ARIZONA
DEPARTMENT OF
HEALTH SERVICES

ARIZONA DEPARTMENT OF HEALTH SERVICES (ADHS)

ASTHMA BURDEN REPORT

JUNE 2025

FINAL

ADHS Asthma Burden Report

June 2025

Acknowledgments/Contributors:

Reducing the burden of asthma in Arizona requires ongoing collaboration among public health professionals, community partners, and dedicated stakeholders. The recommendations outlined in this report aim to improve the lives of individuals and families affected by this chronic condition across the state.

The Arizona Department of Health Services (ADHS) would like to express its deep appreciation to all partners, collaborators and stakeholders who played an essential role in the development of this report. Their contributions have been invaluable to this project. We appreciate the contributions of the Arizona Department of Environmental Quality (ADEQ), the Arizona Hospital Discharge Data (HDD) team, The Office of Tobacco Prevention and Cessation, County Health departments, American Association (ALA) and other stakeholders for their support with secondary data collection efforts. Lastly, we thank the Arizona Asthma Coalition, Asthma Stakeholder Workgroup, and other engaged partners for their participation and insightful feedback during the stakeholder engagement process. We appreciate the ongoing commitment and partnership addressing asthma and promoting healthier futures for all Arizonans. We acknowledge the efforts of the ADHS review team, including staff from the Bureau of Chronic Disease and Health Promotion & Bureau of Assessment and Evaluation, for their collaboration, feedback, and support throughout the report's development.

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About LeCroy & Milligan Associates:

Founded in 1991, LeCroy & Milligan Associates, Inc. is a consulting firm specializing in social services and education program evaluation and training that is comprehensive, research-driven, and useful. Our goal is to provide effective program evaluation and training that enables stakeholders to document outcomes, provide accountability, and engage in continuous program improvement. The evaluation team includes Yvonne Bueno, DrPH, MPH, Mireilys Ramirez Caraballo, MPA, Michelle Schmidt, MPA, Tiffany Sais, MSW, and Julia Garcia, MSW, Bella Santa Cruz, and Katie Sellman.

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Report Contents

List of Exhibits

EXECUTIVE SUMMARY

The Arizona Department of Health Services (ADHS), Bureau of Chronic Disease and Health Promotion, contracted with LeCroy & Milligan Associates, Inc., to develop an Asthma Burden Report, designed to inform ongoing efforts to address asthma as a chronic health issue in Arizona. The report was based on available secondary data from state and national surveillance systems and local partners, ADHS-relevant reports such as the Respiratory Burden Report and School Health Needs Assessment. Other supporting sources included the previous Asthma Burden Report and the AZ School Nurse Survey. Asthma continues to be a significant chronic health condition in Arizona, affecting both children and adults across the state. ADHS last published an Asthma Burden Report in 2016 (American Lung Association, 2016), which identified over 615,000 Arizonans living with asthma and disparities by age, gender, and race/ethnicity. The ALA estimated that number to be 730,262 in 2023[1]. It emphasized the need for asthma action plans, home-based interventions, and improvements in care coordination. This report expands upon the 2016 Asthma Burden Report findings and recommendations.

The 2025 report presents an updated and comprehensive analysis of the asthma burden in Arizona. Specifically, this report presents data and insights related to asthma surveillance in children and adults; the geographic distribution of asthma; economic factors related to asthma management; healthcare utilization; environmental factors, such as air quality and pollution; home and school-related factors; and asthma-related health policies. The findings from this report will also serve as a foundation for future asthma action planning and grant funding requests for ADHS, the Arizona State Asthma Coalition members, and other partners. High-level results of the secondary data collection and analysis are summarized below.

Summary of Asthma Burden in Arizona

Asthma Prevalence

- Adult current asthma prevalence was higher than the national average during 2018 (10.0% AZ vs 9.2% US), 2019 (9.7% AZ vs 9.0% US), and 2020 (9.6% AZ vs 9.2% US), then fell below the national average in 2021 (9.4% AZ vs 9.7% US) and 2022 (9.7% AZ vs 9.9% US)..
- Arizona's 2022 current adult asthma prevalence rate of 9.7% reflects relative stability over time when compared to the 2016 Asthma Burden Report, which stated a 9.6% current adult prevalence (2014 data).
- From 2017 to 2021, Arizona adults consistently reported higher lifetime asthma prevalence at 15.2% than the national average of 14.3%.

[1] Current Asthma by State, 2023 | American Lung Association

Summary of Asthma Burden in Arizona	
	• Child current asthma prevalence declined from 8.9% (2016–2017) to 6.6% (2020–2021), then rose again to 8.7% in 2022–2023. This suggests a return to earlier levels and no major improvement since the last report.
 Demographics	• AZ adult females showed higher prevalence than adult males. AZ black non-Hispanic adults had higher asthma prevalence compared to the national average. • AZ young adults aged 18–24 showed higher prevalence in 2021(14%) compared to US (10.9%) in 2021. • Highest prevalence in children were those ages 12–17 with 15.6% of asthma diagnosis in 2023. The 0–4 age group had the lowest asthma rates. • AZ Youth Risk Behavior Surveillance System (grades 9–12) showed higher self-reported asthma prevalence (25.2%) than national average (21.8%), and highest self-reported rates among males, 10th graders, and Hispanic/Latino students. • Black non-Hispanic children had the highest prevalence across all racial groups in 2019 (13.5%) and 2020 (8.9%), while Hispanic and Mexican American children reported lower rates (5.0%).
 Geographic	• AZ asthma prevalence (2019-2022) was 9.8% overall, slightly below the national average of 10.6%. County prevalence ranged from 8.6% to 10.4%. • Counties with the lowest rates: Gila, Graham, Navajo, and Santa Cruz. • Counties with the highest rates: Coconino, Mohave, Yavapai, Yuma, Cochise, and Pima.
 Economic	• People with uncontrolled asthma pay higher costs for acute care. • People with controlled asthma pay higher costs for medications but lower costs for acute care. • The total cost of asthma in AZ is projected to rise from $2.2 billion in 2025 to $2.5 billion by 2030. Per-person annual cost is estimated to rise from $5,200 to nearly $5,900 from 2025 to 2030. • AZ has higher asthma mortality rates than the national average, with spikes in 2016 and 2020. There were 89 asthma related deaths in Arizona in 2021.

