people under the age of 25, with the most cases occurring in people 20 years of age.

Cases of STIs in Arizona by Age

60% of STIs occur in people under the age of 25

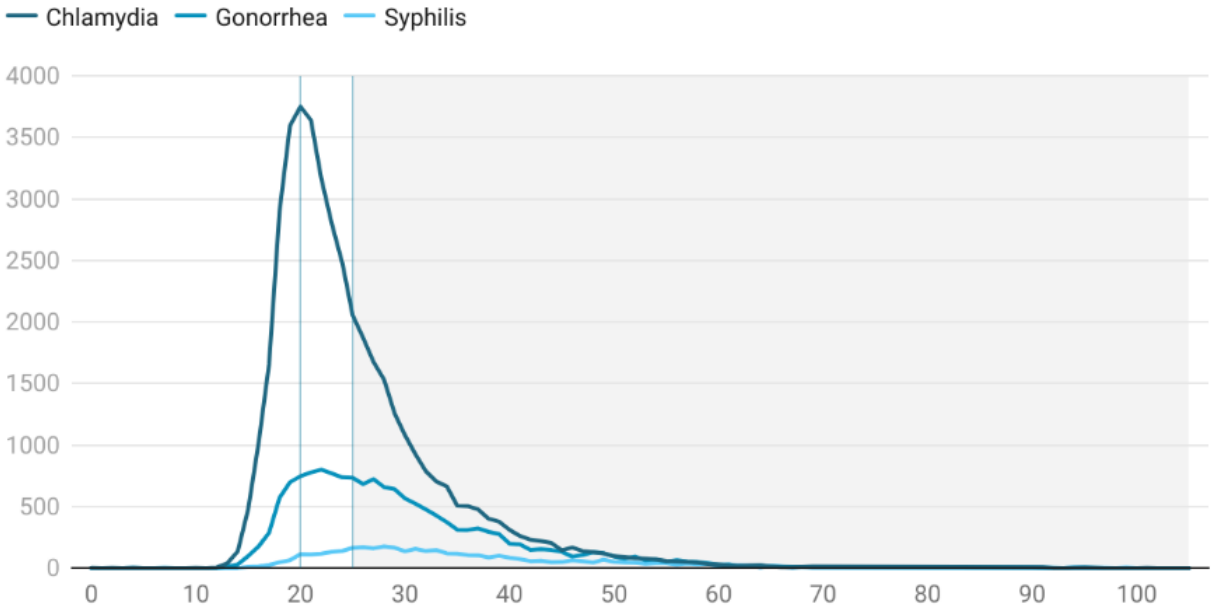

Chart: Rebekah Kamer • Source: ADHS 2019 STI Annual Report • Created with Datawrapper

Figure 13

Percentage of High School Students Who Were Currently Sexually Active*

*Had sexual intercourse with at least one person during the three months before the survey

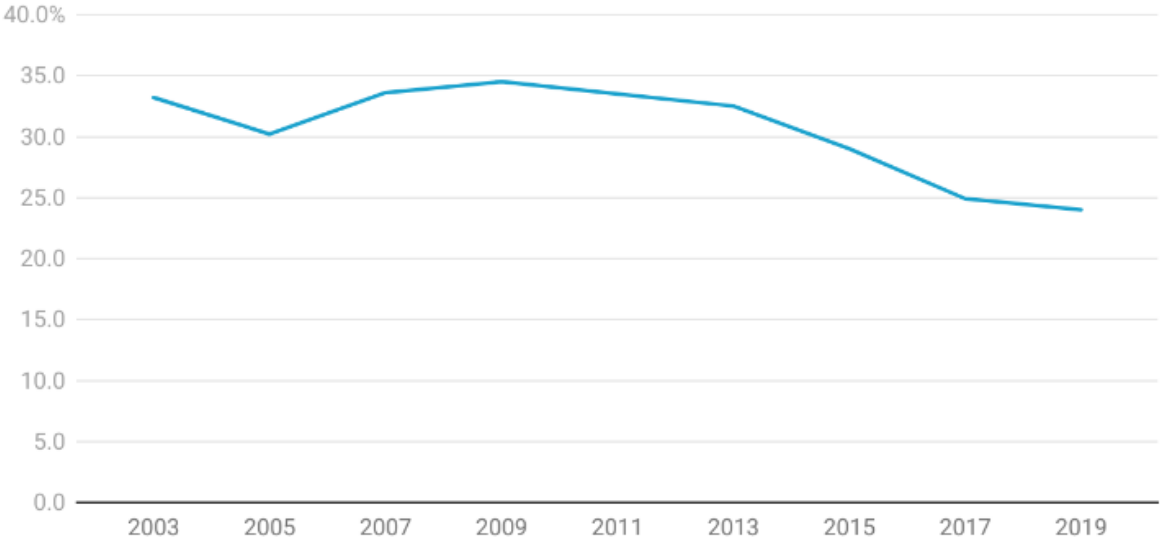

Chart: Rebekah Kamer • Source: Arizona Youth Risk Behavior Surveillance • Created with Datawrapper

Figure 14

The percentage of high school students in Arizona that are sexually active has decreased by almost 10%, but the rate of STI transmission continues to increase. Self-reported data from 2019 YRBS showed that most sexually active students (89.7%) use a condom or other primary contraceptive method, though only 54.3% reported condom use.[35]

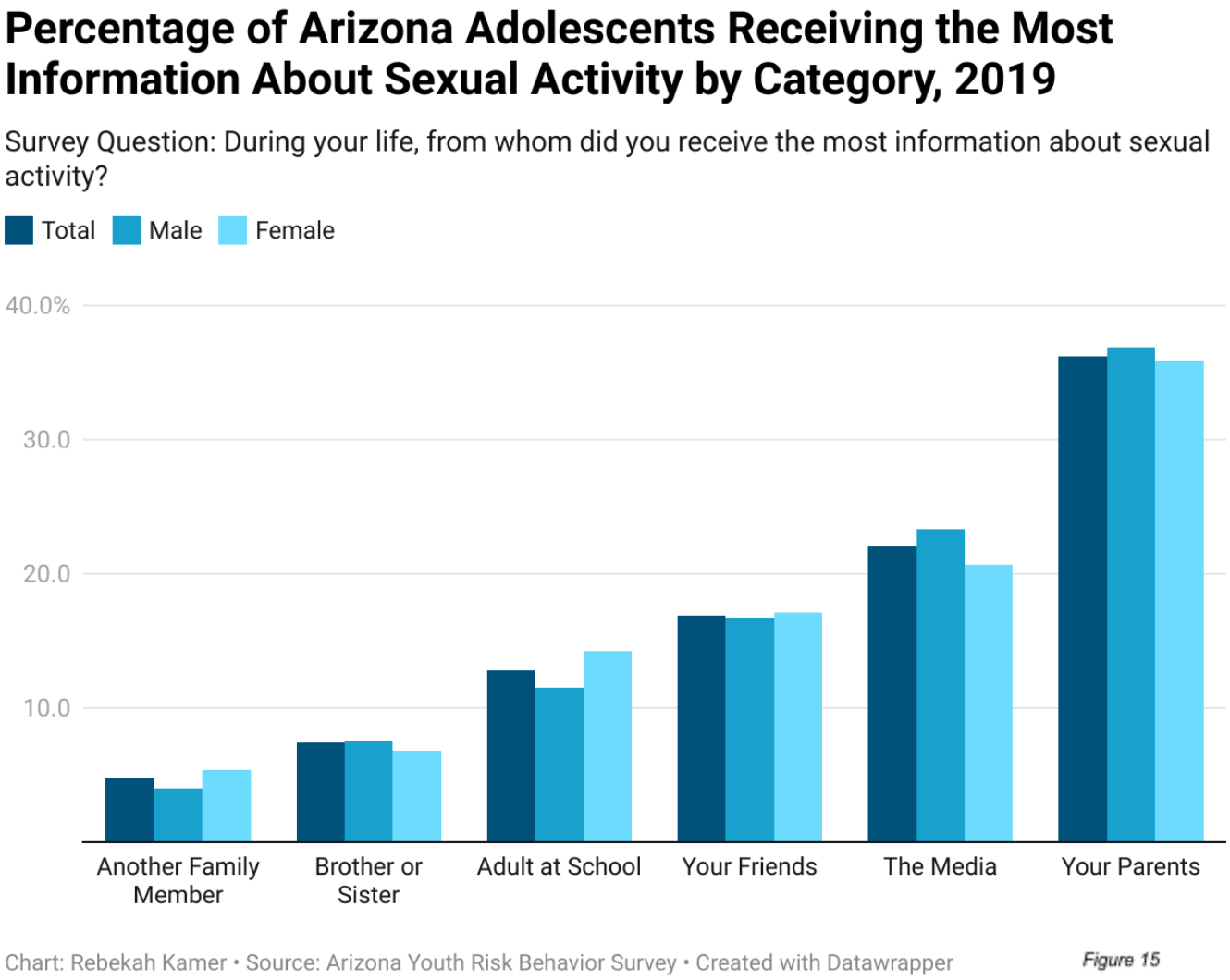

Figure 15

Though schools cannot and should not be primary methods of facilitating conversations about sensitive topics, knowledgeable and trained school professionals can provide valuable information to support adolescents and youth in making safer choices. In the graph above, we can see that the percentage of high school students in Arizona that received the most information about sexual activity from a knowledgeable adult at school is low, with the average being 12.8% across all grades, gender, and racial

[35] Szucs, L. E., Lowry, R., Fasula, A. M., Pampati, S., Copen, C. E., Hussaini, K. S., Kachur, R. E., Koumans, E. H., & Steiner, R. J. (2020). Condom and contraceptive use among sexually active high school students — youth risk behavior survey, United States, 2019. *MMWR Supplements*, *69*(1), 11–18. https://doi.org/10.15585/mmwr.su6901a2

and ethnic groups. Without ensuring that all high school students are receiving accurate, evidence-based information regarding sexual health and STI prevention, the rates of STIs will likely continue to rise. Alongside rising rates of STIs, there is also a rise in subsequent community burden. Sexually transmitted infections have tremendous health and economic burdens on the United States and Arizona is no exception.[36] Aside from the extensive common health implications that STIs have, STIs are estimated to cost the U.S. healthcare system $16 billion annually.[37]

Child and Adolescent Exposure to Pornography - **HE / CPSS / SEC / FE**

Child and adolescent exposure to pornography is occurring at all ages and increasing overtime. Pornography is defined as photos, films, books, or other material depicting erotic or sexual acts designed to cause sexual arousal. Most adolescents have access to the internet on personal devices, a family member's device, or their friends', which has contributed to the increased rate of exposure. A 2021 study, reported that 56% of American high school students were exposed in the "past year".[38] A separate study found 80.3% of older adolescents have accessed pornography.[39] The American Psychological Association conducted studies that found young boys' exposure to be as early as 5 years old. The effects of pornography on youth development is still not fully understood due to a lack of longitudinal research. Key highlights of what is known so far are as follows: [40,41,42]

- The majority of adolescents are viewing pornography on purpose or inadvertently with first exposure on average occurring between ages 11 and 12.
- Most pornography is accessed on mobile devices via free websites.
- For children without an understanding of healthy sexuality, exposure of any pornography can be traumatic, especially violent pornography.
- Adolescent pornography exposure has been linked to permissive attitudes regarding sex, aggressive sexual behaviors, self-objectification, body comparisons and dysmorphia, and the development of pornography influenced sexual scripts.

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[36] Eng, T. R., & Butler, W. T. (1997). *The hidden epidemic: Confronting sexually transmitted diseases*. National Academy Press.

[37] Owusu-Edusei K, et al. The estimated direct medical cost of selected sexually transmitted infections in the United States, 2008. Sex Transm Dis 2013; 40(3): pp. 197–201.

[38] Maheux, A. J., Roberts, S. R., Evans, R., Widman, L., & Choukas-Bradley, S. (2021). Associations between adolescents' pornography consumption and self-objectification, body comparison, and body shame. *Body Image*, *37*, 89–93. https://doi.org/10.1016/j.bodyim.2021.01.014

[39] Astle, S., Leonhardt, N., & Willoughby, B. (2019). Home base: Family of origin factors and the debut of vaginal sex, anal sex, oral sex, masturbation, and pornography use in a national sample of adolescents. *The Journal of Sex Research*, *57*(9), 1089–1099. https://doi.org/10.1080/00224499.2019.1691140

[40] Ashwell, K., & Restak, R. (2019). *The brain book: Development, function, disorder, health*. Firefly Books.

[41] Giordano, A. (2022, February 27). *What to know about adolescent pornography exposure*. Psychology Today. Retrieved April 1, 2022, from https://www.psychologytoday.com/us/blog/understanding-addiction/202202/what-know-about-adolescent-pornography-exposure

[42] Barrett, D. (2010). *Supernormal Stimuli: How primal urges overran their evolutionary purpose*. W.W. Norton.

- Studies ascribe several possible characteristics to the adolescent pornography user; identifying as male, pubertally more advanced, sensation-seeking, experiencing low family attachment and involvement, and low supervision.[43]

While the long term effects of this phenomenon are still unfolding, initial studies have indicated infliction of emotional trauma, increased instances of risky sexual behaviors, increased likelihood that adolescents will go on to be victims of sexual violence, and the increased likelihood that adolescents will go on to be perpetrators of sexual violence.[44] Though schools cannot and should not be primary facilitators of conversations about sensitive topics, there are opportunities for classrooms to mitigate the harmful effects that pornography exposure has on adolescents. Comprehensive sexual and reproductive health education promotes healthy relationship building and self-efficacy, which could result in reduction of negative effects of exposure to pornography.

Education Opportunities

Comprehensive sexual and reproductive health education does not focus solely on sexual activity; it promotes evidence-based, positive youth development aligned with national health standards. Age-appropriate information regarding adolescent sexual and reproductive health, building healthy relationships, career and adulthood skill building, empathy building and risk behavior prevention are all part of the standards for comprehensive health education and are recommended for instruction.[45] Age-appropriate, comprehensive health education can help reduce negative health outcomes. Community rates of teen pregnancy, STI's, teen dating violence, substance use, and interpersonal violence all have decreasing associations where evidence-based programming is implemented. These reductions have longitudinal effects on reducing rates of poverty, child abuse and neglect, crime, and other high impact community concerns. [46,47,48,49]

Many county health departments are active partners when it comes to the delivery of comprehensive sexual health. The National Association of County and City Health Officials (NACCHO) outlines collaborative support from local health departments in three capacities: health services, health education, and safe and supportive environments. A 2018 NACCHO report outlines the opportunities for public health to collaborate with school districts in clinical settings, through policy guidance, and in

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[43] Jochen, P., & Valkenburg, P. (2016, March 30). Adolescents and Pornography: A Review of 20 Years of Research. The Journal of Sex Research, 53:4-5, 509–531

[44] Jochen, P., & Valkenburg, P. (2016, March 30). Adolescents and Pornography: A Review of 20 Years of Research. The Journal of Sex Research, 53:4-5, 509–531

[45] Health education standards and resources. Arizona Department of Education. (2022, July 11). Retrieved July 19, 2022, from https://www.azed.gov/pe/health-education

[46]Inman, D. D., Bakergem, K. M., LaRosa, A. C., & Garr, D. R. (2011, February). Evidence-Based Health Promotion Programs for Schools and Communities. American Journal of Preventive Medicine.

[47] Eisen, M., Pallitto, C., Bradner, C., & Bolshun, N. (2000). Teen-Risk Taking: Promising Prevention Programs and Approaches. National Prevention Information Network. .

[48]Marx, E., Wooley, S. F., & Northrop, D. (1998). *Health is academic: A guide to coordinated school health programs*. Teachers College Press.

[49]Nation, M., Crusto, C., Wandersman, A., Kumpfer, K. L., Seybolt, D., Morrissey-Kane, E., & Davino, K. (2003). What works in prevention: Principles of effective prevention programs. *American Psychologist*, *58*(6-7), 449–456. https://doi.org/10.1037/0003-066x.58.6-7.449

programmatic work.[50] Nationwide, several barriers prevent this work from being implemented including limited and inflexible funding, staff capacity, and a lack of prioritization of adolescent health. In Arizona, policy can also serve as a barrier to accomplish work in sexual and reproductive health with schools. Exploring opportunities to engage stakeholders with data that educates school boards, parents, and administrators could result in better support for health education at the local level. In Arizona, Teen Pregnancy Prevention Program partners with county health departments, some of which then partner with community-based organizations to extend the reach of health education programming. Examination of these successful partnerships could help increase health education in counties experiencing staffing shortages.

[50] National Association of County and City Health Officials. (2018, November). The Role of Local Health Departments in Advancing Adolescent HIV and STI Prevention Efforts Through School-Based Programs.

Substance Use - **HE / HS / CPSS / PEnv / SEC / CI / FE**

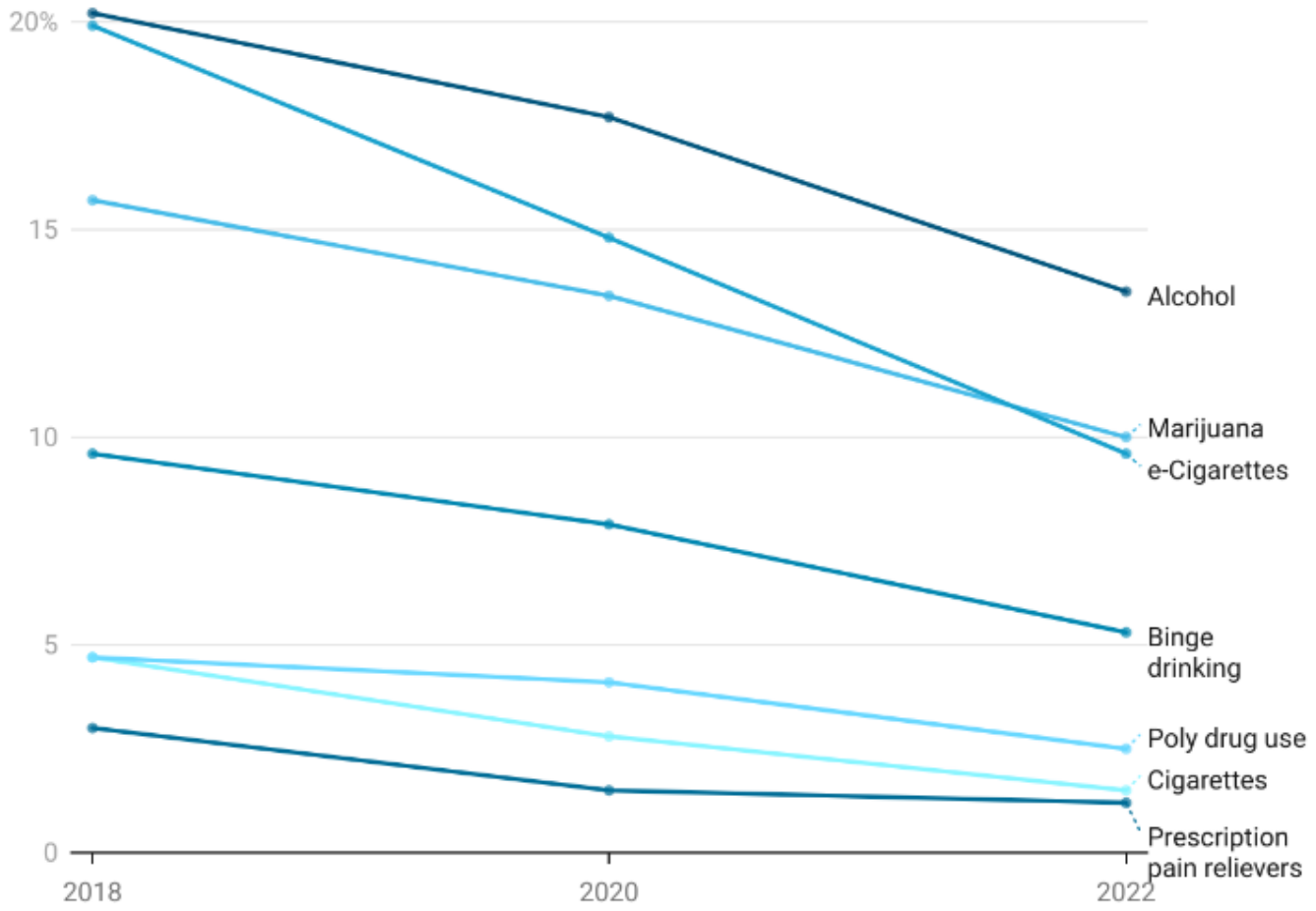
Substance use encompasses a wide variety of mind-altering substances with varying intensities, consequences, and level of risk. Substances can include alcohol, nicotine, tobacco, marijuana, prescription medication, opioids, stimulants, depressants, psychedelics, and more. While some substance use among youth may be regarded as trivial acts of rebellion and self-exploration, more often it is attributed as an indicator of mental health challenges and the likelihood of future risk-taking. Adverse Childhood Experiences (ACEs - see page 13) can increase the possibility of substance use, compounding with each additional ACE. Risk factors that contribute to a youth's likelihood of substance use can include: family history of substance abuse, poor parental monitoring, association with peers who use substances, low academic achievement, mental health challenges, family rejection of sexual orientation or gender identity, lack of school connectedness, and childhood sexual abuse, among others.[51]

Three of the most frequently used substances among adolescents are tobacco or nicotine-containing products, alcohol, and marijuana. Data from the Arizona Youth Survey (AYS) details self-reported substance use from 2014 to 2018 among 8th, 10th, and 12th graders. Although significant decreases in cigarette use are reported, increases in e-cigarette/vape use are significant enough to prioritize continued prevention programs that address shared risk factors. Alcohol and marijuana use over this time period appear to have minimal changes in prevalence. With the exception of vaping/tobacco prevention programming, information addressing the delivery of prevention curriculum focusing on substance use was not available for this report. Local health department staff are already experienced in providing tobacco use prevention programming. Many local education agencies may benefit from training and technical assistance from public health partners to expand substance use prevention programming.