Summary of Asthma Burden in Arizona

Healthcare

- Females and children 0-17 had highest emergency department (ED) asthma related discharge rates.
- Inpatient (IP) discharges for asthma have declined overall since 2014.
- Emergency Department and Inpatient discharges for asthma declined during COVID-19 and began increasing again in 2023.
- County-level disparities, especially in rural and tribal regions such as Apache, Gila, Cochise, and Mohave, which had the highest ED and IP rates per100,00 population.
- Larger counties, like Maricopa and Pima, had lower proportions of the population affected, despite having the greatest total discharges.
- Counties with small populations (e.g., Greenlee, La Paz, Santa Cruz) suppressed data due to low discharge counts, limiting analysis.

Community

- AZ has met more than half of the Asthma and Allergy Foundation of America core policy standards.
- AZ has implemented the Stock Inhaler for Schools Program in 836 schools. A pilot in Tucson schools reduced asthma-related 9-1-1 calls by 20% and EMS transport by 40%.
- Children exposed to secondhand smoke (SHS) face an increased risk of frequent and severe asthma episodes.
- Adults regularly exposed to SHS face a 20%–30% higher risk of developing lung cancer.

Environmental

- Arizona Department of Environmental Quality's (ADEQ) air quality monitoring and forecast data is essential to identify asthma triggers such as ozone and particulate matter.
- The ALA State of the Air report, using Environmental Protection Agency (EPA) standards assigned Arizona a grade "F" for ozone pollution in Maricopa, Gila, Pinal and Pima counties and an "F" in for particulate pollution in Maricopa and Pinal counties.
- Although adult smoking rates are declining, youth use of electronic vaping products (EVPs) is rising (17.2% in 2021), with 1 in 2 teens using EVPs attempts to quit.
- Female youths reported higher EVP use than males (21.1% vs. 13.3%). White high school youth (20.5%) were significantly more likely than Black high school youth (7.6%) to report current EVP use in 2021.
- The AZ Tobacco Control Program's (ATCP) strategic plan aims to prevent tobacco-related diseases, including asthma, by reducing smoking rates and exposure to Secondhand Smoke.

Summary of Asthma Burden in Arizona	
 Policy	• Arizona leverages both federal and state policies to reduce asthma burden. Key policies include the Clean Air Act, Affordable Care Act, Smoke-Free Arizona Act, and the Stock Inhaler for Schools Program, which collectively aim to reduce exposure, improve access to care, and support disease management.

Key Recommendations

This report presents recommendations developed in collaboration with asthma stakeholders across Arizona. These partner-informed strategies align with the Centers for Disease Control and Prevention (CDC) National Asthma Control Program's (NACP) EXHALE Strategies and reflect shared priorities identified through community engagement. Key areas of focus include culturally responsive asthma education, stronger enforcement of smoke-free policies, expanded in-home asthma support, support for asthma-friendly practices in schools, and enhanced environmental protections in high-burden communities. These recommendations are intended to inform cross-sector action, reduce disparities, and improve long-term asthma outcomes across the state. In addition, this report supports broader national goals, aligning with the Healthy People 2030 objectives related to respiratory health. A more comprehensive list is provided in the Summary and Recommendations section of this report.

Summary of Key Recommendations by the CDC's six EXHALE Strategies and Healthy People 2030

EXHALE Strategy	Key Recommendations (with priority themes)	HP2030 Alignment
E – Education on Asthma Self-Management	• Promote accessible, culturally responsive asthma education in schools, clinics, and communities across Arizona (e.g., age-appropriate programs targeting youth, females, Black, and multiracial populations). • Strengthen school staff training on asthma response protocols, especially in areas lacking school nurses. • Standardize the use of asthma action plans across school districts and integrate into	RD-04 – Reduce asthma attacks RD-02 – Reduce ED visits for children under 5 RD-D01 – Reduce hospitalizations in children Reduce asthma attacks

EXHALE Strategy	Key Recommendations (with priority themes)	HP2030 Alignment
	students' health records maintained by school nurses or designated health staff. • Strengthen youth-focused tobacco prevention efforts by addressing vaping specifically and aligning messaging with existing peer-led asthma education initiatives. Leverage and expand the Arizona Tobacco Control Program efforts.	RD-04- Reduce ED visits for people aged 5 years and over with asthma RD-03- Reduce hospitalizations for asthma in people aged 5-64 years RD-D02- Reduce ED visits for children under 5 with asthma
X – X-tinguishing Smoking and Secondhand Smoke	• Leverage Arizona Tobacco Control Program (ATCP) for cessation support. • Promote voluntary and enforceable smoke-free housing policies.	RD-01 – Reduce asthma deaths RD-04 – Reduce asthma attacks RD-02 – Reduce ED visits for children under 5
H – Home Visits for Trigger Reduction	• Expand home visit pilots/screenings to address asthma triggers especially for rural/tribal areas. Prioritize "low-hanging fruit" for home-based interventions to prevent ED visits. • Explore Medicaid reimbursement for CHW-led asthma education. Explore successful program intervention identified by the Regional Asthma Management & Prevention (RAMP).	RD-D01 – Reduce asthma hospitalizations (children) RD-D02 – (ages 5–64) RD-02 – Reduce ED visits in young children
A – Achievement of Guidelines-Based Medical Management	• Promote guideline adherence for asthma diagnosis and treatment. • Expand Stock Inhaler Program statewide with training and maintenance funding. • Prioritize Stock Inhaler program expansion in underserved/rural counties with fewer school participation (only 13 counties currently engaged). • Encourage school-based reporting of asthma practices.	RD-04 – Reduce asthma attacks RD-D02 – Reduce hospitalizations (ages 5–64) RD-02 – Reduce ED visits in children

EXHALE Strategy	Key Recommendations (with priority themes)	HP2030 Alignment
L – Linkages and Coordination of Care	• Strengthen cross-sector care coordination between EDs, schools, and providers. • Emphasize prevention of ED visits as a central priority across all system. • Explore opportunities for data sharing and system linkages at the state level to more effectively capture and monitor the burden of asthma.	RD-03 – Reduce ED visits (ages 5+) RD-04 – Reduce asthma attacks RD-D01–D02 – Reduce hospitalizations
E – Environmental Policies & Best Practices	• Strengthen public education and local policy efforts addressing both indoor and outdoor air quality, including ozone, PM2.5/PM10, wildfire smoke, and indoor pollutants (e.g., mold, pests, gas stoves). • Strengthen IAQ enforcement in schools, housing, childcare. • Promote EPA's Tools for Schools and expand the Flag Program statewide (only a few counties actively participate). • Support policies to reduce vehicle idling near schools.	RD-04 – Reduce asthma attacks RD-D01–D03 – Reduce asthma hospitalizations RD-02 – Reduce ED visits in children

INTRODUCTION

LeCroy & Milligan Associates, Inc. was contracted by the Arizona Department of Health Service (ADHS)'s Bureau of Chronic Disease and Health Promotion to complete an Asthma Burden Report, using secondary data available. The purpose of this report is to inform statewide public health efforts to address asthma as a chronic health condition in Arizona and position ADHS and its partners to pursue future funding opportunities. In 2024, ADHS convened a statewide listening session to explore the CDC funding opportunity, *Advancing Health Equity in Asthma Control through EXHALE Strategies*. In collaboration with the American Lung Association (ALA), Arizona Asthma Coalition, and other stakeholders, the session identified critical data gaps in Arizona's asthma surveillance systems. As a result, a statewide asthma workgroup was formed to address these limitations and lay the foundation for an integrated and data-informed comprehensive Asthma Burden Report.

Arizona's previous Asthma Burden Report, released in 2016, provided a baseline of statewide asthma prevalence, healthcare utilization, and disparities using 2013-2014 data. It found that asthma prevalence in Arizona (9.6%) exceeded the national average (8.9%) and disproportionately affected American Indian adults and males under age 18. The 2016 report also showed more than 27,000 ED visits and $115 million in related healthcare charges in 2014 alone. The findings informed efforts to promote asthma education, reduce secondhand smoke exposure, and explore home-visiting programs to reduce environmental triggers. This 2025 report builds on that work by integrating newer surveillance sources, highlighting shifts in prevalence and utilization trends, and updating priorities aligned with CDC's EXHALE strategies, and Healthy People 2030 goals.

This report highlights secondary data related to asthma prevalence and surveillance among adults and children in Arizona and nationally. Information is presented on demographic and geographic asthma burdens; economic impacts and asthma-related mortality; emergency department (ED) and hospital utilization; home and school-related influences; environmental factors, such as air quality and pollutants; and relevant health policy considerations. The findings of this report are intended to support collaboration towards the future development of a comprehensive and equitable *Arizona Asthma Action Plan* and inform future funding requests.

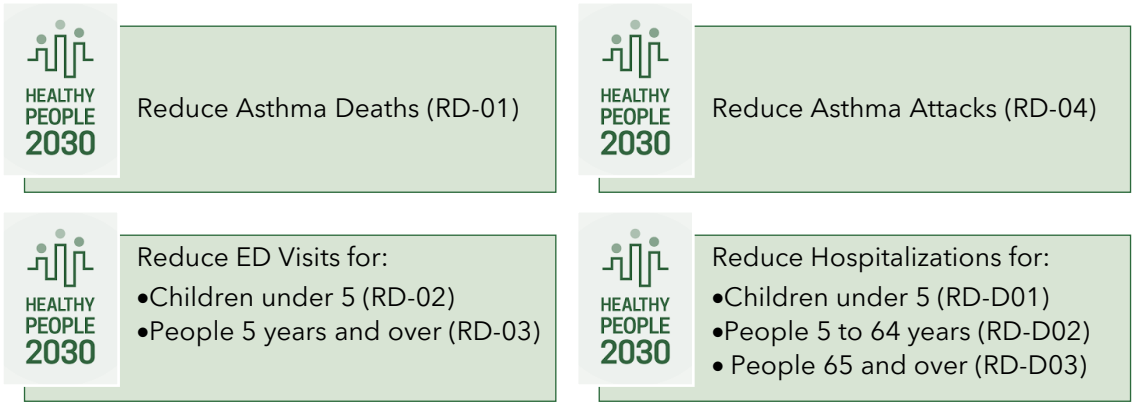
CDC EXHALE Framework

This report is aligned with the EXHALE Framework, developed by the Center for Disease Control and Prevention's (CDC) National Asthma Control Program (NACP). EXHALE incorporates six evidence-based strategies for improving asthma control and reducing health disparities. EXHALE provides a practical structure for stakeholders to interpret Arizona's asthma burden data, inform decision-making, and identify future opportunities for action across the surveillance, healthcare, education, housing, and environmental sectors.