[51] Centers for Disease Control and Prevention. (2020, October 22). *High risk substance use in youth*. Centers for Disease Control and Prevention. Retrieved April 1, 2022, from https://www.cdc.gov/healthyyouth/substance-use/index.htm

Percentage of Students Who Used Substances on One or More Ocassions During the Past 30 Days

Arizona Youth Survey



Binge Drinking- drunk 5 or more alcoholic beverages in a row. Poly Drug Use- used multiple drugs at the same time.

Chart: Rebekah Kamer • Source: Arizona Criminal Justice Commission • Created with Datawrapper

Figure 16

Nicotine and Tobacco - **HE / HS / CPSS / SEC / PEnv / EW / FE / CI**

Tobacco and Nicotine Trends (AzYRBS data):

- Students currently smoking cigarettes (at least once in a 30 day time period) has decreased from 10.1% in 2015 to 3.4% in 2021.
- The percentage of students who first tried a cigarette before the age of 13, has increased from 8.5% in 2015 to 8.6% in 2021.

- The rate at which students are smoking cigarettes regularly (20 or more days out of 30) has decreased from 2.3% in 2015 to 0.7% in 2021.
- Percentage of students who currently use electronic vaping products regularly (20 or more days out of 30) has increased from 3.1% in 2015 to 7.4% in 2021.

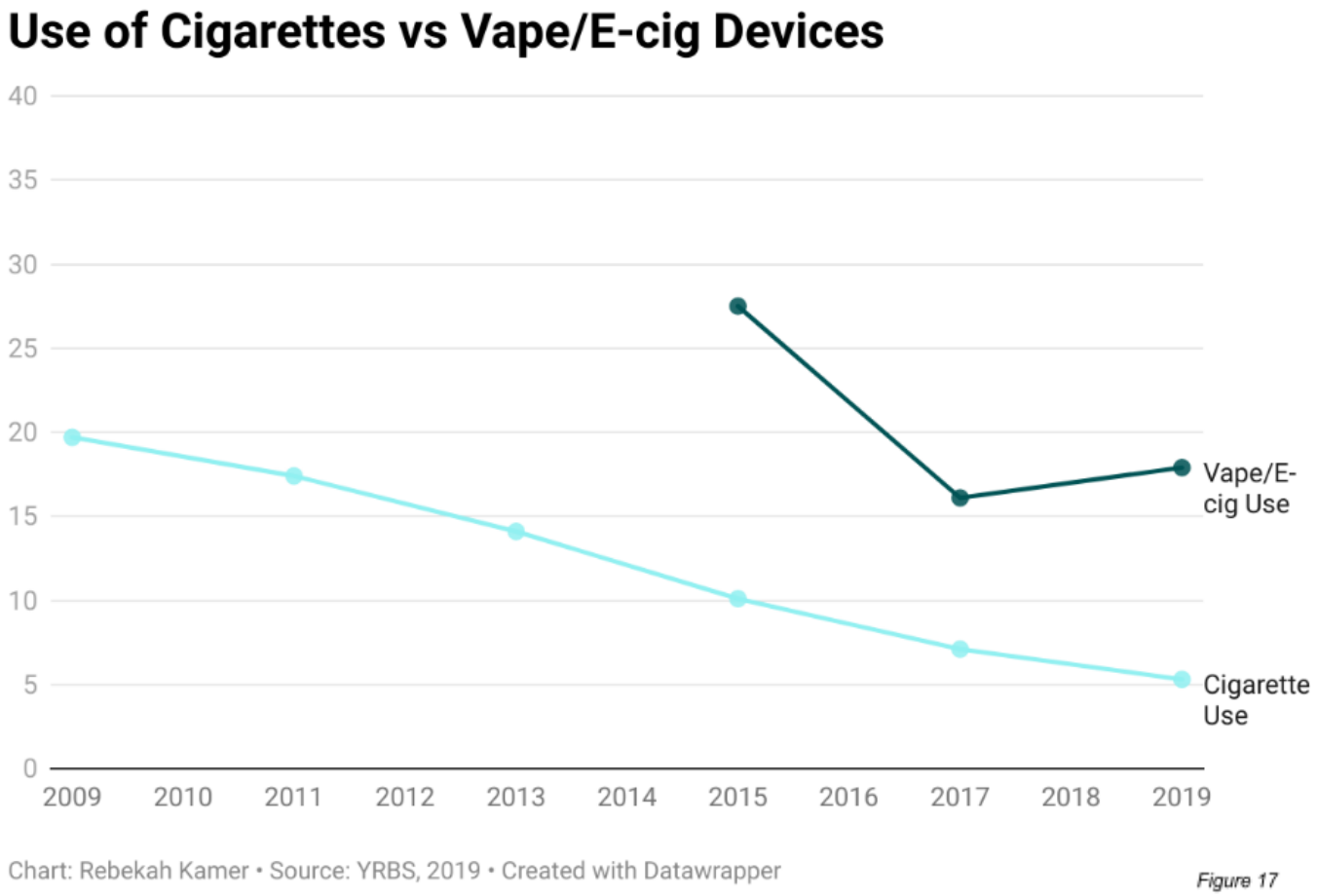


Figure 17

Poor academic achievement has not been causally linked to tobacco use, though *correlation* exists between tobacco use and poor academic performance. This correlation may be more likely connected to an increased prevalence of risk factors, but more research to establish a direct relationship is needed.[52] Furthermore, nicotine product use is occuring more often in the forms of e-cigarettes and vaping devices and less often in cigarettes and smokeless tobacco as seen in the YRBS data above.

Tobacco funding for prevention is in the millions and is the most stable type of local health department (LHD) integration within schools in the state. Nearly every county health department has a tobacco program that is integrated within schools. The funding for these programs allows for education on vaping as well as other nicotine products. The effective collaboration between public health and school systems

[52] Chai, L., Xue, J., & Han, Z. (2020). The effects of alcohol and tobacco use on academic performance among Chinese children and adolescents: Assessing the mediating effect of skipping class. *Children and Youth Services Review*, *119*. https://doi.org/10.1016/j.childyouth.2020.105646

built around tobacco prevention in multiple jurisdictions across Arizona is documented. In some cases, this is the only partnership between public health and public education. Even though these partnerships exist, information pertaining to the evaluation or benefit analysis of collaboration does not seem to exist.

A few important things to keep in mind about vaping nicotine:[53]

- The amount of nicotine consumed by vaping is often much higher than that of adolescent use of cigarettes with some vaping pods containing more nicotine than a pack of cigarettes.
- Vaping nicotine is more discreet as there is often a flavor associated with the vaping pod that masks the scent of nicotine, and vaping is not detected by smoke alarms allowing adolescents to hide their nicotine use more easily than with cigarettes.
- There are varying levels of nicotine concentration in vaping products and adolescents are not always aware of this and inadvertently become addicted to nicotine very quickly.

During 2019–2020, there was a nationwide outbreak of e-cigarette, or vaping, product use-associated lung injury (EVALI) that resulted in 68 deaths and 2,668 hospitalizations. National and state data from patient reports and product sample testing showed tetrahydrocannabinol (THC)-containing e-cigarette or vaping products, particularly from informal sources like friends, family, or in-person or online dealers, were linked to most cases and played a major role in the outbreak. Vitamin E acetate was strongly linked to the outbreak and evidence was not sufficient to rule out the contribution of other chemicals of concern, including chemicals in either THC or non-THC products. As self-reported use of these products increases in K–12 populations, public health must continue monitoring short and long term effects of product use.

Opioids - **HE / HS / CPSS / SEC / EW / FE / CI**

In 2017, Arizona declared a public health emergency to address the opioid crisis. This emergency declaration provided an influx of resources to the state to begin to address the ongoing emergency. Opioids are a class of drugs that include the illegal drug heroin, synthetic opioids such as fentanyl, and pain relievers available legally by prescription, such as oxycodone (OxyContin®), hydrocodone (Vicodin®), codeine, morphine, and many others.[54] Opioids are highly addictive and are frequently lethal when sufficient quantities are used. The public health response has consisted of monitoring overdoses, implementing multilevel interventions, and a range of policy strategies. The rates of misuse have begun to decline. Use of opioids have immediate mortality and morbidity consequences for users and an increased risk of blood-borne pathogens from intravenous opioid use.

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[53] US Surgeon General. (2022). *Know the risks of e-cigarettes for young people: Know the risks: E-cigarettes & young people: U.S. surgeon general's report*. Know the Risks: E-cigarettes and Young People. Retrieved April 1, 2022, from https://e-cigarettes.surgeongeneral.gov/knowtherisks.html

[54] U.S. Department of Health and Human Services. (2020, November 5). *Opioids – digital media kit*. National Institutes of Health. Retrieved March 16, 2022, from https://www.nih.gov/news-events/opioids-digital-press-kit#:~:text=Opioids%20are%20a%20class%20of,in%20treatment%20for%20relieving%20pain.

There are currently insufficient surveillance methods implemented in Arizona that pertain to adolescent opioid use. The self-reported surveillance methods being used such as the AYS and the YRBS are under-uitilized and do not provide sufficient information on youth opioid use.

A data visualization regarding non-fatal opioid overdose in school-aged children in Arizona between 2017 and 2021 are represented in the graph below. The data is from the Medical Electronic Disease Surveillance Intelligence System (MEDSIS) and shows a growing rate of non-fatal opioid poisonings from 2017–2020, with a decrease in poisonings in 2021. This decrease is not fully understood as the number of fatal drug poisonings in Arizona has increased from 30 fatal poisonings in 2019 to 66 in 2020 as reported by the Arizona Childhood Fatality Review Program (CFRP) annual reports. In 2020, the leading cause of childhood death for 15–17 year olds was poisoning as reported by the Arizona Childhood Fatality Review Team. Furthermore, from 2017–2021, male school-aged children are overrepresented in non-fatal opioid poisonings with a total average of 70.19%. Opioids, mainly synthetic opioids (other than methadone), are currently the largest driver of drug overdose deaths (82.3% of all drug overdose deaths). [55]

Average Percentage of Non-Fatal Opioid Overdoses Resulting in Hospitalization by Sex of 5-19 Y.O. in Arizona between 2017-2021

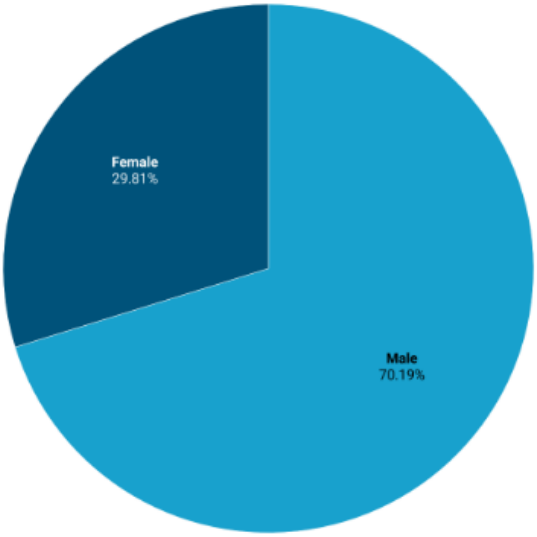

Chart: Rebekah Kamer • Source: Hospital Discharge Database • Created with Datawrapper

Figure 18

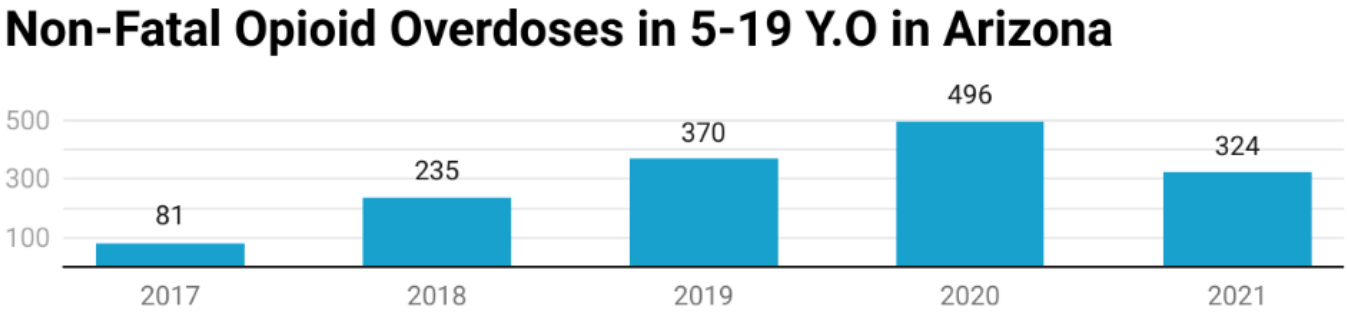

Chart: Rebekah Kamer • Source: Medical Electronic Disease Surveillance Intelligence System (MEDSIS) • Created with Datawrapper

Figure 19

[55] Gallaway MS, Tasnim L, Reamer M, Davidson S, and Erhart L. Annual Report on Opioid Overdoses in Arizona, 2020-2021. Phoenix, AZ. Arizona Department of Health Services; 2022.

Alcohol - **HE / HS / CPSS / SEC / EW / FE / CI**

Youth alcohol consumption is a pervasive and dangerous behavior with many societal and individual health consequences such as family, financial, and relationship strains. Community impacts include increases in motor vehicle crashes and related deaths, and the economic impacts of lower educational attainment. Below are the key takeaways from adolescent alcohol use.[56]

Youth are more likely to use alcohol when:

- Their peers or family members use alcohol.
- There is easy access to alcohol within their community.
- They are exposed to popular media that depicts and/or glamorizes alcohol use.
- They experience untreated mental illness(es).

(*It's important to note that genetics play a role in Alcohol Use Disorder, whereas heritable traits comprise approximately 60 percent. NIH notes, "AUD risk is influenced by the interplay between a person's genes and their environment. Parents' drinking patterns may also influence the likelihood that a child will one day develop AUD."*) [57] [58]

Youth who drink alcohol are more likely to:

- Experience issues in school such as higher rates of absences and earning lower grades.
- Experience physical problems include engaging in fights, getting into accidents while under the influence such as vehicle crashes, burns, falls, and drowning, hangovers, alcohol poisoning, and other illnesses.
- Experience disruption of normal growth, sexual development, and/or permanent cognitive impairments.
- Be at increased risk of suicide or homicide.
- Engage in unwanted, unplanned, or unprotected sexual activity as well as sexual violence.
- Use other substances.

Alcohol and the Built Environment [59]

Neighborhood and built environments, one of the social determinants of health (refer to page 9 and Appendix III Glossary), have a direct impact on human health. Communities with dense alcohol related retailers are more often areas that experience higher levels of poverty. When alcohol is more easily accessible, it is consumed at higher frequencies and greater volumes. The prevalence of dense alcohol retailers impacts both people of legal drinking age and underage adolescents. Community Based Participatory Research (CBPR) empowers communities to research pervasive problems such as this one

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[56] Baughman, K. (2018, May). *Teens and alcohol*. Teens and Alcohol | CS Mott Children's Hospital | Michigan Medicine. Retrieved April 1, 2022, from https://www.mottchildren.org/posts/your-child/teens-alcohol

[57] Edenberg HJ. The genetics of alcohol metabolism: role of alcohol dehydrogenase and aldehyde dehydrogenase variants. Alcohol Res Health. 2007;30(1):5–13. PMID: 17718394; PMCID: PMC3860432.

[58] U.S. Department of Health and Human Services. (2021, April). *Understanding alcohol use disorder*. National Institute on Alcohol Abuse and Alcoholism. Retrieved December 30, 2022, from https://www.niaaa.nih.gov/publications/brochures-and-fact-sheets/understanding-alcohol-use-disorder

[59] Agency for Toxic Substances and Disease Registry. (2015, June 25). *Chapter 1: Models and frameworks*. Centers for Disease Control and Prevention. Retrieved April 1, 2022, from https://www.atsdr.cdc.gov/communityengagement/pce_models.html

and allows for grassroots policy development to lower alcohol retail density. Thus, neighborhood policy change impacting the built environment can result in better health outcomes and strengthen partnerships with community-based stakeholders.[60]

Alcohol Use in Teens (YRBS, 2019) (AYS, 2022)

Alcohol use among adolescents is trending downwards in multiple ways. However, these trends are not occurring equally across all demographics. In 2019, male students (20.4%) were more likely to drink at a younger age compared to their female counterparts (13.7%). However, for the same year, female students were more likely to have had at least one drink of alcohol, on at least 1 day during the 30 days before the survey (29.5%) than male students (23.5%). The 2019 YRBS report also shows youth alcohol consumption occurs at a younger age in Hispanic/Latino students (21.1%) compared to their White counterparts (12.7%). Moreover, White adolescents tend to consume more alcohol at a given time and drink more frequently than Hispanic/Latino students do.

- Rate of students driving after consuming alcohol has decreased from 9% in 2013 to 2.5% in 2021.
- Number of students who have their first sip of alcohol before 13 years of age (other than a few sips) has decreased from 25.6% in 2009 to 17% in 2019.
- Rate of students who drank alcohol at least once in a 30-day time period has decreased from 44.5% in 2009 to 22.4% in 2021.
- Prevalence of students binge drinking (drinking 4 or more drinks for females and 5 or more drinks for males in a couple of hours at least once in a 30 day period) has only dropped from 17.9% in 2017 to 11.3% in 2021.
- Most commonly reported ways of obtaining alcohol in 2022 was at a party (44.3%), from a relative who is 21 or older (33%), or from a parent/guardian (28%).

Supporting local health departments with Youth Participatory Action Research (YPAR) to address alcohol use in disproportionately affected communities has significant implications for cross-cutting risk reduction.[61] Participatory Action Research (PAR) empowers community members to learn and apply research techniques in order to discover solutions to issues in their community. Youth Participatory Action Research (YPAR) is when youth and adults partner to improve the conditions of youth lives and communities using these research techniques. The information that comes out of the YPAR process is meant to be used to advocate for change in communities.[62] Significant YPAR work in many communities has resulted in awareness, education, and sustainable solutions to address root problems identified by youth leading YPAR projects.

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[60]Centers for Disease Control and Prevention. Guide for Measuring Alcohol Outlet Density. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2017

[61] University of California Berkeley. (2015). *New Virtual Learning Curriculum!* YPAR Hub. Retrieved April 15, 2022, from http://yparhub.berkeley.edu/

[62] *What is Youth Participatory Action Research? A where-to-start guide for youth, educators, and youth workers around the world*. (2018, May). Retrieved December 29, 2022, from https://www.youthactivismproject.org/wp-content/uploads/2018/05/Youth-Activism-Project-YPAR-Guide.pdf

Marijuana - **HE / HS / CPSS / SEC / EW / FE / CI**

Teen years are a time of development and exploration for adolescents in which risk-taking can foster identity development and independence. Beneficial risk-taking can include trying out for a sport or asking someone out on a date. However, harmful risk-taking, such as using marijuana, can have unfavorable consequences on an adolescent's health and well-being. The recent legalization of recreational marijuana is expected to cause an increase in illegal adolescent use of marijuana as it becomes more widely available. Currently, adolescent marijuana use is not well monitored. Key points of information are missing or incomplete such as: the effects of marijuana use on adolescent health, and the effects of marijuana use on educational attainment. Though AYS gives a basic understanding of where youth are obtaining marijuana (57% are obtaining from friends), more qualitative information about where friends are acquiring could help frame prevention efforts.

The Arizona YRBS reports the following statistics:

- The rate of adolescents using marijuana (at least once in a 30 day period) has increased from 23.7% in 2009 to 26.1% in 2019 with consistency across all race and gender demographic categories; a decrease in total use to 19.6% in 2021 was reported.
- Regular youth marijuana use in Arizona at 26.1% is occuring at a rate 4% higher than the national average which is reported at 21.7%.
- 8.2% of Arizona youth tried marijuana before 13 years of age, compared to 5.6% nationally.

The Teen Brain on Marijuana [63]

Marijuana use during adolescence has shown to be harmful. Marijuana use in young adults and adolescents may harm the developing brain in a myriad of ways including:

- Cognitive effects such as difficulty thinking, trouble with memory, learning, and problem solving.
- Reduction in physical coordination.
- Shortening of attention span.
- Difficulties in school and social life.

Prevention Opportunities

Many federal agencies have resources and publications regarding youth substance use prevention such as the Drug Enforcement Agency (DEA), National Institute on Drug Abuse (NIDA), and the Substance Abuse and Mental Health Services Administration (SAMHSA). Some of the interventions these agencies recommend for youth substance use prevention include schools and/or communities organizing substance abuse prevention fairs to raise awareness on the impact of drug abuse, participating in the DEA's Red Ribbon Week, participating in SAMHSA's National Prevention Week, and more.[64] Many LHDs work alongside LEAs and their communities to coordinate youth substance use prevention programs that align with federal recommendations. There are also opportunities to coordinate with local law

[63] Abraham, A., Zhang, A. J., Ahn, R., Woodbridge, A., Korenstein, D., & Keyhani, S. (2018). Media Content Analysis of marijuana's health effects in news coverage. *Journal of General Internal Medicine*, *33*(9), 1438–1440. https://doi.org/10.1007/s11606-018-4492-9

[64] US Department of Justice Drug Enforcement Administration. (2018). Preventing Marijuana Use Among Youth & Young Adults.

enforcement such as through the Crime Prevention Through Environmental Design (CPTED), violence prevention offices, and a variety of intergovernmental agreements to coordinate data sharing between agencies. Currently, Arizona law enforcement and public health organizations partner with many other agencies via the child-fatality review program. This multi-sector partnership has resulted in strong data-driven interventions which have resulted in significantly reduced child fatalities.[65] Community, school, peer, and family connectedness addresses substance-use prevention across the Social-Ecological Model (see figure 8, page 9) and intersecting protective factors.