Healthy People 2030 Objectives

Healthy People 2030 is a set of initiatives led by the U.S Department of Health and Human Services aimed at improving the nation's health and well-being. It includes specific asthma-related goals, objectives and metrics that are presented in this report. Healthy People 2030 is designed to guide coordinated, multisectoral efforts and inform health strategies using measurable goals and data-driven decision-making. The national targets and data-informed goals of the initiative can be used by stakeholders to prioritize asthma-related strategies at the state and local levels. This report references the following Healthy People 2030 asthma objectives for prioritizing asthma management.

Healthy People 2030 Asthma Related Goals



Arizona Health Improvement Plan

The 2021-2025 Arizona Health Improvement Plan (AZHIP) outlines five strategic priorities for the State of Arizona to address health disparities and improve health outcomes, Mental Health, Rural & Urban Undeserved Health, Health Equity, Health in All Policies/Social Determinants of Health and Pandemic Recovery/Resiliency. The AZHIP plan emphasizes building infrastructure and cross-sector partnerships that can reduce disease burden among disproportionately affected populations. This Asthma Burden Report supports AZHIP's goals by identifying populations at risk, highlighting health disparities, and providing evidence-based recommendations that align with the Plan's collaborative, equity-driven approach to improving population health.

Scope of the Problem

The ALA defines asthma as a chronic lung disease that makes it difficult for a person to move air in and out of their lungs. Asthma can occur at any age and is characterized by chest tightness, shortness of breath, and coughing or wheezing. Although there is no cure for asthma, it can be managed with appropriate diagnosis, treatment, and management. People with asthma can work with their healthcare providers to monitor their symptoms, identify triggers, and implement individualized plans to best manage their condition at home, school, and work.

Nearly 25 million people in the US have an asthma diagnosis, and in Arizona, the burden of asthma is particularly significant. From 2017-2021, Arizona adults have maintained 1.0-2.1 percentage points higher than the national average for lifetime asthma prevalence. While national childhood lifetime asthma prevalence has fluctuated slightly, from 10.5% in 2019 to 10.3% in 2023, Arizona's recent data indicate an increase in child current asthma prevalence. Additionally, Arizona has experienced a higher asthma mortality rate than the national average, with notable increases in 2016

and 2020. These patterns suggest a need for supported public health attention, surveillance, and targeted interventions to manage and reduce the asthma burden in the state, which affected 730,262 estimated children and adults in Arizona in 2023.

ASTHMA SURVEILLANCE

Asthma Prevalence

The CDC utilizes public health surveillance systems to monitor population health and health behaviors and track trends over time for US adults and children. For adult populations, the Behavioral Risk Factor Surveillance System (BRFSS) is an annual telephone-based survey that collects health-related data about health behaviors, chronic disease, healthcare access, and utilization of prevention services for US adults, including the District of Columbia and participating US territories. The Youth Risk Behavior Surveillance System (YRBSS) includes a school-based health survey for youth and young adults conducted every two years and state, territorial, tribal, and large urban school district surveys conducted by education and health agencies. The National Health Interview Survey (NHIS) is an annual survey that is collected through face-to-face interviews to monitor the health of the US population. It collects data on adults who also provide information about their children. The NHIS data is used to generate and track national health estimates and statistics for adults and children.

This report used the CDC's BRFSS results to report national and state-specific asthma surveillance data for adults (18 to 65+ yrs.) and the CDC's NHIS data for children (0-17 yrs.). Additionally, the ADHS 2023 Respiratory Burden Report provided youth prevalence data from the 2019 Arizona Youth Risk Behavior Survey (YRBS) results and the National Survey of Children's Health (NSCH) from 2017-2021. The NSCH surveys a parent or guardian about one randomly selected child per household (not all children in the home). Information is collected on factors related to the health and well-being of the child, including access to and utilization of health care, receipt of care in a medical home, family interactions, parental health, school and after-school experiences, and neighborhood characteristics. Data from the NSCH is used for research, federal policy and program development, and state-level planning and performance reporting.

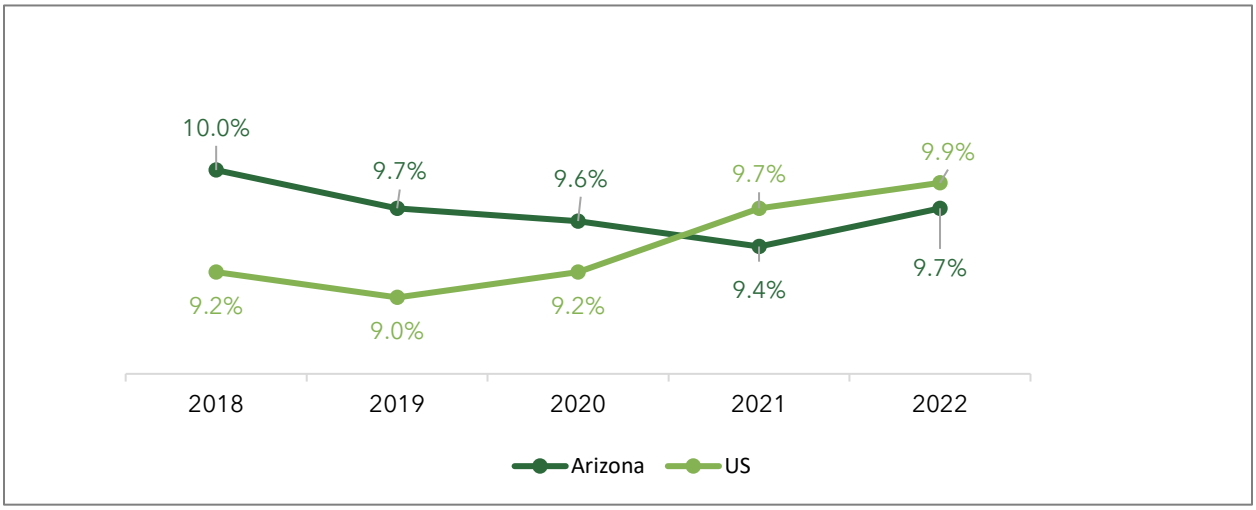
The CDC's surveillance uses *lifetime* and *current* asthma prevalence to report asthma rates on national and state levels. According to the CDC, current asthma prevalence is defined as the proportion of the population who currently has asthma and reported in the last 12-month period. Lifetime asthma prevalence is the proportion of the population that has had an asthma diagnosis at some point in their lifetime. Childhood current asthma is defined as the number of children who have asthma. Lifetime asthma