[65] Rimsza, M. E., Schackner, R. A., Bowen, K. A., & Marshall, W. (2002). Can child deaths be prevented? The Arizona Child Fatality Review Program experience. *Pediatrics*, *110*(1). https://doi.org/10.1542/peds.110.1.e11

Mental and Behavioral Health - **HE / PEPA / HS / CPSS / SEC / EW / FE / CI**

One of the positive impacts of the COVID-19 pandemic was highlighting the existing need for mental and behavioral health services for youth. Anecdotal evidence from school staff, behavioral health providers, and healthcare workers indicate a dramatic increase in depression, anxiety, and suicidal ideation among K–12 youth nationally and in Arizona. Current data are difficult to find, but national trends cite extended periods of social isolation, social instability, and increasing societal polarization as contributing factors to the increased demand for mental health service provision. According to the CDC, mental health challenges are a growing problem for adolescents, where over 1 in 3 high school students experienced persistent feelings of sadness or hopelessness in 2019, a 40% increase since 2009. Furthermore, there has been a 44% increase in youth making a suicide plan from 2009 to 2019. Arizona saw 49 child deaths in 2020 due to suicide, an increase of 30% from 2019. The risk for suicide and feelings of depression have been found to be more common amongst individuals who identify as LGBTQIA2S+.[66]

Trends in Suicide Attempts and Suicidal Ideation (HDD)

Analysis of data from Arizona's Hospital Discharge Database found the following information:

- The number of adolescents (5 to 19 years old) seen in the hospital for a non-fatal suicide attempt has increased from 2,861 adolescents in 2017 to 4,180 in 2021. This is a 46% increase in 5 years time.
- The effect that COVID had on 2020-2021 3,319 to 4,180
- Female adolescents are almost twice as likely as their male counterparts to be seen in the hospital for both suicidal ideation and injuries due to suicide attempts.

[66] Centers for Disease Control and Prevention. (2022, March 31). *Adolescent Behaviors and Experiences Survey (ABES)*. Centers for Disease Control and Prevention. Retrieved April 1, 2022, from https://www.cdc.gov/healthyyouth/data/abes.htm

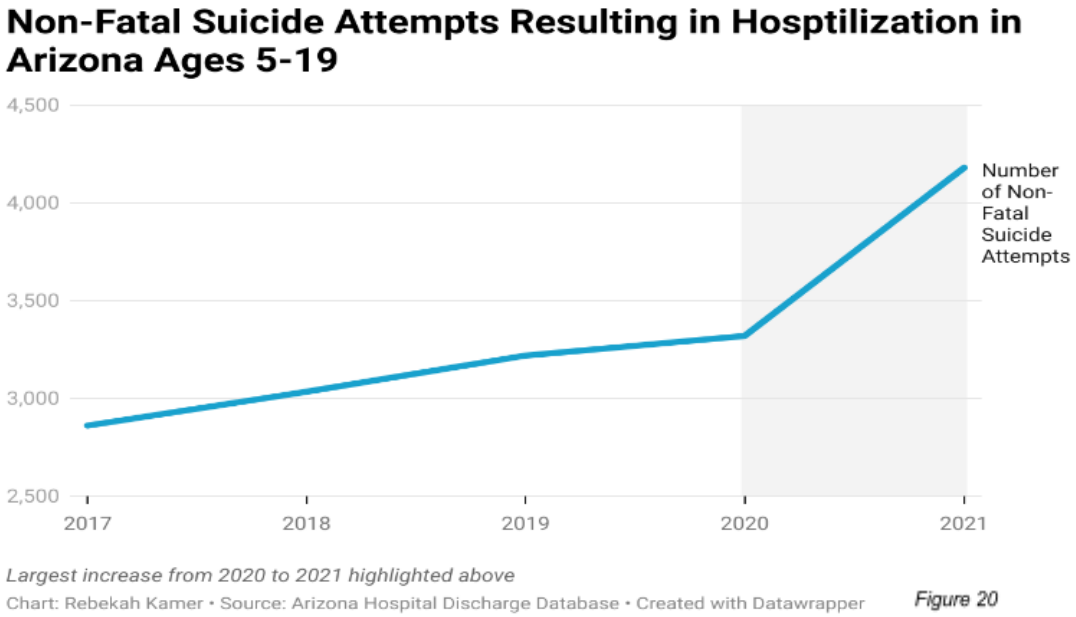

Figure 20

Trends in Mental Health of LGBTQIA2S+ Youth [67]

- During 2015–2019, LGB youth in the US were more than 4.5 times as likely to attempt suicide than their peers. [68]
- There is an LGTBQIA2S+ youth suicide attempt every 45 seconds in the United States. [69]
- Transgender and Nonbinary youth are 2 to 2.5 times as likely to experience depressive symptoms, seriously consider suicide, and attempt suicide than their cisgender LGBQ peers. [70]

- LGBTQIA2S+ youth of color reported higher rates of attempting suicide compared to their White peers. Of the roughly 35,000 LGBTQIA2S+ youth surveyed who reported a suicide attempt: [71]
    - 12% were White, non-Hispanic
    - 12% were Asian or Pacific Islander, non-Hispanic
    - 18% were Hispanic/Latino
    - 21% were Black, non-Hispanic
    - 21% were Multiracial, non-Hispanic
    - 31% were American Indian/Alaska Native, non-Hispanic

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[67] The Trevor Project. (2022, January 21). *Facts about LGBTQ youth suicide*. The Trevor Project. Retrieved April 14, 2022, from https://www.thetrevorproject.org/resources/article/facts-about-lgbtq-youth-suicide/
[68] Johns, M. M., Lowry, R., Haderxhanaj, L. T., et al. (2020). Trends in Violence Victimization and Suicide Risk by Sexual Identity Among High School Students — Youth Risk Behavior Survey, United States, 2015–2019. *Morbidity and Mortality Weekly Report*, *69,*(Suppl-1):19–27.
[69] Green, A. E., Price-Feeney, M., & Dorison, S.H. (2019). *National Estimate of LGBTQ Youth Seriously Considering Suicide*. New York, New York: The Trevor Project.
[70] Price-Feeney, M., Green, A. E., & Dorison, S. (2020). Understanding the mental health of transgender and nonbina/sry youth. *Journal of Adolescent Health, 66*(6), 684–690.
[71] The Trevor Project. (2021). *2021 National Survey on LGBTQ Youth Mental Health.* West Hollywood, California: The Trevor Project.

- A 2020 peer-reviewed study by The Trevor Project's researchers, published in the American Journal of Public Health, identified that LGBTQIA2S+ youth who undergo conversion therapy were more than twice as likely to attempt suicide once in a year and 2.5 times as likely to attempt suicide multiple times in a year.[72]

Tiered prevention includes focused interventions addressing students for whom the data show are disproportionately affected by suicidality. The Trevor Project is a non-profit organization founded in 1998 focused on suicide prevention for LGBTQIA2S+ youth. They operate a 24-hour suicide hotline every day of the year. In addition to crisis services, The Trevor Project conducts research, advocacy, public education, and maintains an international community called TrevorSpace. The Trevor Project provides resources and information on how to best support LGBTQIA2S+ youth in a myriad of ways including school based settings. To address these inequities, ADHS released the 2022–23 Suicide Prevention Action Plan on June 15th, 2022. Of the six selected populations of focus, four have direct, or possible overlap with school age populations. These include LGBTQIA2S+, American Indians/Alaska Natives, adolescents (<18), suicide attempt survivors/survivors of suicide loss.

Poor mental health has been linked with all other content areas in this report as well as with increased risk of violence, decreased academic performance, and increased disciplinary referral. There currently is no data on how many K–12 students seek counseling services through their school in Arizona. Data collection for service provision from the LEA is scattered with no consistent process, and staffing shortages are prominent across the nation. The National Association of School Psychologists (NASP) conducted research and found the following:

- The ratio of students per school psychologist was estimated to be 1,211 to 1 in the United States in the 2019–2020 school year based on data collected by the National Center for Education Statistics.
- Surveys conducted by NASP corroborated this estimate. The ratio of students per school psychologist was estimated to be 1,233 to 1 during the 2019–2020 school year according to the NASP Membership Survey (Goforth et al., 2021).[73]

Eating Disorders and Disordered Eating

Eating Disorders

Eating Disorders (EDs) are serious mental and physical health conditions that are treatable with proper interventions and best when detected early. Data about EDs in the adolescent population of Arizona are limited and increased monitoring is needed. Many myths and misnomers about EDs and who suffers from them are prevalent and make the battle against EDs difficult. EDs affect individuals of all ages, genders, ethnicities, body shapes, and body weight. The most common types of eating disorders include

[72] Green, A. E., Price-Feeney, M., Dorison, S. H., & Pick, C. J. (2020). Self-reported conversion efforts and suicidality among U.S. LGBTQ youths and young adults, 2018. *American Journal of Public Health, 110*(8), 1221–1227.

[73]National Association of School Psychologists. (2021). Shortages in school psychology: Challenges to meeting the growing needs of U.S. students and schools
[Research summary].

anorexia nervosa, bulimia, binge eating disorders (BED), orthorexia, avoidant resistant food intake disorder (ARFID), and diabulimia. Common risk factors exist that make a person more susceptible to developing an ED. While the direct causes of ED are unknown, the risk factors for them include:[74]

- **Biological factors**
  - Having a close relative with an eating disorder or another mental health condition.
  - History of dieting – dieting and other weight control methods are associated with developing BEDs.
  - Negative energy balance – burning more calories than are ingested.
  - Type 1 diabetes – 25% of women diagnosed with type 1 diabetes will develop an eating disorder, most commonly diabulimia.
- **Psychological Factors**
  - Perfectionism – having unrealistically high expectations, especially self-oriented expectations.
  - Body image dissatisfaction – dissatisfaction in how one feels in and about their body.
  - Personal history of an anxiety disorder – experiencing an anxiety disorder such as generalized anxiety, social phobia, obsessive-compulsive disorder, etc.
  - Behavioral inflexibility – strictly adhering to rules and beliefs that there is a 'right' way to do things, especially in childhood.
- **Social Factors**
  - Weight stigma – societal messages that 'thinner is better' is pervasive in Western culture. Research has shown that this messaging increases body dissatisfaction that can lead to EDs.
  - Teasing or bullying – being the victim of bullying or teasing, especially regarding body weight.
  - Appearance ideal internalization – adhering to messages about the socially-defined 'ideal' body type.
  - Acculturation – people from ethnic minority groups experiencing rapid culture changes, such as Westernization.
  - Limited social networks – loneliness and isolation from others.
  - Historical trauma – or intergenerational trauma, ex: Jewish Holocaust survivors, Native American populations, enslaved Black Americans, etc.

Provided in this assessment is a very brief overview of EDs. EDs are complex, multidimensional, and require further investigation than what can be provided here. Further information and data about EDs can be found on the National Eating Disorder Association website.

Disordered Eating[75]

Disordered eating is a term used to describe various irregular eating behaviors, whether or not an individual meets the specific criteria of an eating disorder diagnosis. Disordered eating can disrupt a

[74] NEDA. (2022, March 10). *Statistics & Research on Eating Disorders*. National Eating Disorders Association. Retrieved June 9, 2022, from https://www.nationaleatingdisorders.org/statistics-research-eating-disorders

[75] Academy of Nutrition and Dietetics. (2020). *What is disordered eating?* Academy of Nutrition and Dietetics. Retrieved December 20, 2022, from https://www.eatright.org/health/health-conditions/eating-disorders/what-is-disordered-eating

person's quality of life and health and may develop into an eating disorder. Common disordered eating behaviors include:

- Frequent dieting, anxiety associated with certain foods, skipping meals;
- Chronic weight fluctuation;
- Rigid routines surrounding food and exercise;
- Feelings of guilt and shame associated with eating;
- Preoccupation with food, weight, and body image;
- Experiencing a loss of control around food, compulsive eating habits;
- Using exercise, calorie restriction, fasting, or other means of purging to "make up for bad foods" consumed.

These behaviors can cause a wide range of both mental and physical harm including:

- Greater risk of obesity and eating disorders;
- Bone loss (osteopenia and osteoporosis);
- Gastrointestinal disruptions;
- Electrolyte and fluid imbalances;
- Disturbances to heart rate and blood pressure;
- Increased anxiety, depression, and social isolation;
- General significant emotional, physical, and mental stress.

Arizona Specific Data

Weight Management and Diet Behaviors in Adolescents in Arizona 2011-2021

	Percentage of students who described themselves as slightly or very overweight			Percentage of students who were overweight (>= 85th percentile but <95th percentile for body mass			Percentage of students who had obesity (>= 95th percentile for body mass index, based on sex			Percentage of students who were trying to lose weight		
Year	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male
2011	29.4	33.8	25.3	13.9	12.6	15.1	10.9	6.9	14.6	46.6	62.1	31.5
2013	26.6	31.2	21.9	12.7	12	13.4	10.7	7.1	14.1	46.5	62.3	31.1
2015	30.4	35	26.1	14.7	14.2	15.1	10.9	7	14.5	48.5	61.1	36.4
2017	31.9	39.6	24.3	15.9	16.7	15	12.3	7.7	16.7	47.1	60.6	33.7
2019	33.3	37.9	28.7	17.4	19	15.8	13.3	8.9	17.6	49	59.3	38.8
2021	33.7	38.5	28.9	16.6	17.4	15.8	14.9	11.7	17.7	45.9	57.2	35

Table: Rebekah Kamer • Source: Arizona Youth Risk Behavior Survey • Created with Datawrapper

Figure 21

Eating Disorder and Disordered Eating Trends of Importance

(*All trends are National unless otherwise stated*)

- Having a negative body image can put individuals at a higher risk for eating disorders and other mental health conditions.[76]
- 34.1% of adolescents in the U.S. experience weight teasing, which is associated with an increase in disordered eating behaviors.[77]
- 29% of Arizona high school students (14% of males; 44% of females) have engaged in unhealthy weight control practices that include going without eating for 24 hours or more; taking any diet pills, powders, or liquids; vomiting or taking laxatives; smoking cigarettes; or skipping meals to lose weight or keep from gaining weight.[78]
- Adolescents 15–24 years of age with anorexia nervosa are 10 times more likely to die compared to their counterparts without the illness.[79,80]
- 25% of people with anorexia nervosa are males, and they are at a higher risk of dying than their female counterparts with anorexia nervosa partly because they are more likely to be diagnosed further into the development of the disorder since many assume that men do not suffer from EDs.[81]
- ED symptoms of all types are developing in both males and females at increasingly younger ages than previously seen.[82]
- 30% of individuals seeking weight-loss treatments display symptoms of BED.[83]
- As many as 3.5% of women and 2% of men will develop a BED.[78]

Eating Disorder and Disordered Eating Prevention

Public health efforts to prevent eating disorders and disordered eating address a child's relationship with food, movement, and body image. A healthy relationship with food and movement improves dietary behaviors, health, and wellbeing. Messages that do not label bodies or foods as good or bad can help lower the risk of body dissatisfaction, restrictive eating, chronic dieting, and disordered eating. Schools are positioned to address known risk factors that may appear in various areas of the school landscape and include protective factors such as:

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[76] Office on Women's Health. (2021). *Body image*. Body image | Office on Women's Health. Retrieved December 22, 2022, from https://www.womenshealth.gov/mental-health/body-image-and-mental-health/body-image

[77] Hooper, L., Puhl, R., Eisenberg, M. E., Crow, S., & Neumark‐Sztainer, D. (2021). Weight teasing experienced during adolescence and young adulthood: Cross‐sectional and longitudinal associations with disordered eating behaviors in an ethnically/racially and socioeconomically diverse sample. *International Journal of Eating Disorders*, *54*(8), 1449–1462. https://doi.org/10.1002/eat.23534

[78] Arizona Department of Health Services. (2022). Arizona 2021 Youth Risk Behavior Survey Results. Phoenix; Arizona. https://www.azdhs.gov/yrbs/index.php#survey-results

[79] *Smink, F. E., van Hoeken, D., & Hoek, H. W. (2012). Epidemiology of eating disorders: Incidence, prevalence and mortality rates. Current Psychiatry Reports, 14(4), 406–414*

[80] *Fichter, M. M., & Quadflieg, N. (2016). Mortality in eating disorders – Results of a large prospective clinical longitudinal study. International Journal of Eating Disorders, Epub ahead of print.*

[81] *Mond, J.M., Mitchison, D., & Hay, P. (2014) "Prevalence and implications of eating disordered behavior in men" in Cohn, L., Lemberg, R. (2014) Current Findings on Males with Eating Disorders. Philadelphia, PA: Routledge.*

[82] *van Son GE, van Hoeken D, Bartelds AI, van Furth EF, and Hoek HW. (2012). Time trends in the incidence of eating disorders: a primary care study in the Netherlands. International Journal of Eating Disorders, 39(7):565-9. doi: 10.1002/eat.20316*

[83] *Westerberg, D. P., & Waitz, M. (2013). Binge-eating disorder. Osteopathic Family Physician, 5(6), 230–233.*

- Selecting developmentally appropriate nutrition education for children and teens.[84]
- Review effective messaging strategies to evaluate current materials and resources that address health, nutrition, weight, and physical activity.[85]
- Encourage youth to foster a positive relationship with their body image, food, and exercise using curriculums such as the Body Positive.[86]
- Consider dissonance-based eating disorder prevention programs, such as the Body Project, that encourage adolescents to challenge media and social media appearance ideals and think critically about its effects on body image.[87]

[84] Satter, E. (2022). Evaluation Rubric from the Perspective of ecSatter and fdSatter Nutrition Education Programs and Materials. Ellyn Satter Institute.
[85] Lorts, C. (2021). The Language of Health: An Editorial Style Guide to Effectively Communicate to the Public. Phoenix; Arizona Department of Health Services.
[86] The Body Positive Organization. (2022, September 6). *Educators & Student Leaders*. The Body Positive. Retrieved December 22, 2022, from https://thebodypositive.org/educators-student-leaders/
[87] National Eating Disorders Association. (2018, February 22). *Prevention*. National Eating Disorders Association. Retrieved December 22, 2022, from https://www.nationaleatingdisorders.org/learn/general-information/prevention

Bullying and Violence - **HE / CPSS / SEC / FE / CI**

Bullying prevention has seen noteworthy resource allocation from ADHS. Prioritization of this work is demonstrated through headlining website content like “Must Stop Bullying” and agency participation in the Bullying Prevention Task Force that engages with multiple counties.

Of youth surveyed through the 2018 Arizona Youth Survey (AYS):

- 19% reported having harassed or made fun of another person online or through text in the last 12 months.
- 26.6% reported being picked on or bullied on school property in the last 12 months.
- 39.6% reported seeing someone being bullied on school property in the last 12 months.
- 21.4% reported not feeling safe at school in the past 12 months.

Other notable statistics include that:

- 48.9% of youth reported seeing someone punched, kicked, choked, or beaten up in the past 12 months.
- 9.2% of youth reported having been punched, kicked, choked, or beaten up in the past 12 months.

Information from AYS and YRBS is critical to help identify larger trends in population health outcomes, but the information from these tools doesn’t cover everything. For example, Exceptional Student Services housed in the Arizona Department of Education (ADE) has a Discipline Data Collection initiative that tracks special education disciplinary referrals. These data directly connect more specified outcomes for CYSHCN, and have not been fully explored with a public health lens. Including this dataset in a data sharing agreement with ADE would allow ADHS to assist with conducting analysis and evaluation from a public health perspective. Over time, this dataset could provide insight into school safety and trends associated with bullying and violence in schools.

Disproportionately Affected Populations

Certain populations experience higher rates of bullying than their peers. Children and Youth with Special Health Care Needs (CYSHCN) are more likely to experience unwanted, aggressive behavior that involves a real or perceived power imbalance,[88] and although there have been limited studies, CYSHCN are two to three times more likely to be bullied than their peers.[89] Nationwide, youth who identify as LGB report having been bullied on school property (32%) and cyberbullied (26.6%) in the past year which is more than their straight peers (17.1% and 14.1%, respectively).[90] The YRBS has recently started including LGB specific data in the survey to help monitor violence and bullying as experienced by individuals who identify as such which will allow for better data collection and analysis. A key limitation of the data is that the overall participation rate of 45% by Arizona schools in the 2021 YRBS survey

[88] Assistant Secretary for Public Affairs (ASPA). (2021, November 5). *What is bullying*. StopBullying.gov. Retrieved June 22, 2022, from https://www.stopbullying.gov/bullying/what-is-bullying
[89] Marshall, C. A. (2009). *Disabilities: Insights from across fields and around the world*. Praeger.
[90] Assistant Secretary for Public Affairs (ASPA). (2021, September 10). *LGBTQI+ youth*. StopBullying.gov. Retrieved June 22, 2022, from https://www.stopbullying.gov/bullying/lgbtq

prohibited the validation of the results. Identification of the barriers contributing to poor survey participation suggest COVID-related staff shortages and recent legislation like HB2162 (now ARS 15-117), which prohibits survey administration without express parental consent were contributing factors. Population monitoring tools like YRBS are critical for measuring health outcomes, and significant gaps occur when data are unavailable.

Screen Time and Internet Safety - **HE / SEC / EW / FE / CI**

The American Academy of Pediatrics (AAP) recognizes screen time and internet safety as emerging issues for students nationwide. In 2016, AAP released a policy statement about media use in school-age children and adolescents. This statement outlines recommendations for three subgroups; pediatricians, families, and researchers, governmental organizations and industry.[91]

Pediatricians	**Families**	**Researchers, Governmental Organizations, and Industry**
• Work with families and schools to promote understanding of the benefits and risks of media. • Promote adherence to guidelines for adequate physical activity and sleep via a Family Media Use Plan (www.HealthyChildren.org/MediaUsePlan). • Advocate for and promote information and training in media literacy. • Be aware of tools to screen for sexting, cyberbullying, problematic Internet use, and Internet gaming disorder.	• Develop, consistently follow, and routinely revisit a Family Media Use plan (see the plan from the American Academy of Pediatrics at www.HealthyChildren.org/MediaUsePlan). • Address what type of and how much media are used and what media behaviors are appropriate for each child or teenager, and for parents. Place consistent limits on hours per day of media use as well as types of media used. • Promote that children and adolescents get the recommended amount of daily physical activity (1 hour) and adequate sleep (8–12 hours, depending on age). • Recommend that children not sleep with devices in their bedrooms, including TVs, computers, and smartphones. Avoid exposure to devices or screens for 1 hour before bedtime. • Discourage entertainment media while doing homework. • Designate media-free times together (eg, family dinner) and media-free locations	• Continue research into the risks and benefits of media. • Prioritize longitudinal and robust study designs, including new methodologies for understanding media exposure and use. • Prioritize interventions including reducing harmful media use and preventing and addressing harmful media experiences. • Inform educators and legislators about research findings so they can develop updated guidelines for safe and productive media use.

[91] COUNCIL ON COMMUNICATIONS AND MEDIA, David Hill, Nusheen Ameenuddin, Yolanda (Linda) Reid Chassiakos, Corinn Cross, Jenny Radesky, Jeffrey Hutchinson, Alanna Levine, Rhea Boyd, Robert Mendelson, Megan Moreno, Wendy Sue Swanson, MBE; Media Use in School-Aged Children and Adolescents. Pediatrics November 2016; 138 (5): e20162592. 10.1542/peds.2016-2592

	(eg, bedrooms) in homes. Promote activities that are likely to facilitate development and health, including positive parenting activities, such as reading, teaching, talking, and playing together. ● Communicate guidelines to other caregivers, such as babysitters or grandparents, so that media rules are followed consistently. ● Engage in selecting and co-viewing media with your child, through which your child can use media to learn and be creative, and share these experiences with your family and your community. ● Have ongoing communication with children about online citizenship and safety, including treating others with respect online and offline, avoiding cyberbullying and sexting, being wary of online solicitation, and avoiding communications that can compromise personal privacy and safety. ● Actively develop a network of trusted adults (eg, aunts, uncles, coaches, etc) who can engage with children through social media and to whom children can turn when they encounter challenges.	

Percentage of Students Who Played Video or Computer Games 3 or More Hours per day 2009-2019

Counting time spent on things such as Xbox, PlayStation, an iPad or other tablet, a smartphone, texting, YouTube, Instagram, Facebook, or other social media, for something that was not school work, on an average school day

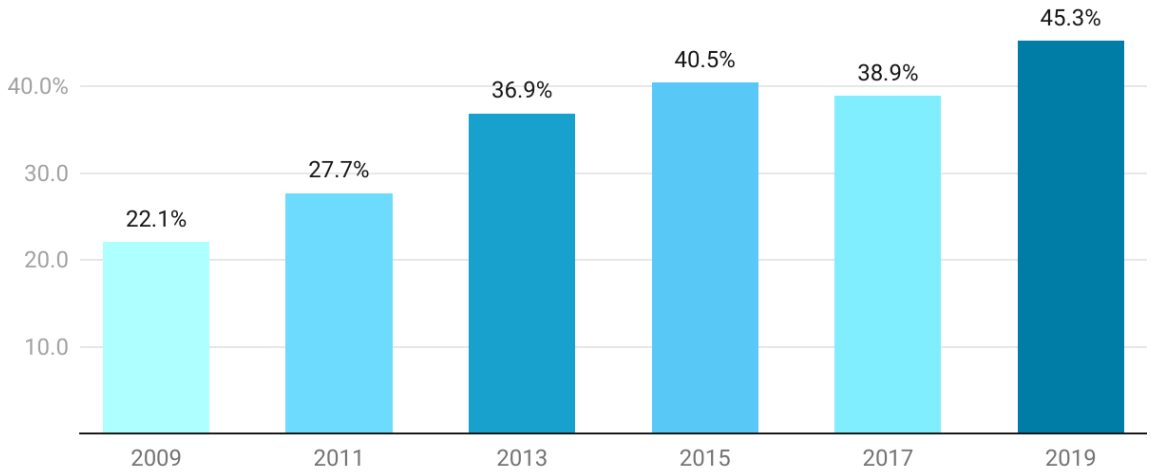

Chart: Rebekah Kamer • Source: Youth Risk Behavior Survey 2019 • Created with Datawrapper

Figure 22

Time Spent in Front of a TV, Computer, Cellphone, or other Electronic Device Children Age 0-17 Years in Arizona

2020-2021 National Survey

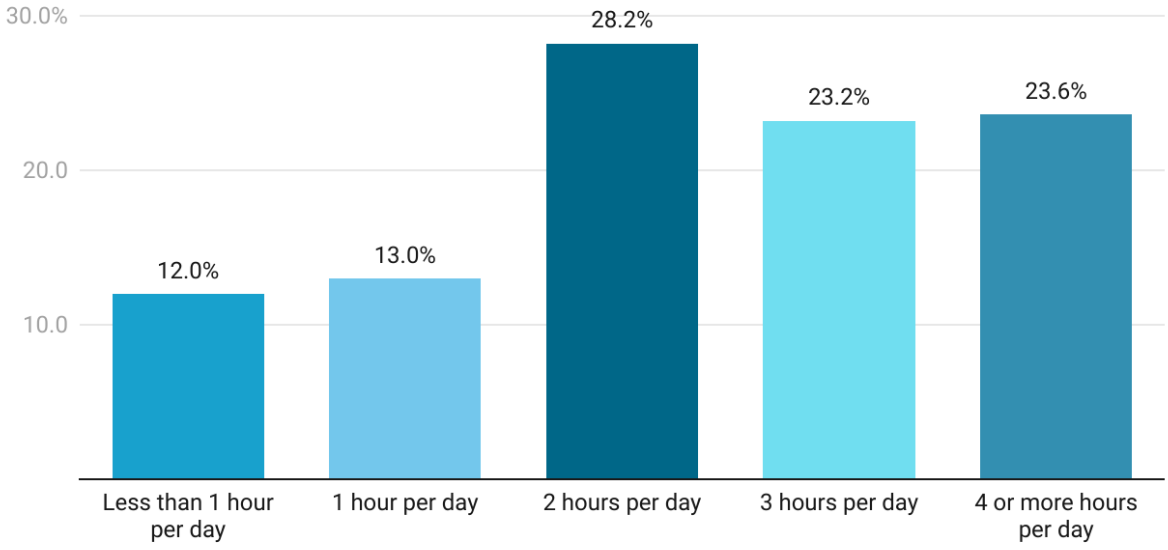

Chart: Rebekah Kamer • Source: Health Resources and Services Administration • Created with Datawrapper

Figure 23

The table in figure 23 displays concerning trends from the National Survey of Children's Health about screen-time among Arizona school-age children.[92] Kaiser Family Foundation tracked average screen time for 8–18 year olds nationally in 2010, discovering that children have an average of 7 hours and 38 minutes in front of a screen for entertainment every day. Because children are often using more than one type of media input at a time, average exposure was actually 10 hours and 45 minutes daily.[93] In 2019, Arizona YRBS results showed that 45.3% of respondents played video or computer games or used a computer 3 or more hours a day, and 19.7% reported watching television 3 or more hours a day. This did not include social media screen-time, nor did it capture the accessibility of cell phones by school-age youth. Data capturing this information is difficult to acquire, though the Pew Research Center suggests that 95% of U.S. teens have a smartphone or have access to one.[94] The same study found that 45% of teens are online almost constantly and Hispanic/Latino teens were more likely to report this behavior. The level of online activity conducted by school-age children presents unique challenges to safety as incidents of trafficking, kidnapping, and other abuses can be connected to online enticement. The National Center for Missing and Exploited Children shows 15.49% of the 2,260 children whose images were depicted online were enticed by someone from the internet.[95] According to the Deputy Chief for Policy and Legislation at the Child Exploitation and Obscenity Section of the U.S. Department of Justice, Alexandra Gelber, 40% of sex trafficking victims are recruited online.[96] Obvious data gaps exist in assessing the current overall use of media in K–12 populations. Several areas of focus that may be of interest for school health would include the following:

- how the pandemic may have affected rates of screen time in K–12 populations;
- discrepancies in use by ZIP code;
- crosswalking the social determinants of health with use; and
- deeper qualitative analysis on the types of media used and the effect on social and mental wellbeing.

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[92] Child and Adolescent Health Measurement Initiative. 2019–2020 National Survey of Children's Health (NSCH) data query. Data Resource Center for Child and Adolescent Health supported by the U.S. Department of Health and Human Services, Health Resources and Services Administration (HRSA), Maternal and Child Health Bureau (MCHB). Retrieved [08/10/22] from [www.childhealthdata.org].

[93] Rideout, V. J., Foehr, U. G., & Roberts, D. F. (2010). *Generation M2, Media in the Lives of 8- to 18-Year-Olds*. A Kaiser Family Foundation Study. Kaiser Family Foundation. Retrieved June 29, 2022, from https://kff.org/wp-content/uploads/2013/01/8010.pdf

[94] Anderson, M., & Jiang, J. (2021, May 27). Teens, Social Media and Technology 2018. Pew Research Center: Internet, Science & Tech. Retrieved June 28, 2022, from https://www.pewresearch.org/internet/2018/05/31/teens-social-media-technology-2018/

[95] *Our impact*. National Center for Missing & Exploited Children. (n.d.). Retrieved June 29, 2022, from https://www.missingkids.org/ourwork/impact

[96] The role of technology in human trafficking. United Nations : Office on Drugs and Crime. (n.d.). Retrieved June 29, 2022, from https://www.unodc.org/unodc/en/human-trafficking/Webstories2021/the-role-of-technology-in-human-trafficking.html

Environmental Safety

Air Quality

Air quality is measured with the Air Quality Index (AQI) which is a scale of degrees from 0 to 500 that measures the changes of the amount of pollution in the air.[97] There are 5 major pollutants that are tracked that contribute to the AQI including:

- Ground level ozone,
- Carbon monoxide,
- Sulfur dioxide,
- Nitrogen dioxide,
- Airborne particles, or aerosols.

Ground-level ozone and airborne particles have the greatest and most alarming effect on human health. The chart in figure 1.21 explores the levels of AQI and the meaning of the numerical value.

[97] National Oceanic and Atmospheric Administration. (2022). *How is air quality measured?* NOAA SciJinks – All About Weather. Retrieved August 5, 2022, from https://scijinks.gov/air-quality/

AQI Basics for Ozone and Particle Pollution

Air Quality Index Levels of Health Concern	Numerical Value	Meaning
Good	0 to 50	Air quality is considered satisfactory, and air pollution poses little or no risk.
Moderate	51 to 100	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusally sensitive to air pollution.
Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is not likely to be affected.
Unhealthy	151 to 200	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
Very Unhealthy	201 to 300	Health alert: everyone may experience more serious health effects.
Hazardous	301 to 500	Health warnings of emergency conditions. The entire population is more likely to be affected.

Table: Rebekah Kamer • Source: U.S. Air Quality Index • Created with Datawrapper

Figure 24

Because children and adolescents are smaller, they are at a higher risk for inhalation of air pollution as they breathe faster and more frequently resulting in more air intake in proportion to their body size than adults.[98] Children and adolescents are sometimes outside more often than adults, and are therefore more likely to be exposed to air pollutants. Air pollutants are associated with an increase in respiratory-related illness and disease in children and adolescents such as a reduction in lung function and an increase in severity and frequency of asthma attacks.

The American Lung Association has identified increasing pollutants and worsening air quality as an environmental health risk for Arizona students.[99] Currently, air pollution mitigation to reduce exposure to air pollutants and the health risks they pose in Arizona schools occurs in the following programs:[100]

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[98] Office of Children's Environmental Health. (2016). *Arizona Children's Environmental Health Program: Air*. Arizona Children's Environmental Health Program: AIR. Retrieved August 5, 2022, from https://legacy.azdeq.gov/ceh/air.html#:~:text=Air%20pollutants%20have%20been%20associated,including%20cancers%20and%20heart%20disease

[99] American Lung Association. (2022). *Arizona Air Quality Report Card*. Arizona | State of the Air | American Lung Association. Retrieved August 5, 2022, from https://www.lung.org/research/sota/city-rankings/states/arizona

[100] Office of Children's Environmental Health. (2016). *Arizona Children's Environmental Health Program: Air*. Arizona Children's Environmental Health Program: AIR. Retrieved August 5, 2022, from https://legacy.azdeq.gov/ceh/air.html#:~:text=Air%20pollutants%20have%20been%20associated,including%20cancers%20and%20heart%20disease

- Anti-Idle Campaign,
- School Bus Retrofit,
- Alternative Fuel Buses,
- Safe Routes to School,
- School Bus Idling Reduction Program.

Indoor air quality (IAQ) is an essential component of air quality to review as well since students spend most of their time indoors while at school. Good IAQ is essential because it affects health, academic performance, and the ability to concentrate. According to EPA, 1 out of 13 school-aged children has asthma which is the leading cause of school absenteeism due to chronic illness. Mitigation of respiratory disease transmission is connected to ventilation strategies and air quality. The CDC and Environmental Protection Agencies have developed guidance to accompany federal funding that enables LEAs to upgrade HVAC systems or improve ventilation with other strategies. [101]

Radon

Over long periods of time, exposure to high levels of radon gas increases a person's risk of developing lung cancer. Indoor radon exposure is the leading cause of lung cancer among individuals that do not smoke and lung cancer caused by radon exposure causes approximately 21,000 deaths each year in the United States. [102] Exposure to radon can begin in childhood; however, radon levels in Arizona remain largely unknown.

Radon is a natural gas that can be emitted from soil anywhere. However, the presence of radon goes unknown unless it is tested for because it is a colorless, odorless, and tasteless gas. Due to the increased risk of air pollution that children experience, it is important to test areas they spend time in for increased radon levels, such as schools. There are currently no laws or policies regulating the testing of radon in schools in Arizona. However, it is estimated that nearly 1 in 5 schools in the U.S. has at least one classroom with radon levels above the EPA's action level. [103]

The U.S. EPA and the ADHS Bureau of Radiation Control strongly recommend all schools test for radon. As part of the Bureau of Radiation Control's indoor surveillance and mitigation program, they provide assistance to schools across Arizona to conduct radon surveys and mitigation. ADHS additionally recently received a new grant as part of a block grant to improve awareness of radon and increase testing and tracking in Arizona.

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[101] Centers for Disease Control and Prevention. (n.d.). Ventilation in schools and childcare programs. Centers for Disease Control and Prevention. Retrieved January 2, 2023, from https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/ventilation.html#:~:text=Good%20ventilation%20is%20important%2C%20especially,using%20portable%20HEPA%20air%20cleaners

[102] Centers for Disease Control and Prevention. (2022, October 25). *What are the risk factors for lung cancer?* Centers for Disease Control and Prevention. Retrieved January 12, 2023, from https://www.cdc.gov/cancer/lung/basic_info/risk_factors.htm#aroundus

[103] Environmental Protection Agency. (n.d.). *Radon In Schools*. EPA. Retrieved January 12, 2023, from https://www.epa.gov/radon/radon-schools

Should a classroom or school test at or above the EPA's recommended action level, there are simple and cost-effective radon mitigation strategies that can be implemented to ensure Arizona's students are not being exposed to high levels of radon at school.

Extreme Heat

Extreme heat is defined as an extended period of time (2 or more days) where there is high humidity and temperatures above 90 degrees. Extreme heat can result in heat-related illness (HRI). Children are one of the populations who are at an increased risk for heat-related illnesses. [104] The most pressing signs of HRI include:

- Heat stroke and sunstroke,
- Heat syncope,
- Heat cramps,
- Heat exhaustion from water or salt depletion,
- General heat exhaustion,
- Heat fatigue,
- Heat edema.

Arizona State University conducted a study in 2021 called Heat Ready Schools to understand heat preparedness in South Phoenix schools. This study concluded that heat safety resources are available but not utilized in schools because school staff is overburdened and schools are underfunded, but education is one of the most helpful steps. [105] ADHS identifies the first steps in heat safety to include the development of formal heat policy. [106] [107] Many LEAs have a heat policy primarily located in the JJIB (Interscholastic Sports) section of the ASBA Policy Bridge, but many LEAs lack this policy. To keep children and adolescents safe both on school sites and elsewhere, education and awareness about when extreme heat warnings are in effect and how to prevent HRI is needed.

Due to having a higher surface area-to-body mass ratio and lower sweating capacity than adults, children get hotter from the environment more quickly, putting them at greater risk of heat-related illness. Between 2008 and 2021, over 3,000 school-age children (5-18 years old) visited emergency departments in

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[104] Arizona Emergency Information Network. (2019). *Extreme Heat*. Extreme Heat | Arizona Emergency Information Network. Retrieved August 5, 2022, from https://ein.az.gov/hazards/extreme-heat

[105] Shortridge, A., Walker VI, W., White, D., Guardaro, M. M., Hondula, D. M., & Vanos, J. (2021). Heatready schools: A novel approach to enhance adaptive capacity to heat through school community experiences, risks, and perceptions. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3979499

[106] Roach, M., & Tirdea, C. (2021). *Too Hot to Play? - Developing School Heat Policies in Arizona*. Extreme Weather and Public Health. Arizona Department of Health Services. Retrieved 2022, from https://www.azdhs.gov/documents/preparedness/epidemiology-disease-control/extreme-weather/pubs/too-hot-to-play-developing-school-heat-policies.pdf.

[107] *AZDHS: Epidemiology & Disease Control - Heat Safety*. Arizona Department of Health Services. (n.d.). Retrieved December 16, 2022, from https://www.azdhs.gov/preparedness/epidemiology-disease-control/extreme-weather/heat-safety/index.php#heat-schools

Arizona as a result of HRI (Fig. 25). The greatest incidence (43.2%) of HRI during this period was among those 16-18 years old, likely due to participation in after-school sports or outdoor activities. Consistent with Arizona's heat season, the majority of emergency department visits for HRI in children occur between May and September each year (Fig. 26). During these months between 2008 and 2021, an astounding 2,100 children sought care at emergency departments for illnesses related to heat.