for children is defined in terms of the number of children who have ever been diagnosed with asthma. These CDC definitions were used to present the asthma surveillance data in this section, where applicable. Other surveillance systems' definitions for current and lifetime prevalence are provided with the respective data results.

Adult Asthma Current Prevalence

CDC current asthma prevalence data showed an overall decrease in asthma prevalence in Arizona from 2018 to 2021**. Although these years showed an overall decreasing trend, Arizona remained above the national average from 2018 to 2020. In 2021, Arizona dropped below the national rate (9.4% AZ vs 9.7% US) and in 2022 (9.7% AZ vs 9.9% US), representing 556,000 Arizona adults** (Exhibit 1). Arizona's average adult prevalence was at 9.68% compared to the national average of 9.40%. The 2016 Asthma Burden Report noted higher adult asthma prevalence in Arizona compared to the national average, estimating 484,000 adults (9.6%) affected in 2014.

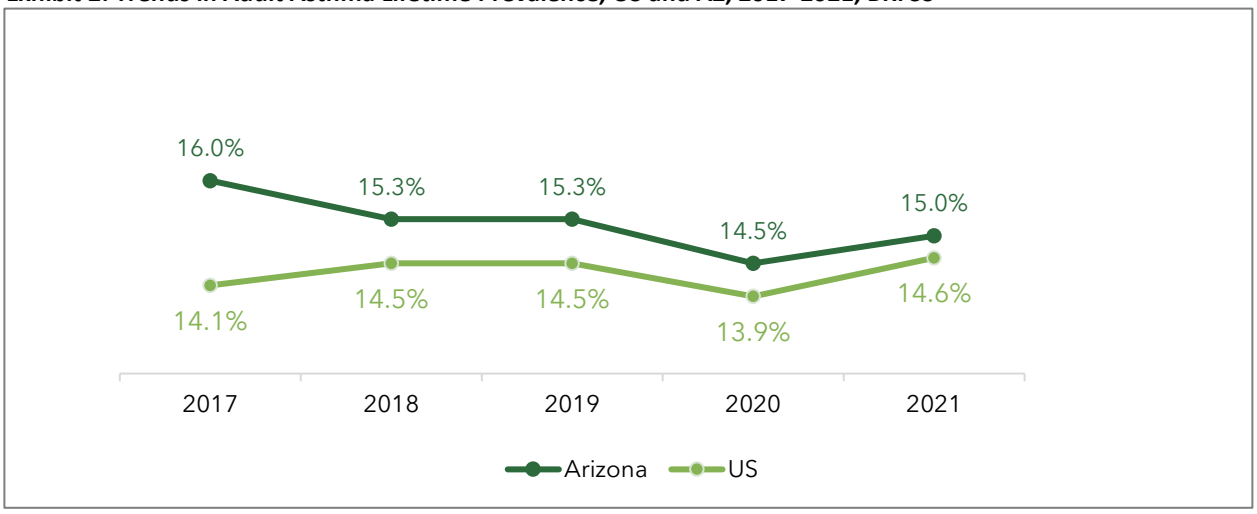
Exhibit 1. Trends in Adult Asthma Current Prevalence, US and AZ, 2018-2022, BRFSS



Adult Asthma Lifetime Prevalence

Data from the BRFSS (2017-2021) show that asthma lifetime prevalence rates in **Arizona adults were higher than the national average from 2017 to 2021**. Overall, Arizona's adult asthma prevalence rate has declined each year from 2017 to 2020, with a slight increase from 2020 (14.5%) to 2021 (15.0%) (Exhibit 2). These trends highlight a burden of asthma in Arizona adults relative to national levels. Adult current asthma prevalence is reported for 2018–2022, while adult lifetime asthma prevalence is shown for 2017–2021, since 2022 state-level data were not yet available at the time of analysis.

Exhibit 2. Trends in Adult Asthma Lifetime Prevalence, US and AZ, 2017-2021, BRFSS



Child Asthma Current Prevalence

According to the NHIS[2], asthma current prevalence question, "Does your child still have asthma?" is asked about children in the sample who were told by a doctor or other health professional that they ever had asthma. The current prevalence of asthma (2019-2023) among children in the US decreased in 2020, which may be related to response rates or access to care during the COVID-19 pandemic. Starting in 2021, asthma prevalence increased, followed by a small dip in 2022 and a subsequent increase to 6.7% in 2023 (Exhibit 3). Although there are no comparable NHIS child prevalence data available for Arizona, the NSCH reported current asthma prevalence for children aged 0-17 in Arizona from 2019-2023 (Exhibit 4.) NSCH Arizona child asthma prevalence data showed a general **downward trend from 2016 to 2021**, from **8.9% in 2016–2017** to **6.6% in 2020–2021**. However, the most recent data from **2022–2023 indicates an increase, with prevalence rising to 8.7%**, which represents about 200,000 children based on population estimates. The 2016 Asthma Burden Report estimated child prevalence at 9.2% in 2014, which was above the national average, affecting 174,000 Arizona children.

[2] NHIS-Child Summary Health Statistics, Current asthma for children under age 18 years, US, 2019-2023.