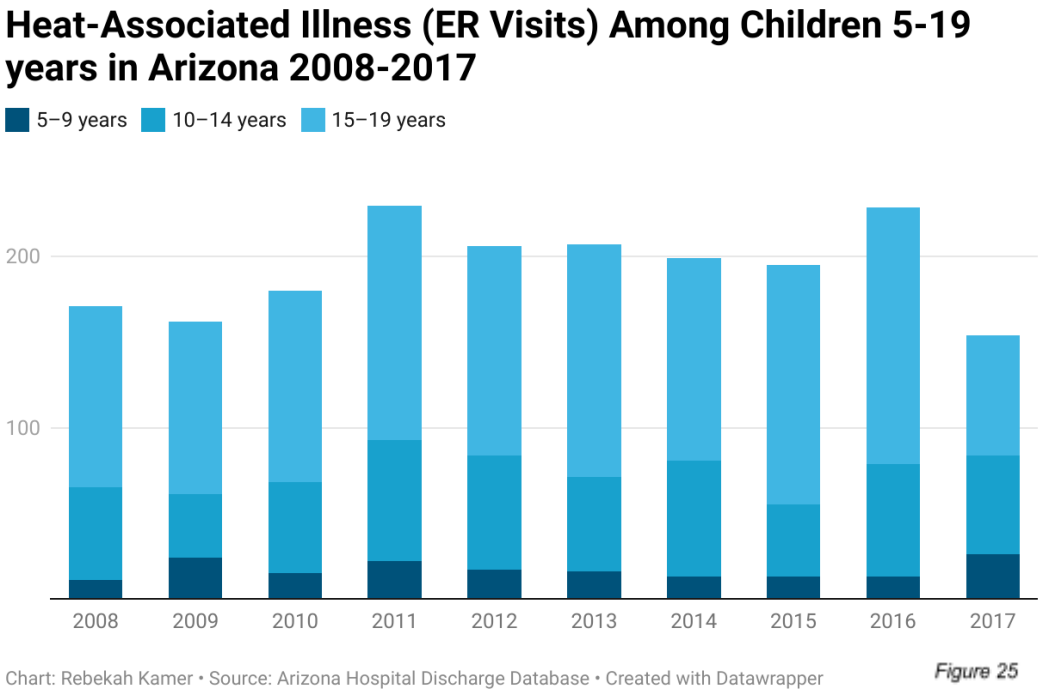

Figure 25

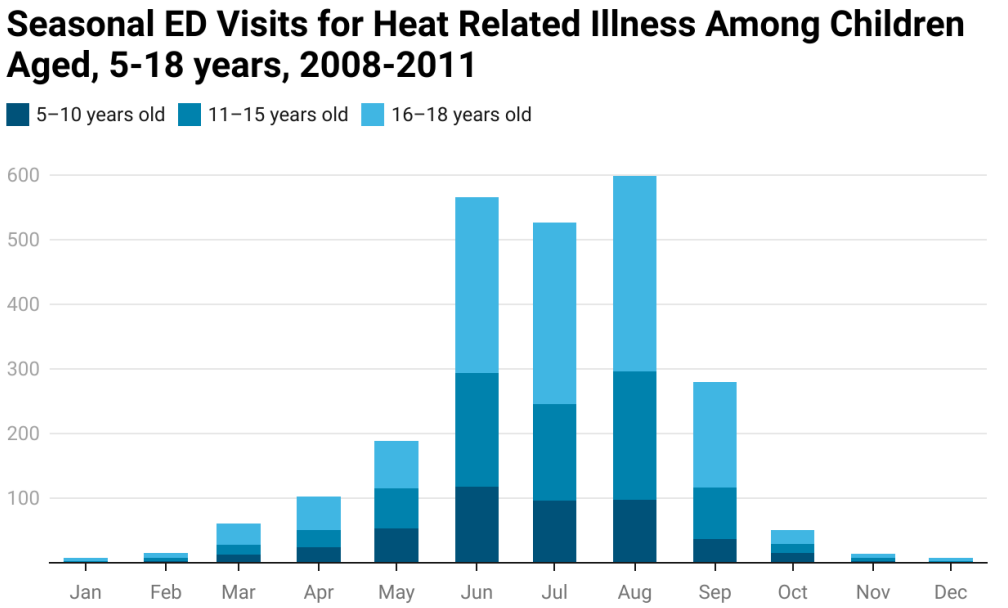

Figure 26

In order to address the gap in awareness and action for extreme heat in schools, ADHS has developed a set of school heat policies and recommendations that work in accordance with statute ARS 15-341 (A) (24). One of the primary mitigation strategies for HRI in children is through the hierarchy of controls, a system that focuses on the effectiveness of institution-level (school) prevention rather than prevention handled at the individual level (student). An example of this measure would be for the educational institution (school) to host recess indoors on days that meet the extreme heat criteria to eliminate exposure. However, other prevention methods may be more appropriate on days when heat intensity is lower, such as scheduling rehydration breaks during outdoor recess, moving outdoor activities to earlier in the day, or taking advantage of shaded areas. To better streamline the decision-making process and stay informed, schools can sign-up for heat alerts through ADHS. This tool will update schools about extreme heat warnings and when there is a high risk for heat-related illness.

Student athletes are a high-risk group for experiencing HRI. In order to mitigate this risk, ADHS recommends that schools implement an acclimatization period that allows athletes to adapt to heat exposure while exercising over the course of a few weeks. The acclimatization period may begin with shorter practices that gradually increase in duration over time, as well as slowly allowing the use of body equipment. Schools are also recommended to incorporate administrative controls to combat HRI in students and athletes. Some of these prevention strategies include the following:

- Provide shade structures or trees
- Move outdoor activities to shaded areas
- Plan for shade when developing or renovating school buildings, playgrounds, or athletic fields
- Encourage students to wear hats, sunglasses, and sunscreen outdoors
- Provide breaks during outdoor activities so that students can reapply sunscreen and get water

In addition to policies and guidelines to mitigate the risk of heat illness in children, ADHS has also developed a school heat safety toolkit through the Heat Illness Prevention School Project (HIPSP). This toolkit aims to further educate students, staff, and parents on the environmental conditions that can lead to HRI, as well as signs, symptoms, and prevention strategies. The contents of this toolkit include:

- Indoor activity booklet
- It's Hot Outside brochure and poster
- Heat-related illness word search and key
- School tip sheet
- Parent information sheet
- CDC training course on HRI prevention
- A heat index chart with tiered responses

Ultraviolet Radiation

Children and adolescents in Arizona are particularly vulnerable to overexposure to ultraviolet light coming from the sun as Arizona experiences a high amount of sunshine (a natural source of UV radiation) year-round. In fact, Arizona is the sunniest state in the United States, where cities across the state

experience anywhere from 70% to 90% sunshine annually. With more sunny days and the warmth of the Arizona climate, students are likely to spend an increased number of days outside for recess, outdoor activities, or after-school programs year-round, leading to an increased risk of overexposure to the sun and UV radiation at school.

UV rays can damage our skin and can lead to sunburns, early aging, wrinkles, skin discoloration, and skin cancer. As individuals, we generally experience most of our sun exposure by the time we turn 18 years old, meaning that it is vital we take proper precautions to protect our skin during this period. Overexposure can result in childhood sunburns that can cause skin cancer later in life.[108] Just one blistering sunburn before the age of 18 can double a person's risk of skin cancer as well as can any 5+ sunburns.

Skin cancer is the most common type of cancer in the United States and is largely preventable. Due to the facts that Arizona residents are at risk for overexposure to UV rays and children and adolescents have an opportunity to develop sun safe behaviors as well as are in the midst of experiencing their greatest sun exposures, the ADHS developed and implemented the Arizona SunWise Skin Cancer Prevention Program. Since 2003, the program has been providing services and programming to Arizona residents, schools, and organizations with the goal of improving the knowledge of and attitudes toward skin cancer prevention and promoting sun safe behaviors.

The SunWise Program has a School Program and has historically developed and presented presentations for students and teachers at assemblies, classrooms, fairs, and other school events to increase awareness of skin cancer and sun safety and ultimately improve student and engagement with sun safe behaviors. The SunWise Program looks forward to continuing to provide education to Arizona's students as well as implementing a train-the-trainer model to increase the reach of the program to more students across the state. In FY22, the SunWise Program provided direct education to approximately 1,577 K-12 students across the state of Arizona. However, it is unknown how many additional students the curriculum was taught to by educators and how many individuals received information via program education materials.

While schools across the state participate in sun safety programs like "SunWise" through Local Health Departments or University partnerships, the exact number of schools and students receiving sun safety curriculum is not known. This is part of a larger issue seen in sun safety education in the state–a data gap. A limiting factor of previous programming has been evaluating the effectiveness of sun safety education. Moving forward, there is a need to collect more data and conduct evaluations on sun safety education and behaviors in students throughout Arizona. For example, 15.5% of students surveyed in the Youth Risk Behavior Surveillance System (YRBSS) nationally in grades 9-12 reported rarely or never wearing sunscreen with an SPF of 15+ and that 57.2% reported being sunburned in 2017. However, Arizona does not participate in the Youth Risk Behavior Survey nor record other similar data.

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[108] Thoonen, K., Schneider, F., Candel, M. et al. *Childhood sun safety at different ages: relations between parental sun protection behavior towards their child and children's own sun protection behavior.* BMC Public Health 19, 1044 (2019). https://doi.org/10.1186/s12889-019-7382-0

In addition to education, it is important that schools and school districts implement interventions and policies to improve sun safety and decrease UV exposure on their campuses. Additional data may exist at the district level on built environment strategies for sun safety. Some of these prevention strategies include the following:

- Provide shade structures or trees
- Move outdoor activities to shaded areas
- Plan for shade when developing or renovating school buildings, playgrounds, or athletic fields
- Encourage students to wear hats, sunglasses, and sunscreen outdoors
- Try to avoid scheduling outdoor activities when the sun is strongest
- Provide breaks during outdoor activities so that students can reapply sunscreen and get water

Environmental Contaminants

Exposures to environmental contaminants have been linked to various illnesses, such as cancer, neurotoxicity, and hormone disruption. Children and adolescents in Arizona are particularly vulnerable to toxic exposures because they are still growing and developing. Children's intake of air and food is also proportionally greater than that of adults. Some of the most common and concerning contaminants they are exposed to include lead, arsenic, pesticides, mold, and more.[109] Exposure to contaminants in youth most often occurs from ingesting contaminated dust and dirt, drinking contaminated water, and breathing contaminated air. Current data sources make it possible to better understand how many children and adolescents are suffering from toxic exposures as well as the depth of its effects. Contributing factors of youth exposures in Arizona include:[110]

- 87% of children under the age of 18 live in counties with unhealthy ozone pollution.
- 170.6 million pounds of toxic chemicals were released in Arizona in 2018.
- 53% of public water utilities had drinking water violations in 2020 (national average is 32%).

Pesticides

In Arizona, there are no laws restricting use of pesticides in schools. In addition, the extent and use of pesticides in schools are not well known. Children may be exposed to pesticides at school through several different routes:

- Grounds Maintenance, i.e., weed control
- Public health pest control, i.e., control of rodent and insect pests such as ants, mice, cockroaches, fleas, and seasonal pests such as wasps and bees
- Contractors and farmers spraying grounds or fields next to schools
- Food supplied to the school or in lunchboxes

Children can be uniquely vulnerable to pesticide exposures because of developmental, dietary, and physiological factors. Exposure can occur through inhalation, ingestion, or dermal contact. Children

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[109] Shipherd, R. (2022). (publication). *EPA-funded Study Will Measure Soil and Dust Ingestion Levels in US Children*. University of Arizona . Retrieved 2022, from https://healthsciences.arizona.edu/newsroom/news-releases/2022/epa-funded-study-will-measure-soil-and-dust-ingestion-levels-us-children.

[110] Children's Environmental Health Network. (2020). Arizona Children's Environmental Health Profile.

exhibit frequent hand-to-mouth activity, which puts them at increased risk of exposure when compared to adults. Conducting a school assessment on pesticide use and exposure in children would provide insight into how to address this issue. Best practices for preventing pesticide exposure at schools include using an integrated pest management (IPM) system to reduce the application of pesticide use and reduce exposure to chemicals.

Lead

Lead is a potent neurotoxin that can cause adverse health effects, especially in young children. Even at low levels, lead can cause irreversible damage to children's hearing, growth, and development. Younger children of childcare age are most vulnerable to the effects of lead, but older children may be affected as well. Children can be exposed to lead through a wide range of sources, such as lead-based paint, which can be found in older houses, parents' occupations, toys, and imported spices.

ADHS recommends that all children in Arizona be evaluated for lead poisoning at 12 and 24 months of age. This entails a blood test for children in high-risk areas and a parent questionnaire for children not living in high-risk areas. Children that were not tested at 12 and 24 months should be tested for lead at least once before age 6. Older children should be tested if they have been identified to have a risk of exposure. On average, only about 11% of children under the age of 6 that live in high-risk zip codes are tested for lead.

Although children are usually only assessed for lead exposure in their homes, there is a concern that schools built before 1978 could have been painted with lead paint. The School Facilities Board is tasked with enforcing the Building Adequacy Guidelines, which serve as the minimum standards for existing and new school facilities in Arizona. These guidelines require that schools not have any exposed lead paint. The school facilities board also has funding available for schools for the purpose of correcting deficiencies such as the presence of lead-based paint or replacing lead-contaminated drinking water fixtures. The school Facilities Board only oversees public schools so there might be a gap in funding and oversight for charter and private schools.

Another exposure of concern for children is lead in drinking water. Lead contamination in drinking water can occur from the corrosion of lead pipes or other plumbing materials that contain lead. The State of Arizona has been and remains committed to addressing lead exposure through drinking water in childcare facilities and public schools in Arizona. In 2017, ADHS undertook a statewide project to test drinking water in licensed childcare facilities across the state. Over 2,000 drinking water samples were collected and analyzed from 1,055 facilities. In addition, the Arizona Department of Environmental Quality tested 16,125 samples of drinking water from 14,787 schools in 2016. About 4% of all fixtures screened were found to be above the EPA Action level (15 parts per billion) and required corrective action. At the time, the School Facilities Board worked with school districts to replace fixtures with confirmed lead levels higher than the screening level.

While drinking water has not historically been found as a cause of lead poisoning in Arizona, ADHS continues to take a proactive approach to protect Arizona's children. ADHS received a Lead Testing in

School and Child Care Program Drinking Water Grant from EPA in 2020 to address potential concerns of lead exposure through drinking water by offering voluntary water lead testing to charter schools. ADHS applied for funding in the subsequent years and has expanded the program to include lead testing in public schools and childcare facilities. ADHS has a partnership with the School Facilities Board to address any potential concerns of lead in the water. Many states have rules requiring schools to test for lead in their buildings. However, there are no rules in Arizona that require schools to test for lead. Therefore this is a limitation because schools can opt out of testing. For example, there are about 560 charter schools in Arizona, and only about 172 charter schools have decided to participate in the program thus far.

School Health Services - **HS / CPSS / SEC / FE / CI**

School health services provide frontline care for many students in Arizona, sometimes as the only accessible healthcare resource. More information is needed to accurately reflect the number of school nurses and health aides in schools. Furthermore, many school health professionals are given the title of "nurse", but the individual may not hold a professional licensure such as an R.N. or L.P.N. Preliminary district employment reports from ADE usually cite one nurse and one health aide per high school, with elementary schools sharing a nurse between several sites. A conversation with the president of the School Nurse Organization of Arizona (SNOA) estimated only 30–40% of schools have a nurse with some kind of certification, the actual number of any health professional at a site with or without certification is unknown. The U.S. Department of Health and Human Services and the CDC recommend one nurse for every 750 students, and at least one school nurse per school is recommended by the American Academy of Pediatrics; neither of these recommendations are met in Arizona. Furthermore, a consistent understanding of the term "nurse" to include formal credentials is needed. Anecdotal feedback from school administrators flags this as a misunderstanding when individuals with no certification or medical training are referred to as "our school nurse". As per ARS 32-1636, "only a person who holds a valid and current license to practice registered nursing in this state or in a party state pursuant to section 32-1668 may use the title 'nurse', 'registered nurse', 'graduate nurse' or 'professional nurse' or the abbreviation 'R.N.'." Formalized work to identify school health professionals and their level of credentialing is needed through collaboration between ADHS and ADE to understand school nursing and the shortage of professionals.

The current, albeit limited, understanding of the shortage of nurses in schools has many causes. Low pay, high levels of stress, and above acceptable student-nurse ratios are a few that have been identified.[111] To begin to address the issue, ADE has created the Arizona School Nurse Access Program (ASAP), which strives to retain and attract health professionals to the field. School nurses benefit schools in many ways. The National Association of School Nurses outlines five key benefits: attendance, academics, time, staff wellness, and accountability as ways that nurses add economic value to school environments.[112]

Schools that have one or more nursing staff have a positive effect on almost every aspect of school health outlined in this report. Nurses promote compliance with federal and state law, decrease absenteeism by helping to manage chronic health conditions for students and staff, assist with community based provision of clinical care services (immunizations, screenings, oral health, etc.), and help save lives by providing medical care in emergency situations.[113] Six areas prioritized in this report connected to school health services include communicable disease prevention, immunizations, oral

[111] Buttner, A. (2021, January 12). *The school nurse shortage: Covid-19 Impact & Moving Forward*. Frontline Education. Retrieved June 21, 2022, from https://www.frontlineeducation.com/blog/school-nurse-shortage/
[112] National Association of School Nurses. (2012). Five Ways a School Nurse Benefits the School. National Association of School Nurses.
[113] National Association of School Nurses. (2012). Five Ways a School Nurse Benefits the School. National Association of School Nurses.

health, concussions, stock medications, and students with special healthcare needs. The following sections provide further details.

Immunizations - HS / FE / CI

Immunizations are a safe and effective way to protect children from a myriad of deadly diseases.[114] The incidence of many vaccine-preventable diseases is low in Arizona and the US due to widespread immunization, and it is critical to maintain high levels of immunization across our state to maintain low incidence and prevent outbreaks. Many vaccine-preventable diseases are still circulating in the United States and around the world and are only an airplane ride away. Over the past 100 years, the lifespan of humans has increased significantly from the age of 50 in 1920 to age 79 in 2020.[115] This is largely due to clean water, sanitation, and most notably the development and introduction of widespread vaccine administration. Furthermore, not only do immunizations prevent sickness and death from diseases such as COVID-19, influenza, polio, pertussis, measles, and more, but vaccines also contribute to gains in educational and economic development.[116] Furthermore, many of these diseases, such as polio or measles, can cause life-long health issues. According to the World Health Organization, immunizations currently prevent 4 to 5 million deaths per year world wide. Figure 26 on page 55, displays a table exploring incidences of disease in the U.S. both before and after vaccine introductions.[117]

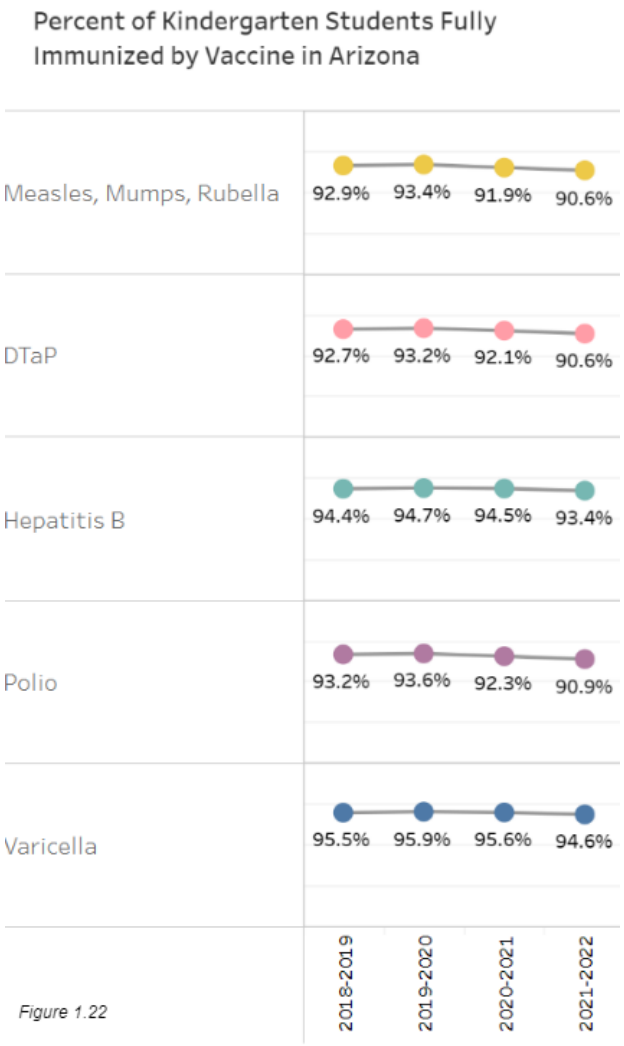

Figure 1.22

Figure 27

In the last 50 years, vaccines have led to a 95% decrease in vaccine-preventable diseases.[118] Preliminary data being gathered by ADHS shows a reduction from 2019-2022 in administered routine childhood vaccines (fig. 27). Historically, many children were not immunized because their families lacked access to primary

[114] The National Committee for Quality Assurance. (2020, December 15). *Immunizations for adolescents*. NCQA. Retrieved April 1, 2022, from https://www.ncqa.org/hedis/measures/immunizations-for-adolescents/
[115] Schanzenbach, D. W., Nunn, R., & Bauer, L. (2016, June). The Changing Landscape of American Life Expectancy. Washington DC; The Hamilton Project.
[116] World Health Organization. (2019, December 5). *Immunization*. World Health Organization. Retrieved April 1, 2022, from https://www.who.int/news-room/facts-in-pictures/detail/immunization
[117] Rodrigues, C. M., & Plotkin, S. A. (2020). Impact of vaccines; Health, economic and Social Perspectives. *Frontiers in Microbiology*, *11*. https://doi.org/10.3389/fmicb.2020.01526
[118] Shefer, A., Briss, P., Rodewald, L., Bernier, R., Strikas, R., Yusuf, H., Ndiaye, S., Wiliams, S., Pappaioanou, M., & Hinman, A. R. (1999). Improving immunization coverage rates: An evidence-based review of the literature. *Epidemiologic Reviews*, *21*(1), 96–142. https://doi.org/10.1093/oxfordjournals.epirev.a017992

healthcare due to insurance status or geographic proximity. Historical trauma resulting from vaccine experiments like the Tuskegee Syphilis Study (as recent as 1972), long standing government abuse and neglect of Indigenous peoples, and many other examples affecting marginalized populations also contribute to mistrust of the government and public health. The Arizona Department of Health Services runs a program called Vaccines for Children (VFC) to ensure that affordable vaccines are available to all children. The Vaccines for Children program is a federally funded program that provides vaccines at no cost to children who might not otherwise be vaccinated because of an inability to afford vaccines. This program is administered at the state level by the ADHS Bureau of Immunization Services and is available at many local health departments.

Lower vaccination rates are also due to increasing vaccine hesitancy in some populations and growing distrust of the medical and public health systems. Vaccination education fairs and outreach to these communities via trusted community members or partners are effective in increasing vaccination rates. Programs aimed at decreasing vaccine hesitancy in all communities must be strengthened.

The table in figure 28 describes incidences of disease in the U.S. before and after the introduction of widespread vaccination.[119]

Incidence of Disease Before and After Vaccine Introduction

Vaccine	Peak cases in prevaccine era (year)	Vaccine coverage in children 19-35 months old (%[95% CI])	Cases in 2017	Disease Reduction %
Smallpox	110,672 (1920)		0	100
Diptheria	30,508 (1936)	94.0 (93.3-94.7)	0	100
Measles (non-imported)	763,094 (1958)	91.5 (90.6-92.3)	99	100
Mumps	212,932 (1964)	91.5 (90.6-92.3)	6	97
Rubella	488,796 (1964)	91.5 (90.6-92.3)	7	100
Congenital rubella syndrome	200,000 (1964-65)		5	100
Pertussis	265,269 (1934)	94.0 (93.3-94.7)	19	93
Polio (paralytic)	21,269 (1952)	92.7 (91.9-93.5)	0	100
Tetanus	601 (1948)	94.0 (93.3-94.7)	33	95

Table: Rebekah Kamer • Source: Rodriques & Plotkin, 2020 • Created with Datawrapper

Figure 28

[119] Rodrigues, C. M., & Plotkin, S. A. (2020). Impact of vaccines; Health, economic and Social Perspectives. *Frontiers in Microbiology*, *11*. https://doi.org/10.3389/fmicb.2020.01526

Communicable Disease Prevention - **HS / FE / CI**

School health personnel play a critical role in the promotion of health behavior promotion that mitigates the spread of communicable disease. The COVID-19 pandemic provided an opportunity to evaluate mitigation measures and their effectiveness, and evidence continues to support the role of everyday strategies at the personal, administrative, and environmental levels pertaining to prevention. Cross-cutting strategies like staying home when sick, respiratory etiquette (covering coughs or sneezes), proper handwashing, and staying up to date with vaccination can impact the spread of disease. There is potential to examine the spread of disease in schools based on the levels of certified health staff at the site. This would address the question if having a school nurse prevents disease transmission in school settings. Further examination is needed to address the links between policies where classroom attendance is directly connected to academic performance and funding, as this plays a role in the ability to promote strategies like staying home when sick.

Arizona law outlines how any student with, or recovering from, a communicable disease as outlined in R9-6-203, will not be permitted in school until the period of contagion is passed or until a physician recommends a return, in accordance with A.R.S. §36-621 et seq., appropriate regulations of the Arizona Department of Health Services, and policies of the County Health Department. Public health services related to communicable disease support services by a local or state health department epidemiology are outlined by A.R.S. §36-104(1)(b)(ii).

Oral Health - **HS / FE / CI**

Clear evidence exists on the impact of poor oral health on school learning and behavioral outcomes. Oral health is the top reason for missed school days for students nationally. Children with poorer oral health status are 4 times more likely to experience dental pain, miss school, and perform poorly in school. These findings suggest that improving children's oral health status may be a vehicle to enhancing their educational experience.[120] As highlighted in previous sections of this report, socio-economic indicators show a correlation between the high prevalence of tooth decay and lower income schools.[121] Treatment rates in White children exceed the rates of treatment experienced by their American Indian and Hispanic/Latino counterparts.

[120] Jackson, S. L., Vann, W. F., Kotch, J. B., Pahel, B. T., & Lee, J. Y. (2011). Impact of poor oral health on Children's school attendance and performance. *American Journal of Public Health*, *101*(10), 1900–1906. https://doi.org/10.2105/ajph.2010.200915

[121] Arizona Department of Health Services. (2015, December). Healthy Smiles Healthy Bodies Data Brief 2015. Phoenix.

School-based oral health programs are an essential access point for children to receive preventive oral health services and were severely impacted by school closures and COVID-19 mitigation measures during the pandemic. As a result, many children did not receive much needed oral health screenings, referrals, or preventive care. One Mott Poll highlighted this impact, where 1 in 3 parents reported it was harder for them to get to the dentist because of the pandemic.[122] A report based on this poll cited barriers being more frequent in Medicaid-enrolled children. School sealant programs are especially important for reaching children who are at greater risk for developing cavities and less likely to receive private dental care. Assessing the collaboration between public health, community dentistry, and schools may help to reduce these disparities by encouraging creative ways to provide access to kids who need it most.

[122] Clark, S. J., Freed, G. L., Singer, D. C., Gebremariam, A., & Schultz, S. L. (2021, February 15). Pandemic-posed challenges to children's oral health. Ann Arbor; C.S. Mott Children's Hospital Michigan Medicine.

Sensory Screenings - **HS / FE / CI**

Hearing Screening

Hearing screenings are mandatory for children of certain grades in Arizona and are intended to, “identify individuals who may require a more comprehensive hearing assessment and/or medical management,” as defined by the American Speech-Language-Hearing Association. Hearing screenings for children and adolescents are vital for early detection and preventing hearing loss and are a priority when considering their health. Failure to detect hearing loss can cause: [123]

- Lifelong deficits in speech and language acquisition,
- Poor academic attainment,
- Personal and social maladjustments,
- Emotional difficulties.

Hearing screening is required for all public schools and any charter or preschool that receives public funding. Not all grades are required to receive hearing screenings; only preschool, kindergarten, 1st, 3rd, 5th, 7th, and 9th, as well as any student who needs to repeat a grade level. Other screening requirements may include: students enrolled in special education, students who did not pass a re-screening the previous year, and a request for a child to be screened. Hearing screenings are well established in Arizona schools with vital support from county health departments.

Annual reporting of hearing screening is required by state law and is collected and reviewed by the Arizona Department of Health Services. From the reported data, a decrease in school-based hearing screening has occurred since the onset of the COVID-19 pandemic, with a 35% decrease in screening from the 2019–2020 school year to the 2020–2021 school year. Even though the end of the 2019–2020 school year was not held in-person, the majority of screenings take place at the start of the school year; therefore, school shutdowns did not impact it as it did the 2020–2021 year.

Vision Screening

Vision screenings identify, test, and evaluate a student's vision and aims to identify when medical intervention or accommodations are needed.[124] Vision screening was not previously mandated in Arizona until Senate bill 1319 passed in 2019, requiring vision screenings in schools. The Arizona Department of Health Services recently submitted the rules surrounding this requirement, which are currently undergoing review by the Governor’s Regulatory Review Council. The new rules, if approved, will be in effect in time for the 2023–2024 school year.

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[123] American Speech-Language-Hearing Association. (2022). *Childhood hearing screening*. American Speech-Language-Hearing Association. Retrieved June 14, 2022, from https://www.asha.org/practice-portal/professional-issues/childhood-hearing-screening/

[124] *Arizona legislature*. Arizona Legislature. (2022). Retrieved June 21, 2022, from https://www.azleg.gov/viewdocument/?docName=https%3A%2F%2Fwww.azleg.gov%2Fars%2F36%2F00899-10.htm

Reporting of vision screenings has also not been mandatory, but many LEAs that conduct screenings submit their results to the Arizona Department of Health Services. Similar to hearing screenings, there has been a decrease in vision screenings since the onset of the COVID-19 pandemic with a 35% decrease in vision screenings from the 2019–2020 school year to the 2020–2021 school year.

Stock Medications - **HS**

The exact number and types of medical emergencies that occur at school sites in Arizona is unknown. Three specific medical emergencies that occur at schools include asthma attacks, allergic reactions, and poisonings/accidental ingestion. These exemplify quantifiable emergencies with potentially severe consequences that can be prevented with stock medication programs administered by certified or licensed health staff. For the purposes of this report, stock medications include albuterol sulfate inhalers, epinephrine, and naloxone. Each of these stock medication programs require separate training, funding, and standing orders. Funding for stock medication programming is inconsistent, blending a mix of grant funds, local health department funding, and at times school funds. The Western Regional Public Health Training Center provides free online training for all three of these programs, but acquiring the medication continues to be a barrier. Some Arizona schools have collaborated with LHD medical directors to write standing orders, though not all LHDs have this capacity. Each of these medical emergencies present unique opportunities and challenges related to the implementation of response within school systems.

Key Considerations about Asthma in Children and Adolescents

- Asthma-related medical events are among the leading causes of chronic absenteeism in U.S. schools.[125]
- Current data from the CDC highlights disproportionate death experienced by African-American populations and females.[126]
- A pilot albuterol program implemented in a school district in Tucson, Arizona produced a 20% reduction in asthma-related 9-1-1 calls and a 40% reduction in asthma-related EMS transports, and broader implementation in Pima County resulted in 84% of students experiencing asthma attacks returning to the classroom versus needing escalating medical services.[127]
- The Arizona Asthma Coalition estimates the cost of a stock albuterol program at $114, including program overhead.[128]

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[125] Centers for Disease Control and Prevention. (2022, February 24). Asthma. Centers for Disease Control and Prevention. Retrieved June 27, 2022, from https://www.cdc.gov/healthyschools/asthma/index.htm

[126] Centers for Disease Control and Prevention. (2022, May 25). *Most recent national asthma data*. Centers for Disease Control and Prevention. Retrieved January 2, 2023, from https://www.cdc.gov/asthma/most_recent_national_asthma_data.htm

[127] Gerald LB, Snyder A, Disney J, et al. Implementation and Evaluation of a Stock Albuterol Program for Students with Asthma. Ann Am Thorac Soc. Feb 2016;13(2):295–6. doi:10.1513/AnnalsATS.201510-683LE

[128] *Arizona Asthma Coalition*. Arizona Asthma Coalition - Albuterol Program FAQs. (n.d.). Retrieved June 27, 2022, from https://www.azasthma.org/Albuterol-Program-FAQs

- Calculations of financial loss due to student absenteeism including medical cost, disproportionate effect on parents experiencing poverty, and loss of educational attainment are not currently available at the local level.
- 2014 data shows 10.9% of children aged 17 years and younger reporting to have asthma, compared to the 9.2% nationally. [129]
- Population studies suggest that 20%-70% of people with asthma remain undiagnosed, [130] although a significant gap exists in research.

Key Consideration about Allergic Reactions in Children and Adolescents

- Anaphylaxis from allergic reactions resulting in emergency department visits increased between 2005–2014. [131]
- The AAP published a study in 2018 citing food allergies as an emerging public health concern affecting an estimated 8% of children in the U.S. [132]
    - Of the children studied, 42% had visited the emergency room at least once due to an allergic reaction.
- The Arizona Resource Guide For Supporting Children With Life-Threatening Food Allergies cites an estimated 25% of allergic reactions in school-age children happened at school, of which 79% occurred in the classroom.
- Cost estimates for a single hospitalization due to anaphylaxis in 2012 range from $5,899 to $19,420.[133] [134]
- A separate article estimates hospitalization costs to be estimated at. This same study shows stock epinephrine in 2019 to cost $715 for a twin pack; not exceeding the estimated $338 cost per school year is the best way to make this a viable option. [133] [134]

Since the declaration of a Public Health Emergency in 2017 to address the rising opioid crisis, the supply and use of naloxone for the general public has increased. In 2020, there were 60 opioid related deaths in children 17 or younger, 57 of these were caused by fentanyl.[135] In November of 2018, ADHS authorized a standing order for the dispensing of naloxone to eligible individuals for administration to any individual 5

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[129] American Lung Association; Arizona Department of Health Services. (2016). *The 2016 Arizona Asthma Burden Report*. Arizona Asthma Coalition. Retrieved from https://azasthma.org/resources/Documents/Asthma%20Burden%20Report.pdf

[130] Aaron SD, Boulet LP, Reddel HK, Gershon AS. *Underdiagnosis and Overdiagnosis of Asthma*. Am J Respir Crit Care Med. 2018 Oct 15;198(8):1012-1020. doi: 10.1164/rccm.201804-0682CI. PMID: 29756989.

[131] Motosue, M. S., Bellolio, M. F., Van Houten, H. K., Shah, N. D., & Campbell, R. L. (2017). Increasing emergency department visits for anaphylaxis, 2005–2014. The Journal of Allergy and Clinical Immunology: In Practice, 5(1). https://doi.org/10.1016/j.jaip.2016.08.013

[132] Gupta RS, Warren CM, Smith BM, Blumenstock JA, Jiang J, Davis MM, Nadeau KC. The public health impact of parent-reported childhood food allergies in the United States. Pediatrics. 2018;142(6):e20181235.

[133] *Candrilli*, S., & Kurosky, S. K. (2015, November 15). *Recent Trends In Anaphylaxis-Related Hospitalization In The United States*. valueinhealthjournal.com. Retrieved June 28, 2022, from https://www.valueinhealthjournal.com/article/S1098-3015(15)03504-4/fulltext?_returnURL=https%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS1098301515035044%3Fshowall%3Dtrue#%20

[134] Shaker MS, Greenhawt MJ. Analysis of Value-Based Costs of Undesignated School Stock Epinephrine Policies for Peanut Anaphylaxis. JAMA Pediatr. 2019 Feb 1;173(2):169–175. doi: 10.1001/jamapediatrics.2018.4275. PMID: 30575857; PMCID: PMC6439603.

[135] Griffin, A., et al (2021, November 15). Arizona Child Fatality Report

years or older.[136] Though the standing order allows for the distribution and use of naloxone in schools, the number of times it has been administered is not known. It is also unknown if school staff, including health professionals, are trained in the administration of naloxone.

The data currently available for stock medications in schools are currently insufficient. Additionally, resources and knowledge among LEAs about available stock medication funding and programs is limited, contributing to students going underserved and experiencing more health emergencies.

[136] Opioids. Office of Education | Office of the Arizona Governor. (2018, November 8). Retrieved July 11, 2022, from https://education.azgovernor.gov/edu/opioids

Children and Youth with Special Healthcare Needs (CYSHCN) - **HS / CPSS / SEC / PEnv / FE / CI**

An estimated 220,000 students (20%) in Arizona schools meet the definition for Children and Youth with Special Healthcare Needs (CYSHCN), a population which requires additional resources and accommodations. The Health Resources and Services Administration defines CYSHCN as: “children who have or are at increased risk for chronic physical, developmental, behavioral, or emotional conditions. They also require health and related services of a type or amount beyond that required by children generally.” There are fifteen categories of disability outlined by the Individuals with Disabilities Education Act (IDEA) that qualify an individual for special education services. According to ADE, 12.38% (137,569) of Arizona students ages 6 to 21 have Individual Education Plans (IEPs) qualifying them for service provision, but only 93,589 students utilized these services. There is a need to identify the remaining estimated 43,980 CYSHCN with an emphasis on the barriers preventing IDEA services.

CYSHCN are at higher risk for bullying, teen pregnancy, sex trafficking, co-occuring conditions, and social isolation.[137] There is a significant gap in identification of the number of CYSHCN in Arizona, which may be due to stigmatization, lack of awareness, inaccessible diagnostic capability, or inability to access care. A broad number of diagnoses exist under the umbrella of CYSHCN, and even if a diagnosis is similar for a group of children, the resources to provide care coordination for individuals may be substantially different. Some CYSHCN need a higher level of care that requires certification or specified training. This point is especially important in highlighting the need for school nurses with professional licensure.

The data gap identifying CYSHCN and specificity of diagnosis needs further exploration as it pertains to social determinants of health and equity. National research highlights disparities related to income, race, ethnicity, sex, and gender identity. Findings identify 23.8% of CYSHCN live in poverty, whereas 19.4% of overall non-CYSHCN live in poverty.[138] The AAP also highlights findings where CYSHCN were more likely than non-CYSHCN to be male, older, non-Hispanic Black, live in poverty, and have public insurance”.[139] Resources supporting CYSHCN and their families exist, but barriers to access are not yet fully understood and documented and may affect some communities more than others.

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[137] Arizona State Univeristy School of Social Work. (2020). *What You Need to Know Sex Trafficking and Sexual Exploitation in Speical Education a Training Tool for Special Educators, Administrators and Support Staff*. Tempe, Arizona; Arizona State University School of Social Work. Retrieved 2022, from https://mcusercontent.com/7bd0f5a56287e95a3bd0b1eb1/files/c8ec123e-1bb3-ad63-1a9e-6734cc129ec8/90018_Trafficking_Traning_Brochure_Special_Education_low_res.pdf.

[138] Houtrow, A., Martin, A. J., Harris, D., Cejas, D., Hutson, R., Mazloomdoost, Y., & Agrawal, R. K. (2022, June 1). *Health Equity for Children and Youth With Special Health Care Needs: A Vision for the future*. American Academy of Pediatrics. Retrieved August 12, 2022, from https://publications.aap.org/pediatrics/article/149/Supplement%207/e2021056150F/188222/Health-Equity-for-Children-and-Youth-With-Special

[139] Ghandour, R. M., Hirai, A. H., & Kenney, M. K. (2022, June 1). *Children and youth with special health care needs: A profile*. American Academy of Pediatrics. Retrieved August 12, 2022, from https://publications.aap.org/pediatrics/article/149/Supplement%207/e2021056150D/188226/Children-and-Youth-With-Special-Health-Care-Needs

Where COVID-19 is concerned, families who have CYSHCN as well as those with special healthcare needs identified themselves as struggling more during the height of the pandemic. A study from January 2021 highlighted over-representation of socio-demographically disadvantaged people with disabilities in counties with high COVID-19 community rates compared to other people with disabilities.[140] Additionally, the U.S. Department of Health and Human Services (HHS) cites concerns about healthcare workforce shortages negatively affecting CYSHCN for support and care. COVID-19 exacerbated the gaps that already existed for CYSHCN. The AAP conducted a survey during the pandemic to identify the differences of the impact of COVID-19 on families with CYSHCN compared to families without a CYSHCN in the house. Key factors and important takeaways from this survey include:[141]

- Most parents with CYSHCN accessed services before and during the pandemic including case management, care coordination, therapeutic care, social work, mental/behavioral health services, special education, and home health care.
- The number of parents in household with CYSHCN reporting family violence was higher than parents in households without CYSHCN:
    - Physical and/or emotional Intimate Partner Violence (IPV) was reported by 30% of families with CYSHCN compared to 17% in families without.
    - Physical IPV was reported by 17% of families with CYSHCN compared to 7% in families without.
    - Emotional IPV was reported by 26% of families with CYSHCN compared to 15% in families without.

Many caregivers and parents of CYSHCN expressed increased stress due to negative economic impact and feeling overwhelmed with providing medical and therapeutic care during the time when the healthcare sector was severely strained. It is important to address not only the concerns and needs of individuals with special health care needs but their caregivers as well because their well being often impacts the child.

[140] Chakraborty, J. (2021). Social inequities in the distribution of COVID-19: An intra-categorical analysis of people with disabilities in the U.S. *Disability and Health Journal*, *14*(1), 101007. https://doi.org/10.1016/j.dhjo.2020.101007
[141] American Academy of Pediatrics. (2021, August 27). *The impact of the Pandemic on Households with CYSHCN*. Family Snapshots: Life During the Pandemic. Retrieved August 2022, from https://www.aap.org/en/patient-care/family-snapshot-during-the-COVID-19-pandemic/the-impact-of-the-pandemic-on-households-with-cyshcn/

Concussions - HS / CPSS

Adolescent concussions have a significant impact on student learning. Continued education and involvement from the Arizona Interscholastic Association (AIA) and LEA athletic departments appear to be having a positive effect in reducing concussion rates in adolescents age 5–18. Currently, there is incomplete data on youth concussions largely due to a high prevalence of undiagnosed concussions and the absence of a more robust national and state surveillance systems for concussions. The need for increased access to affordable health care as well as a concussion surveillance system has been identified by experts. Current concussion data identifies falls, mostly sports related, as the leading cause of traumatic brain injuries (TBIs) in school-age children. The AIA requires athletes to participate in a video education event, parent acknowledgement, and coach training about concussion awareness and how to best treat them.[142] The CDC recommends this training be extended to the parents and other individuals involved in athletics such as coaches.

Key Considerations about TBIs in Children and Adolescents

- Most concussions are preventable.[134]
- Secondary concussions or concussions without adequate post-trauma care are the most damaging form of concussion.[143]
- Major TBIs are typically caused by multiple minor TBIs such as repeat concussions that are often under-treated or not identified at time of injury.[134]
- In Arizona in 2020, children 5–19 years old accounted for 28.8% of all deaths from a major TBI, with 18.3% of those deaths occurring in youth ages 15–19.[144]

Education and awareness regarding point-of-care treatment and intervention can reduce the occurrence of severe TBIs. Hospital discharge processes that include referrals and/or follow-up notes to primary care providers, school health offices, concussion specialists, and parents or guardians of the individual diagnosed with a concussion increase the monitoring of symptoms and the recovery plan, resulting in better health outcomes for the child.

Additionally, TBI research and programming funding needs to be addressed. Presently, there is no position at ADE or at ADHS to coordinate or evaluate TBIs. Although TBIs are covered under the Individuals with Disabilities Education Act (IDEA) (34 C.F.R. § 300.8(a)), access to a diagnosis qualifying an individual for special education prevents disability service provision for many students experiencing a

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[142]Arizona Interscholastic Association. (2022). Sports Medicine.

[143] Mullins, T., Bradley, G., Fisher, B., Mahankali, S. V., Benkert, M., & Vossbrink, A. (2020). State Trauma Advisory Board 2020 Annual Report. Phoenix; Arizona Department of Health Services- Bureau of Emergency Medical Services and Trauma System.

[144] Mullins, T., Bradley, G., Fisher, B., Chikani, V., Mahankali, S. V., Benkert, M., & Vossbrink, A. (2021). State Trauma Advisory Board 2020 Annual Report. Phoenix; Arizona Department of Health Services.

TBI in the school setting. Currently, in order for service provision for students who have had a TBI to occur within school systems, there must be a secondary diagnosis to allow for billing. Therefore, children are integrated with other students with behavioral health needs, making recovery from a TBI particularly challenging for individuals as proper accommodations are not made. Additional data collection and guidance are needed to better address this under prioritized issue.