Exhibit 3. Trend in Child Asthma Current Prevalence, US only, 2019-2023, NHIS

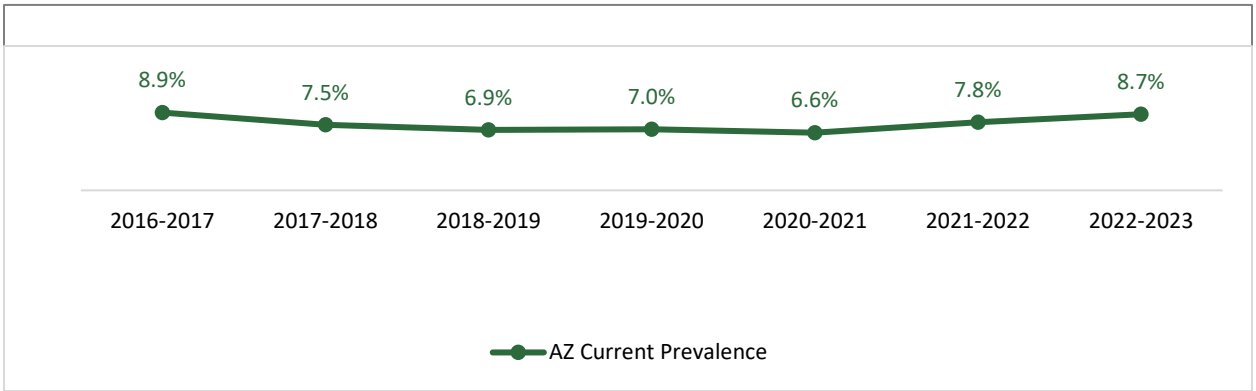
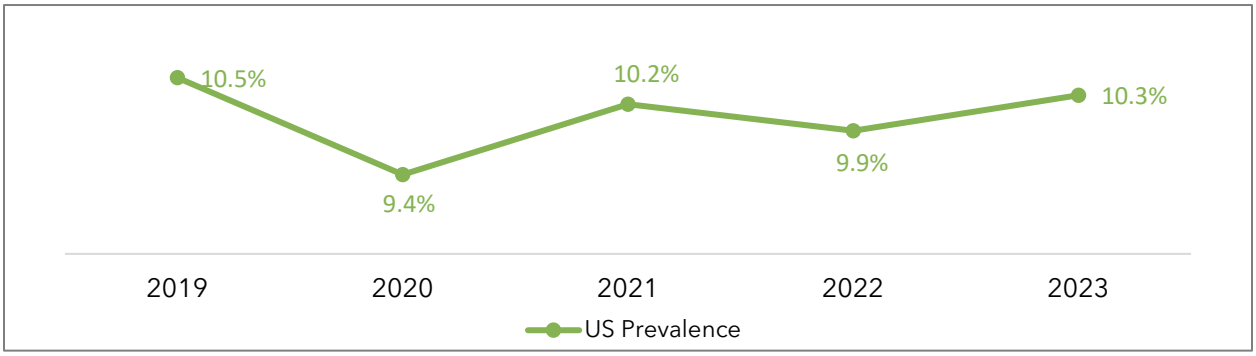


Exhibit 4. Trend in Child Asthma Current Prevalence, Arizona, 2016-2023, NSCH

Child Asthma Lifetime Prevalence

According to the NHIS 2019-2023 results[3], **the lifetime prevalence of asthma in children in the US fluctuated from its highest level at 10.5% in 2019 to 10.3% in 2023**. There was a sharp decline noted in 2020 (9.4%), with a slight increase in 2021 and then another dip in 2022 (Exhibit 5). Arizona was not included in the NHIS state-level subgroup estimates for child lifetime asthma prevalence, and therefore, no comparable NHIS lifetime prevalence data are available for Arizona.

Exhibit 5. Trends in Child Asthma Lifetime Prevalence, US, 2019-2023, NHIS



Demographic Information

CDC data provides current asthma prevalence for adults and children across various age, gender, race, and ethnicity subgroups (Exhibits 6-9 Adult, Exhibits 10-14 Child). Data labeled N/A was not available from the CDC. A table presenting child lifetime asthma prevalence data by these subgroups, along with 5-year averages, is detailed in Appendix B.

3 NHIS-Child Summary Health Statistics, Ever having asthma for children under age 18 years, US, 2019-2023.

Adult Demographics

Between 2017 and 2021, current asthma prevalence among adults in Arizona varied across age, gender, and race/ethnicity groups, with trends both aligning with and diverging from national averages. Exhibit 6 presents the overall highlights from the secondary data analysis for trends in current asthma prevalence for adults based on age groups, gender, and racial categories. Current asthma prevalence was highest among adults aged 18–44 in both Arizona and the U.S., with a general decline among older age groups. This trend remained consistent throughout the five-year period (Exhibit 7). Female adults in Arizona reported higher current asthma prevalence rates than males, aligning with national data (Exhibit 8). American Indian/Alaska Native adults in Arizona demonstrated higher current asthma prevalence compared to other racial/ethnic groups and the national average. Hispanic and Black adults also showed elevated rates compared to White non-Hispanic adults (Exhibit 9).

Exhibit 6. Highlights of Adult Asthma Current Prevalence by Age, Gender, Race, and Ethnicity

Young adults aged 18–24 experienced a sharp increase in prevalence in 2021 (14.0% in Arizona vs.10.9% nationally), while other age groups remained relatively stable or declined.

Adult Females consistently showed higher asthma current prevalence than males across all years, mirroring national patterns, with a 2021 prevalence of 12.2% in females in Arizona vs. 6.5% in males in Arizona.

Multiracial non-Hispanic adults showed dramatic fluctuations in Arizona, peaking at 25.9% in 2018 and then dropping to 7.0% in 2021. This data point may be recommended for further investigation.

Black non-Hispanic adults had persistently higher asthma prevalence in Arizona, (13.1%) compared to national data, (11.7%), though a notable dip occurred in 2020, most likely due to COVID-19.

Hispanic and "Other" non-Hispanic groups generally reported lower prevalence, though data limitations exist for 2021.

Exhibit 7. Adult Asthma Current Prevalence, US and AZ, by Age, 2017-2021, BRFSS

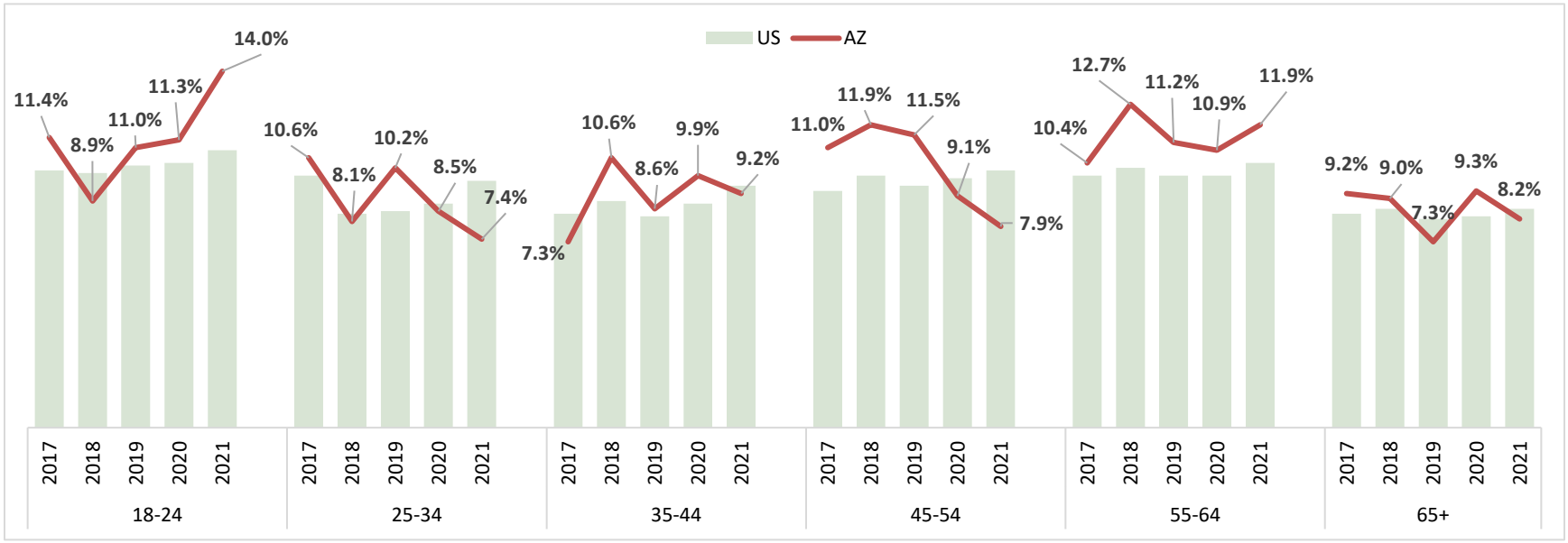


Exhibit 8. Adult Asthma Current Prevalence, US and AZ, by Gender, 2017-2021, BRFSS