Effects of TBIs on Children and Adolescents

TBIs such as concussions affect children differently than adults. TBIs of any severity can:[145]

- Disrupt development,
- Limit a child's ability to participate in academic and athletic activities,
- Result in changes in a child's thinking, health, and behavior that impact self-regulation, social skills, and learning abilities.

There have been efforts to implement requirements for hospitals treating a child or adolescent with TBI to inform multiple entities. A concussion coalition in Arizona had proposed that if a diagnosis was issued to a student, at discharge, patient notes would be distributed to the school, primary care provider, concussion specialist, and parent or guardian that covered the signs and symptoms to watch for, while providing effective notes for post concussion care and recovery. Though more research is needed into the amount of school missed due to TBI, better monitoring of this health concern is needed.

[145] Centers for Disease Control and Prevention. (2016, January 22). *Report to Congress on the management of TBI in children*. Centers for Disease Control and Prevention. Retrieved April 1, 2022, from https://www.cdc.gov/traumaticbraininjury/pubs/congress-childrentbi.html

Nutrition Services and Environment - **HS / NES / SEC / PEnv**

Hunger and food insecurity is a pervasive issue that affects many children in Arizona with 1 in 6 children and adolescents frequently going hungry and 19% facing food insecurity.[146] These data points were calculated in 2019 and it is estimated that the COVID-19 pandemic has made hunger and food insecurity worse. Food insecurity is a social and economic condition in which access to food is sparse and/or unknown.[147] Food insecurity often occurs in tandem with other issues such as affordable housing, medical costs, low wages, etc.[148] Food insecurity causes a myriad of health problems in which children and adolescents are more susceptible to because they are still growing and developing. Food insecurity in children has been associated with:[149]

- Anemia,
- Asthma,
- Depression and anxiety,
- Cognitive and behavioral problems,
- Higher risk of hospitalization.

School nutrition services environments provide unique opportunities to reduce food insecurity by improving access to meals and shaping positive dietary behaviors. The CDC WSCC model defines nutrition services environment in the following way:

> "*The school nutrition environment provides students with opportunities to learn about and practice healthy eating through available foods and beverages, nutrition education, and messages about food in the cafeteria and throughout the school campus…School nutrition services provide meals that meet federal nutrition standards for the National School Lunch and Breakfast Programs, accommodate the health and nutrition needs of all students, and help ensure that foods and beverages sold outside of the school meal programs (i.e., competitive foods) meet Smart Snacks in School nutrition standards…"*

School nutrition education and services are utilized by most children in the U.S. and are composed of several programming components including; access to nutritious breakfast, lunch, and afterschool snack; nutrition education, and local procurement through farm to school initiatives. Nutrition education via health education programming takes place in some schools through the Supplemental Nutrition Assistance Program Education (SNAP-Ed) policy, systems, and environmental change work which includes nutrition environment assessments and improvements through Smarter Lunchrooms, Local Wellness Policy assessments, and other direct nutrition education efforts.

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[146] Feeding America. (2019). *What Hunger Looks Like in Arizona*. Map the Meal Gap. Retrieved June 22, 2022, from https://www.feedingamerica.org/

[147] America's Health Rankings analysis of U.S. Department of Agriculture, Household Food Security in the United States Report, United Health Foundation, AmericasHealthRankings.org, accessed 2022.

[148] America's Health Rankings analysis of U.S. Department of Agriculture, Household Food Security in the United States Report, United Health Foundation, AmericasHealthRankings.org, accessed 2022.

[149] America's Health Rankings analysis of U.S. Department of Agriculture, Household Food Security in the United States Report, United Health Foundation, AmericasHealthRankings.org, accessed 2022.

The 2019 Arizona YRBS data indicates that 17.4% of students surveyed are overweight as determined by BMI calculation based on their self-reported height and weight. Thirty-three percent of students surveyed reported perceiving themselves as overweight. The disparities in these percentages highlights a trend in unhealthy and inaccurate body image. To complicate these trends further, an additional 49% reported trying to lose weight in the last year. Nearly 20% did not eat breakfast for any of the 7 days prior to taking the YRBS. The YRBS continues to gauge healthy eating behaviors through returning and newly added questions such as how often a student is eating green salad or carrots in the last 7 days as well as if a student is engaging in eating disorder behaviors such as binging or overeating. The YRBS serves as an effective monitoring tool in the eating habits and body image landscape.

While surveillance data on school nutrition services are sparse, there are many ongoing programs and opportunities to improve coordination of efforts in this environment. They include efforts through the USDA Child Nutrition Programs administered through the Arizona Department of Education (ADE) Health and Nutrition Service (HNS) Division, the Farm to School efforts led by the Arizona Farm to School Network, school health education standards, and work at the Arizona Department of Health Services through SNAP-Ed (Arizona Health Zone- AZHZ) and the population health team.

Gaps in nutrition education and services are well defined in two ADHS reports: Bureau of Nutrition and Physical Activity FFY 2022 Goals and Objectives, and the AZ Health Zone Needs Assessment FFY 2020. It is also noteworthy to recognize the implications from the AZ Health Zone Needs Assessment, which point to multi-level interventions, community engagement, and trauma-informed approaches as overall strategies to shift behavior.

USDA Child Nutrition Programs

The administration of USDA Child Nutrition Programs (CNP) addresses opportunities for students to practice healthy eating and provide students exposure to a variety of nutritious foods available on campus. Additional opportunities to shape the nutrition environment exist through local wellness policy, and other nutrition education initiatives. Four USDA programs include National School Lunch Program (NSLP), School Breakfast Program (SBP), Afterschool Care Snack Program (ASCSP), and Summer Food Service Program (SFSP), all of which are administered by ADE HNS. Approximately 89% of Arizona schools (1,893 of 2,126) participate in Child Nutrition Programming, providing nutritious food to a significant number of Arizona students. Data on the number of students enrolled in programming is available and cited in the next paragraph, but specific information on gender, race, ethnicity, or economic status could not be obtained in time for this report. Additional data sets for these programs are accessible through ADE's data request process.

Prior to the pandemic, 638,068 students participated in CNP in 2017. Participation is estimated by average daily meals served. This constitutes almost half of the Arizona population enrolled in K–12 schools. There is a need to assess the gap between 89% of schools participating and only half of the student population participating. Consistent enrollment occurred until the pandemic hit, dropping the number of enrolled participants by 76.8% for a total of 154,450 students by 2021 (fig. 29). In response to the pandemic, federal legislation expanded participation requirements of School Lunch and Breakfast Programs to include everyone; eliminating the need for an application. For the 2022 school year, the

application process has been reinstated, which will provide critical information to assess impact of food security and related social determinants of health. Enrollment for 2022 was recorded at 635,052.

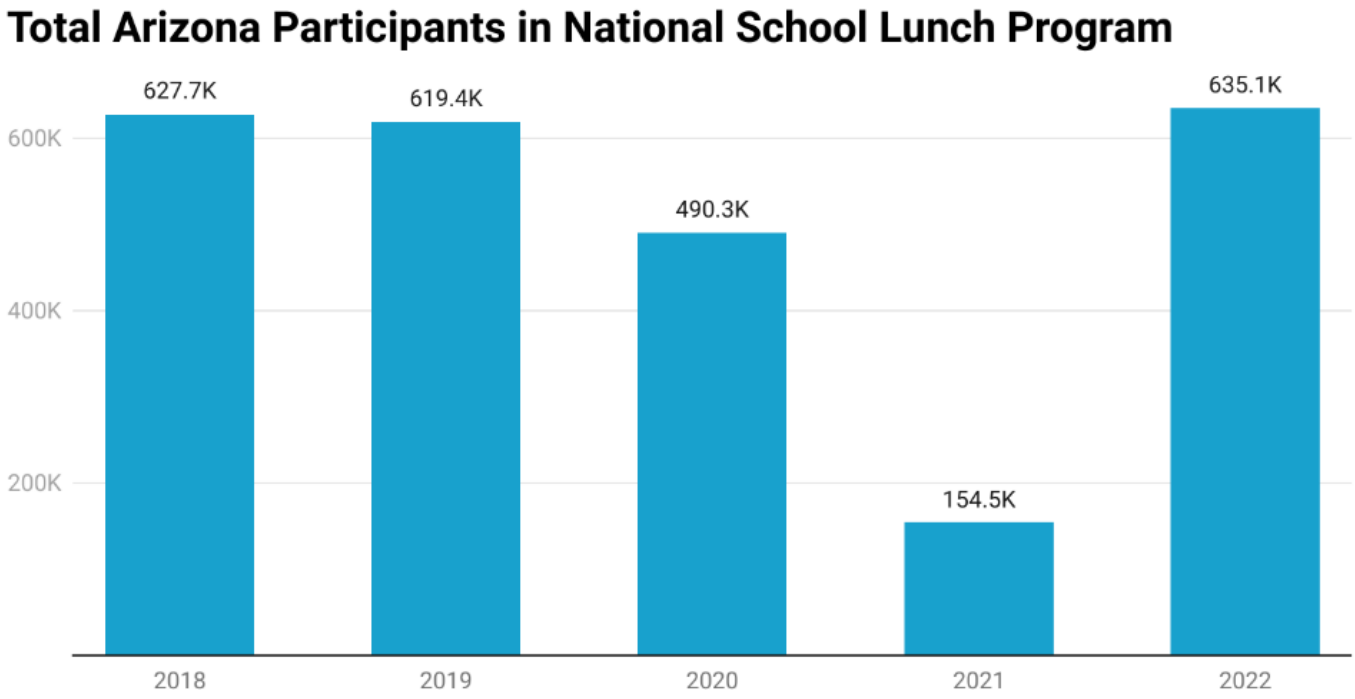

Figure 29

Food access and hunger cannot be addressed by working within schools alone. ADE coordinates the Arizona Farm to School Network, which uses a collective impact approach for systems change. The workgroups within the network engage with stakeholders regularly to address barriers, identify potential solutions for individual and collective communities, share best-practices, and elevate needs that require state-level attention. The work groups include Procurement, Food Education, School Gardens, and Farm to Table for Early Childhood Education and have identified the following topics as priority action areas: the need for distribution infrastructure for food producers like urban agriculture growers; training for farmers on how to sell produce to schools (quantities and specifications like prewashed, packaged); food sovereignty; and education on inclusive food systems.

SNAP-Ed and Arizona Health Zone programming

AZ Health Zone (AZHZ), the SNAP-Ed implementing agency, has garnered support from USDA to utilize trauma-informed approaches to nutrition education and community-centered interventions in districts and sites that meet the federal grant requirement of 50% or more of the students being eligible for free or

reduced-price meals. The work conducted in these settings is required to emphasize policy, systems, and environmental changes (PSE) strategies with a focus on community engagement, trauma-informed approaches, and health equity. The depth and breadth of the Program Guidance and Policy Manual provides detailed explanations for operators implementing the PSE framework and trauma-informed approaches when conducting nutrition education. The AZHZ acts as a convener for community based work, in approved sites and communities. This allows AZHZ to focus on depth of programming to ensure that changes are systematic and sustainable by being informed by those with lived experience in the community. The biggest limitation is that SNAP-Ed programming is limited to qualifying and approved sites.

AZHZ works on improving the school cafeteria environment through the use of Smarter Lunchrooms, which improves student eating behaviors and the number of reimbursable meals consumed through behavioral economics. There have also been efforts around Local Wellness Policy initiatives that resulted in enhanced school policies and the implementation of nutrition and physical activity programming, and strengthened school health policies through regular policy assessments. There are eligible sites that are not being served due to funding and staff capacity, as well as sites that are not eligible for SNAP-Ed. Nutrition education efforts are important regardless of SNAP-Ed eligibility. There is an opportunity for coordination among school health professionals to replicate the efforts of SNAP-Ed programs in sites that are not qualified or approved for SNAP-Ed assistance. The AZHZ structure is guided by federal legislation, which intentionally limits service provision to “Evidence-based Nutrition Education Interventions”. This limitation does allow for AZHZ to support LEAs who partner with qualifying districts and sites to improve nutrition and physical activity related policies, systems, and environmental changes.

The ADHS Bureau of Nutrition and Physical Activity (BNPA) Emerging Nutrition Initiatives team is well positioned, due to its diverse funding streams, to address additional nutrition and health concerns across the life span. Currently, the BNPA Emerging Nutrition Initiatives team includes an Adolescent Health Dietitian to address nutrition specific health concerns for the adolescent population. Programmatic opportunities include disordered eating awareness and prevention, nutrition education and messaging, as well as the intersection of body image, mental health, and suicide, and bullying prevention. However, this work will be most successful as part of the full school health landscape, which is the impetus for the publication of this report.

ADHS has several touchpoints with school health programming through the BNPA, Bureau of Women’s and Children’s Health (BWCH), and the Bureau of Tobacco and Chronic Disease Prevention. BNPA holds the AZHZ and the Population Health Team which each have distinct opportunities to engage with school health programming. In a brief scan of Policy Bridge, a data platform providing access to the policy manuals for publicly funded schools and districts in the state of Arizona, section JL “Student Wellness” contains guidance and language about health programming. The blanket policy for all districts emphasizes nutrition guidelines, nutrition education, and physical education. The implementation of this policy is not always assessed or supported with the exception of nutrition. LHDs may already be engaged in work that could fill gaps between student wellness policy as stated and their implementation.

Currently, nutrition services and education efforts in Arizona are robust, but somewhat disjointed, parsed between two state agencies and multiple teams within each agency. There are foundational committees

and workgroups in place that can support further alignment and enhance the nutrition services and education component of WSCC.

Physical Activity - HS / PEPA / SEC / PEnv / EW / FE / CI

The CDC recommends implementing a Comprehensive School Physical Activity Program (CSPAP) at all grade levels in K–12 education (fig. 30). There are five components to this model which include physical education as the keystone, before and after school activity, in-school activity, family and community engagement, and staff involvement. Each component is equally important to create more equitable opportunities and access to movement. The CDC strongly promotes the integration of the CSPAP model with fairly robust literature,[150] including research that suggests strong correlation between physical activity and academic achievement.[151]

Figure 30

Arizona mandates physical education (PE) for elementary and middle/junior high school, but according to SHAPE America, these mandates lack specificity. Standards-based physical education, taught by a certified PE teacher, results in improved learning outcomes and may lead to higher likelihood of activity later in life.[152] Current requirements allow for classroom teachers without certification to substitute games without instruction for the required PE time. Even though there are mandates, enrollment in PE is an additional issue. The Arizona Physical Education Data Project reports only 59% of students in K–12 settings in the state are enrolled in PE.[153] Enrollment varies by county between 26% in Gila to 76% in La Paz. Self-reporting of this data has led to inaccuracy in some districts, but overall, Arizona data show enrollment in PE is not affected by socio-economic status as demonstrated by free and reduced lunch enrollment. Better data collection for the Arizona Physical Education Project would support population health monitoring complementing CDC guidance on recommended physical activity guidelines. A recommended strategy includes leaning on internships from university public health programs to validate school reported physical education enrollment at sites in county jurisdictions. Local health department staff could be included in school communications to support and maintain LHD and LEA partnerships.

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[150] Centers for Disease Control and Prevention. (2011, September 16). School Health Guidelines to Promote Healthy Eating and Physical Activity.
[151] Kohl, H. W., S.), I. of M. (U., Cook, H. D., III, H. W. K., & Cook, H. D. (2013). *Educating the student body: Taking physical activity and physical education to school*. National Academies Press.
[152] Phillips, A. (2008). A Comparison of National Board Certified Teachers with Non-National Board Certified Teachers on Student Competency in High School Physical Education. *Physical Educator*, *65*(3).
[153] Arizona Department of Education. (2022). Arizona Physical Education Data Project. https://prod.artseddata.org/t/Arizona/views/AZPhysEd_PROD/Welcome?%3Adisplay_count=n&%3Aembed=y&%3AisGuestRedirectFromVizportal=y&%3Aorigin=viz_share_link&%3AshowAppBanner=false&%3AshowVizHome=n; https://prod.artseddata.org/t/Arizona/views/AZPhysEd_PROD/Welcome?%3Adisplay_count=n&%3Aembed=y&%3AisGuestRedirectFromVizportal=y&%3Aorigin=viz_share_link&%3AshowAppBanner=false&%3AshowVizHome=n.

CDC emphasizes the need for uniform ways to measure outcomes of activity, differentiated in novel methods.

Before and after school Physical Activity (PA) provides additional opportunities for students to be active in a way that promotes self-guided kinesthetic learning. Attendance Works, a non-profit that works to address attendance in schools at the national and local levels, assembled several studies suggesting schools that provided opportunities for after school PA programming have shown improved attendance and improved academic performance.[154] Understanding the layout of before and after school PA, like where it is offered, who has access, and how much time is available, would contribute to an Arizona-specific analysis of how PA can contribute to attendance. Little is currently known about this landscape but organizations like the YMCA and others support PA programming. The WSCC model graphically displays how the community supports the health of children by supporting PA. LEAs also provide support for before and after school PA. Of the 211 schools in Arizona that provide 21st Century programs, programming federally funded to support high-poverty and low-performing schools, roughly 60% of sites provide opportunities for after school PA, though the exact number of sites providing PA is not fully known. Some of these activities vary from school to school and include various team sports, karate, biking, and dance. Collaboration with ADE specific to the 21st Century Program could result in opportunities to collect the number of students enrolled in these activities, total time participating in activity, and potential longitudinal data on long-term results of participation related to lifetime activity participation. A more comprehensive understanding of before and after school physical activity in Arizona schools is needed and engaging existing partnerships may serve to augment data sets leading to improved understanding.

During school, PA includes recess, classroom activity breaks, PA integrated learning, and intramural activities. In 2018, Arizona passed the Recess Law (Senate Bill 1083), requiring all K–5 schools to provide 2 recess periods daily to students. At face value, this bill was a step forward for advancing health outcomes for K–5 students in Arizona, but several challenges prevent this law from being effective. The bill defines recess as “a period of time” without specificity as to how much time or when that time is to take place. As a consequence, before and after school activity, physical education, and very short (5 minutes or less) time periods meet the criteria, all of which is not developmentally adequate. A minimum of two, 15-minute “recesses” to take place between the first and last periods of instructional time during the school day (half days to include one period), would improve opportunities for physical activity during the school day. Additionally, there are no incentives or reporting requirements to meet the 2 periods required. Addendum to the law, time limits, and reporting requirements, must be coupled with financial and/or personnel support to implement and monitor effective recess strategies to reduce any associated burden on school staff. The CDC has resources available to support best practices in implementing recess, including coupling it with family and community engagement.[155]

There are two additional components from the CSPAP model that can contribute to positive physical activity outcomes for students, staff involvement and family and community engagement. There are

[154] *Making the Case: How Good Afterschool Programs Improve School-day Attendance*. Attendance Works. (n.d.). Retrieved May 10, 2022, from https://www.attendanceworks.org/wp-content/uploads/2017/08/Afterschool9.20.pdf
[155] *Strategies for recess in schools*. (n.d.). Retrieved August 4, 2022, from https://www.cdc.gov/healthyschools/physicalactivity/pdf/2019_04_25_SchoolRecess_strategies_508tagged.pdf

currently several strategies being used by schools in Arizona that support these components: Joint-Use Agreements (JUA), before and after school programming, and community events. JUAs can be formal or informal, and allow for school property to be used by families and the community for a variety of activities. In a 2015 Health Impact report from Maricopa County, a heat map of Roosevelt Unified School District was overlaid with parks and schools hosting JUAs.[156] Though this mapping is one way to assess access to facilities, which may reduce barriers to physical activity, actual use of school facilities may not be represented by formal agreements and more research is needed to assess increased activity levels as a direct association with JUA implementation.[157] Capturing information on community events and after school programming can also pose challenges. Annual and quarterly reports to ADHS programs from LHDs may include schools in Arizona reporting activities including “Family Fitness Nights” and “fun runs” to supplement CSPAP implementation. A more comprehensive understanding of the benefits, barriers, and measurements of implementation would allow ADHS to contribute to a body of literature specific to these CSPAP components, promoting more participation in these types of activities at school sites. One study from 197 6th grade students found increased levels of PA in girls participating in programming.[158] Programming included teacher-led activities and take-home family activities, which contributed to evaluation of staff involvement and family and community engagement in CSPAP components. ADHS has a significant opportunity to contribute to literature that connects the dots to PA and academics by examining state implementation.

Local health departments have opportunities to collaborate with districts in CSPAP implementation through training and technical assistance (TTA); collaborative grant work; evaluation of programming; or assisting with staff, family, and community involvement.[159] [160] TTA focused on CDC aligned policy guidance that promotes opportunities for physical activity at the school site can be led by LHDs funded by USDA and 1801 grant activities. Policy and systems level TTA can specifically address some of the following concepts: provision of certified physical education including frequency of instruction, JUAs, implementation of recess programming, community partnership to increase opportunities for PA, community design strategies, as well as family and community engagement strategies.[161] The integration of neighborhood and built environment as a social determinant of health has particular strategic value as a focal point. There is a need to understand the current level of knowledge among LHD staff to link

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[156]Report 2015 shared-use - livableaz.org. (n.d.). Retrieved July 15, 2022, from http://livableaz.org/wp-content/uploads/2019/12/Maricopa-County-2015-SharedUse-Roosevelt-HIA-final-report.pdf

[157] Omura JD, Carlson SA, Paul P, Sliwa S, Onufrak SJ, Fulton JE. *Shared use agreements between municipalities and public schools in the United States*, 2014. Prev Med. 2017 Feb;95 Suppl:S53-S59. doi: 10.1016/j.ypmed.2016.09.026. Epub 2016 Sep 20. PMID: 27658899; PMCID: PMC5312732.

[158] Barr-Anderson, D. J., Laska, M. N., Veblen-Mortenson, S., Farbakhsh, K., Dudovitz, B.& Story, M. (2012). A school based, peer leadership physical activity intervention for 6th Graders: Feasibility and Results of a Pilot Study. Journal of Physical Activity & Health, 9(4), 492–499

[159]Caldwell, H. A. T., Di Cristofaro, N. A., Cairney, J., Bray, S. R., MacDonald, M. J., & Timmons, B. W. (2020). Physical Literacy, physical activity, and health indicators in school-Age children. *International Journal of Environmental Research and Public Health*, *17*(15), 5367. https://doi.org/10.3390/ijerph17155367

[160] Centers for Disease Control and Prevention. (2021, November 16). *Program evaluation home - CDC*. Centers for Disease Control and Prevention. Retrieved April 1, 2022, from https://www.cdc.gov/evaluation/

[161] Botchwey, N. D., Hobson, S. E., Dannenberg, A. L., Mumford, K. G., Contant, C. K., McMillan, T. E., Jackson, R. J., Lopez, R., & Winkle, C. (2009). A model curriculum for a course on the built environment and public health. *American Journal of Preventive Medicine*, *36*(2). https://doi.org/10.1016/j.amepre.2008.10.003

appropriate professional development addressing neighborhood and built environment. Deployment of a survey as a pre-assessment of content knowledge is an action item worthy of pursuing.

From the context of COVID-19 recovery, physical activity and certified physical education have a high level of importance. Though occurrence of long COVID or post-COVID conditions (PCC) in children can be rare, cases affecting cardiological and respiratory function have been documented, and there is no single treatment. Children with PCCs may need physical therapy with appropriate levels of conditioning before participating in activity. Studies cite the decrease in physical activity among children during the pandemic as a public health issue with many consequences, including higher risk for poor mental health and chronic health conditions.[162] [163] [164] In 2019, 24% of U.S. children and youth ages 6 to 17 met the guideline of 60 minutes of physical activity every day. [165] The survey also points out that the U.S. has also seen "...a significant drop in physical activity levels with increasing age: 42.5%, 7.5% and 5.1% of 6 to 11 year olds, 12 to 15 year olds and 16 to 19 year olds meet physical activity guidelines." The COVID-19 pandemic has prevented robust data collection addressing lack of opportunities for physical activity among school-aged children, but many researchers cite children growing up in poverty and minority children as having less access than their peers. This will continue to widen the health inequity gap. Furthermore, findings on the association between physical inactivity and severe COVID-19 outcomes are correlational, demanding further study as PCC emerges as a public health issue.[166] ADHS can work to collect information from parents and guardians about the amount of activity their children were able to participate in during the pandemic in order to learn more about the connections between lack of physical activity and PCC. Physical activity in schools is a leading strategy for Arizona's recovery from COVID-19 and collaboration with local health departments can make implementation of PA more effective through policy and TTA based on the CSPAP model.

Conclusion

Public education and public health collaboration promotes health and wellness for all Arizonans. Forward thinking practices that support organizational alignment include: schools as integrated health centers, asset-based approaches to instruction, personalized learning and "Next Education Workforce", which all address education access and quality as a social determinant of health. These strategies promote access to care and health equity, each warranting further exploration and research. The potential of integrated health centers at school sites has been realized in some Arizona school districts including

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[162] Khan, A. H., Sultana, M. S., Hossain, S., Hasan, M. T., Ahmed, H. U., & Sikder, T. (2020). The impact of COVID-19 pandemic on Mental Health & wellbeing among home-quarantined Bangladeshi students: A cross-sectional pilot study. *Journal of Affective Disorders*, *227*, 121–128. https://doi.org/10.31234/osf.io/97s5r

[163] Maugeri, G., Castrogiovanni, P., Battaglia, G., Pippi, R., D'Agata, V., Palma, A., Di Rosa, M., & Misumeci, G. (2020). The impact of physical activity on psychological health during COVID-19 pandemic in Italy. *Heliyon*, *6*(6).

[164] Dunton, G., Wang, S., Do, B., & Courtney, J. (2020). Early effects of the COVID-19 pandemic on physical activity locations and behaviors in adults living in the U.S.: Differences by ethnicity and income. *Cambridge Open Engage*. https://doi.org/10.33774/coe-2020-kx2rq-v2

[165] Merlo CL, Jones SE, Michael SL, et al. *Dietary and Physical Activity Behaviors Among High School Students* — Youth Risk Behavior Survey, United States, 2019. MMWR Suppl 2020;69(Suppl-1):64–76.

[166] *Brief summary of findings on the association between physical ...* (n.d.). Retrieved December 19, 2022, from https://www.cdc.gov/coronavirus/2019-ncov/downloads/clinical-care/E-Physical-Inactivity-Review.pdf

Avondale, Nogales, and Ajo. Studies on school-based health centers (SBHC) based in areas with higher poverty rates have a positive effect on health, attendance, and academic performance of students where SBHCs are located, as well as reduction in hospitalization.[167] Health department support for asset-based approaches to instruction, personalized learning, and “Next Education Workforce" can occur by highlighting the research supporting the health benefits connected to these initiatives. When the voice of public health is used to bring attention to the connection between quality education and health, there is a positive shift in the narrative about how education benefits the community, which can enhance the health of all Arizonans.

There is great potential for impactful collaboration between public health and public education. The pandemic provided incentive for public health and many LEAs to start navigating these partnerships, enabling them to garner support for their students, teachers, and greater communities in novel ways. The timing has never been better to reimagine child health and strengthen partnerships.

[167] Arenson M, Hudson PJ, Lee N, Lai B. The Evidence on School-Based Health Centers: A Review. Glob Pediatr Health. 2019 Feb 19;6:2333794X19828745. doi: 10.1177/2333794X19828745. PMID: 30815514; PMCID: PMC6381423.

Appendix I

Opportunities for data collection, policy, and programming have been outlined throughout this needs assessment. Knowing that educational attainment is a key predictor of health outcomes, supporting funding for Arizona's public education system is an important component of supporting population health.[168] Educational funding has been tied to improved educational outcomes for individuals living in poverty in several states.[169] [170] [171] [172] The following table includes a summary of gaps and needs identified through this assessment.

Existing Data and Data Gaps

Motor Vehicle Safety	ADOT outlines collision and fatality data; gaps exist in law enforcement data outlining specified motor vehicle safety trends specific to adolescents; additional gaps exist related to qualitative data about driving behaviors that can augment AYS/YRBS data.
Sexual and Reproductive Health (SRH)	LEAs report credit hours and curriculum requisites for classes that meet AZ standards; gaps exist in data reflecting efficacy of SRH content for marginalized communities.
Teen Pregnancy	TPP partners collect and share data pertaining to this issue; data gaps exist for populations who don't have access to care.
Sexually Transmitted Infections	Data from STI rates in youth provide some insight into transmission rates through disease reporting; information on behaviors and perceptions of sexual activity may be obtained by AYS/YRBS; limitations on race/ethnicity data exist because ADHS relies only on provider reported data and youth may not be supported in service provision due to stigma and other associated barriers.

[168] Raghupathi, V., & Raghupathi, W. (2020). The influence of education on health: An empirical assessment of OECD countries for the period 1995–2015. *Archives of Public Health*, *78*(1). https://doi.org/10.1186/s13690-020-00402-5

[169]Kreisman, D., & Steinberg, M. P. (2019). The effect of increased funding on student achievement: Evidence from Texas's Small District Adjustment. *Journal of Public Economics*, *176*, 118–141. https://doi.org/10.1016/j.jpubeco.2019.04.003

[170] Baron, E. J. (2019). School spending and student outcomes: Evidence from revenue limit elections in Wisconsin. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3430766

[171] Rauscher, E. (2019). Delayed benefits: Effects of california school district bond elections on achievement by Socioeconomic Status. *Sociology of Education*, *93*(2), 110–131. https://doi.org/10.1177/0038040719892577

[172]Abott, C., Kogan, V., Lavertu, S., & Peskowitz, Z. (2020). School District operational spending and student outcomes: Evidence from tax elections in seven states. *Journal of Public Economics*, *183*, 104–142. https://doi.org/10.1016/j.jpubeco.2020.104142

Child and Adolescent Exposure to Pornography	No Arizona specific data exists in this area.
Nicotine and Tobacco	YRBS is showing a decrease in cigarette use and an increase in use of vape devices and e-cigarettes among the adolescent population in Arizona. Data evaluating trends in vapor products are fairly new.
Opioids	Current data show that opioid use in adolescent populations is increasing as seen through the HDD in the number of adolescent opioid poisonings occuring. AYS and YRBS are under-utilized in the state and therefore cannot be validated prohibiting the validity of the limited data we have about opioid use in adolescents. There is a need for better understanding of certain aspects of adolescent opioid use such as procurement method, frequency, type, etc.
Alcohol	Use and attitudes measured in YRBS/AYS; Gaps exist in disciplinary referral data from schools; geographic mapping of the density/availability overlaid with use trends.
Marijuana	Dispensary data including the locations of dispensaries and number of sales: YRBS/AYS; need disciplinary data access from school systems on student use; Data connecting availability and access from geographical perspective.
Mental and Behavioral Health	Data pertaining to *school referrals* to behavioral or mental health service provision are inconsistent; there is no consistency to the format for *in-school BH service provision*; need for AHCCCS data pertaining to services.
Bullying and Violence	AYS/YRBS data about trends; (other bullying data); more detailed information connecting disproportionately affected populations including CYSHCN and LGBTQIA2S+ and their experience with bullying is needed; the “School Crime Supplement” to the National Crime Victimization Survey reports declining trends nationally, more detailed analysis about the effects of COVID-19 on these statistics is needed.
School Health Services	ADE employee records reported to the agency from LEAs detailing staff assignments, though this information is inconsistent. Refining these data and supporting easier access re: staffing would define where the gaps exist; ASAP information on nurse deployment and PD contributes to the defined need for health service gaps; inconsistent definition of LEA administrative description/understanding of “school nurse” contributes to gaps in service provision.
Immunizations	Decrease in routine vaccinations in Arizona demonstrated by Arizona State Immunization Information System (ASIIS) and Immunization Data Report (IDR); The CDC reports that all types of routine vaccines across all age groups in children and adolescents experienced decreased administration after stay-at-home orders were lifted. Exact rates of decreases in routine childhood and adolescent immunizations in Arizona are not currently known. There is a need to improve these trends to stay on track with historic

	improvements vaccines have made.
Oral Health	LHDs report mobile oral health service provision to ADHS; no uniform data system to collect information on overall population oral health as it pertains to school-age children in Arizona currently exists.
Vision and Hearing	The number of hearing screenings conducted in the most recent school year has decreased 35% since the reported numbers prior to the COVID-19 pandemic. Identification of where these decreases have occurred is needed to ensure the mandatory screenings take place and students do not slip through the cracks.
Stock Medications	There is a need for data on the training on stock medications that takes place for school health staff; needs for uniform collection on data on the distribution of medications in schools and fidelity to a defined process that yields accurate reporting of administration of stock medications is also needed.
Children and Youth with Special Health Care Needs	Data reporting the number of CYSHCN in Arizona are not clear, resulting in estimates of the total number of this population and an incomplete picture of specific SHCN represented in this population; research outlines disproportionate effects of a range of public health issues, but a more comprehensive understanding is needed.
Concussions	HDD provides some insights into head trauma experienced by youth, data tracking the effects post concussion is inconsistent due to the broad range of effects experienced by concussion-affected youth; more data are needed to assess the severity of consequences for youth who experience multiple concussions and the factors that contribute to these experiences.
Nutrition Services	Data on NSLP and subsidiaries of this program are available from ADE; data reflecting the effect of nutrition services programming on the long-term health behaviors related to food consumption are needed.
Physical Activity	Data are available from ADE tracking physical education, though more accurate reporting is needed; a need for consistent data on the implementation of the “Recess Bill”, reporting the amount of time allocated for recess; AYS/YRBS provide data on self-reported PA.

Data Sources

U.S. Census

Every 10 years, the United States gathers legally mandated data in the form of the U.S. Census. This survey gathers information about demographics, housing, and socio-economic status of the population. The United States Census Bureau administers the survey and uses the information to publish a variety of reports that are used for developing economic, government, and other sector tools. Public health uses the census to inform an array of actions and evaluations.

Youth Risk Behavior Surveillance System (YRBSS) *also referred to as YRBS*

YRBSS is a system of surveys. It includes 1) a national school-based survey conducted by CDC and state, territorial, tribal,health departments or organizations and 2) local surveys conducted by state, territorial, and local education and health agencies and tribal governments. CDC uses these surveys to monitor trends in 6 categories of health behaviors in 9th, 10th and 12th grade students. This survey is administered during the spring on odd numbered years. Data is typically released around the fall of the following year, with reports detailing findings released in June of the next year.

Arizona Youth Survey (AYS)

“The Arizona Youth Survey (AYS) is administered every two years to a statewide sample of 8th, 10th, and 12th grade youth under the direction of the Arizona Criminal Justice Commission Statistical Analysis Center and in partnership with the Arizona State University School of Criminology & Criminal Justice. Based on the nationally recognized Risk and Protective Factor model and the Communities That Care survey (Hawkins et al., 1992), the AYS assesses the prevalence and frequency of youth substance use, gang involvement, and other risky behaviors, and helps stakeholders to better understand the risk and protective factors that are correlated with these behaviors.” - AZ Criminal Justice Commission

Child Fatality Review Program

The Arizona Child Fatality Review Program (CFRP) was established to review all possible factors surrounding a child’s death. The program intends to identify ways of reducing preventable fatalities. Legislation was passed in 1993 (A.R.S. § 36-342, 36- 3501) authorizing the creation of the CFRP. In 1994, the review process and data collection began. Today, 10 local teams conduct initial reviews with oversight from the State Team and its two committees. Many communities across Arizona have used report findings and recommendations to educate the public on ways to improve the safety and health of children and have supported changes in policy and legislation to reduce childhood deaths. The Child Fatality Review State Team's annually published report outlines actions that each of us can take to prevent the untimely deaths of Arizona's children.

The National Survey for Children's Health

This survey, funded and directed by the Health Resources and Services Administration (HRSA) Maternal and Child Health Bureau (MCHB), provides information about children’s physical and mental health, access to quality health care, and the child’s family, neighborhood, school, and social context.

Healthy Bodies Healthy Smiles

The Healthy Bodies Healthy Smiles survey was conducted by the Arizona Department of Health Services and First Things First during the 2014–2015 school year. This survey screened kindergarten and third grade students in Arizona from non-reservation public and charter schools with a sampling frame stratified by county and percent of student population eligible for the national school lunch program. Of the 104 schools selected, 84 schools agreed to participate. Dental professionals completed oral health screenings at each school to detect each of the following: presence of untreated tooth decay in both primary and/or permanent teeth, presence of treated tooth decay in both primary and/or permanent teeth, urgency of need for dental care, presence of dental sealants (third grade only).

Hospital Discharge Data (HDD)

ADHS collects hospital discharge records for inpatient and emergency department visits from all Arizona licensed hospitals. HDD allows insight into the causes of mortality and morbidity that result in hospital visitation. Severe accidents and injuries will almost always result in hospitalization, allowing for the capture of this valuable data set. Demographic information, location of admission and other information is often captured within this data set. Data are reported every 6 months and finalized year data are usually available in May of the following year.

School Health Profiles

Biennial administration of this survey assesses school health policies and practices in states, large urban school districts, and territories. The surveys are completed by school personnel in middle and high schools and administered by education and health agencies.

Appendix II

Where the WSCC Model Fits…

Health Education - HE ● Motor Vehicle Safety ● Sexual and Reproductive Health ● Teen Pregnancy ● Substance Use ● Nicotine and Tobacco ● Mental and Behavioral Health ● Bullying and Violence ● Screen Time and Internet Safety ● Physical Activity	**Social & Emotional Climate - SEC** ● Sexual and Reproductive Health ● Teen Pregnancy ● Substance Use ● Nicotine and Tobacco ● Mental and Behavioral Health ● Bullying and Violence ● Screen Time and Internet Safety ● School Health Services ● Children with Special Healthcare Needs ● Nutrition Services and Environment ● Physical Activity
Physical Education & Physical Activity - PEPA ● Mental and Behavioral Health ● Physical Activity	**Physical Environment - PEnv** ● Motor Vehicle Safety ● Substance Use ● Nicotine and Tobacco ● Children with Special Healthcare Needs ● Nutrition Services and Environment ● Physical Activity
Nutrition Environment & Services - NES ● Nutrition Services and Environment ● Physical Activity	**Employee Wellness - EW** ● Nicotine and Tobacco ● Mental and Behavioral Health ● Screen Time and Internet Safety ● Physical Activity ● Immunizations ● Health services ● Nutrition Services and Environment
Health Services - HS ● Substance Use ● Nicotine and Tobacco ● Mental and Behavioral Health ● School Health Services ● Immunizations ● Oral Health ● Sensory Screenings ● Stock Medications ● Children with Special Healthcare Needs ● Concussions ● Nutrition Services and Environment	**Family Engagement - FE** ● Teen Pregnancy ● Substance Use ● Nicotine and Tobacco ● Mental and Behavioral Health ● Bullying and Violence ● Screen Time and Internet Safety ● School Health Services ● Immunizations ● Oral Health ● Sensory Screenings ● Children with Special Healthcare Needs ● Physical Activity

Counseling Psychological & Social Services - CPSS	**Community Involvement - CI**
● Sexual and Reproductive Health ● Teen Pregnancy ● Substance Use ● Nicotine and Tobacco ● Mental and Behavioral Health ● Bullying and Violence ● School Health Services ● Children with Special Healthcare Needs ● Concussions	● Teen Pregnancy ● Substance Use ● Nicotine and Tobacco ● Mental and Behavioral Health ● Bullying and Violence ● Screen Time and Internet Safety ● School Health Services ● Immunizations ● Oral Health ● Sensory Screenings ● Children with Special Healthcare Needs ● Physical Activity ● Resilience ● School Safety ● Substance Use

Appendix III

Glossary of Key Terms

- **Adolescents**- 10–19 year olds
- **Adolescent Reproductive Health**- physical, mental, and social well being in all matters pertaining to the reproductive system of youth between the ages of 10 and 19
- **Adolescent Sexual Health**- includes topics such as self-esteem, sexual assault/coercion, learning to navigate risk taking, sexually transmitted infections (STIs), contraception, teen pregnancy, and more
- **Adverse Childhood Experiences**- negative experiences in childhood that cause increased risk for negative outcomes in adulthood
- **Centers for Disease Control and Prevention (CDC)**- National public health agency of the United States
- **Children**- 5–10 year olds
- **Children and Youth with Special Health Care Needs (CYSHCN)**- CYSHCN are children who have or are at increased risk for chronic physical, developmental, behavioral, or emotional conditions. They also require health and related services of a type or amount beyond that required by children generally. (HRSA definition)
- **Graduated Instruction Permit/Graduated Drivers License (GDL)**- Instruction permit allowed to individuals who are at least 15 years and 6 months of age who must be accompanied by a licensed driver at all times who is at least 21 years of age. License allowed to individuals between the ages of 16 and 18 that is valid to operate any vehicle that does not require a commercial or motorcycle endorsement (ADOT)
- **LGBTQIA2S+**- Lesbian, Gay, Bisexual, Transexual, Questioning, Intersex, Asexual, Two-Spirit, other sexual orientations
- **Local Education Agency (LEA)**- School district, charter holder, or education service agency (AZ SB 1306)
- **Opioids**- Highly addictive class of drugs used to reduce pain including prescription drugs, heroin, and synthetic opioids such as Fentanyl (CDC)
- **Protective Factors**- characteristics associated with a lower likelihood of negative outcomes or that reduce a risk factor's impact. Protective factors may be seen as positive countering events
- **Risk Factors**- characteristics at the biological, psychological, family, community, or cultural level that precede and are associated with a higher likelihood of negative outcomes
- **Recess Bill** - On April 4, 2018, Senate Bill 1083 was signed into law. The law requires all schools that have grades K–5 provide two recess periods per school day. Per the law, recess is defined as "a period of time during the regular school day, including time before or after a scheduled lunch period, during which a pupil is able to engage in physical activity or social interaction with other pupils". (ADE)
- **School-Aged Children**- 5–19 year olds
- **Sexually Transmitted Infection (STI)**- Infections and/or diseases that transmit from one person to another through vaginal, oral, and anal sex (CDC)

- **Social Determinants of Health (SDOH)**- are the nonmedical factors that influence health outcomes. They are the conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life. These forces and systems include economic policies and systems, development agendas, social norms, social policies, racism, climate change, and political systems.
- **Socio-Economic Factors**- Components of an individual's life that contribute to their socioeconomic status including education, income, occupation, etc.
- **Social-Ecological Model**- A four-level model used to consider the complex interplay between individual, relationship, community, and societal factors that may affect an individual
- **Systematically Disadvantaged Populations**- Groups of individuals in which the social conditions they were born and live and age in do not ensure opportunities for them to be healthy and flourish (University of Pennsylvania)
- **Whole School, Whole Community, Whole Child (WSCC)**- The Centers for Disease Control and Prevention's model for addressing health in schools. The model is student centered, supported by the community, and includes ten components to address a robust picture of health.