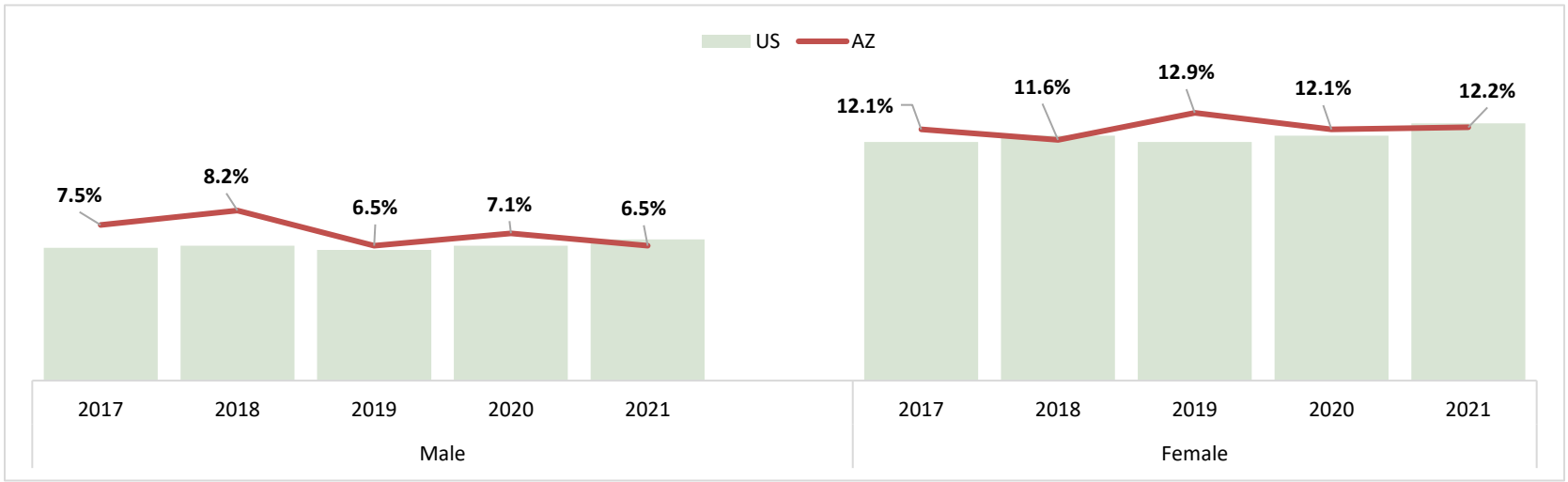
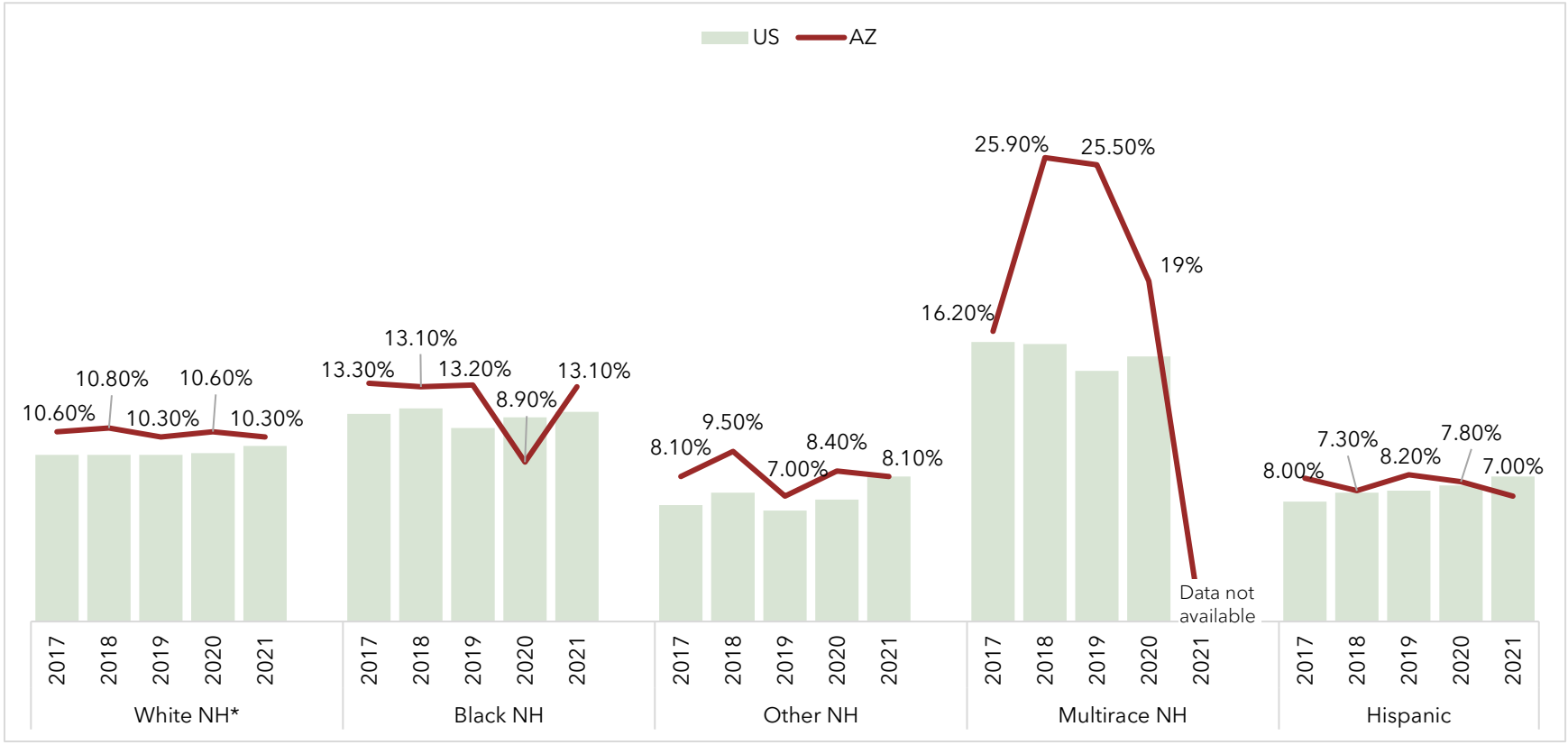


Exhibit 9. Adult Asthma Prevalence, US and AZ, by Race/Ethnicity, 2017-2021, BRFSS



*NH is Non-Hispanic. CDC data not available for Multirace Non-Hispanic during 2021(shown as 0%).

Child Demographics U.S.

NHIS data from 2019 to 2023 revealed persistent differences in childhood lifetime asthma prevalence by age, gender, and race/ethnicity (Exhibits 10-12). The summary below highlights some of the disparities noted among U.S. children in these categories. Although there was no NHIS specific child-related data available for Arizona, the ADHS Respiratory Burden Report 2023 captured the Youth Risk Behavior Surveillance System data for Arizona youth grades 9-12 (Exhibit 14). Since these national and state data are from separate data sources, the results are presented individually.

- The NHIS data showed the 12-17 age group had the highest childhood lifetime asthma prevalence, peaking at 15.6% in 2023, and a 5-year average of 14.7%.
- The **children 0–4 age group had the lowest rates of childhood lifetime asthma** with a 5-year average of 3.3% (ranging from 2.6% in 2021 to 3.9% in 2023).
- On average, from 2020 - 2023, **male children had a 5-year lifetime asthma prevalence of 6.8%, while female children averaged 6.1%.** The 2016 Asthma Burden Report noted male children more likely to have asthma than female children. The recent 2022-2023 rates show the difference between male and female rates is narrowing.
- **Black non-Hispanic children had the highest lifetime prevalence of childhood asthma across all racial groups**, with a 5-year average of **11.6%.** Mexican/Mexican American children reported lowest rates, averaging 5.2%, followed by White, non-Hispanic (5.5%) and Hispanic children overall (5.9%).

Exhibit 10. Average Child Lifetime Asthma Prevalence by Age Group, 2019-2021, NHIS

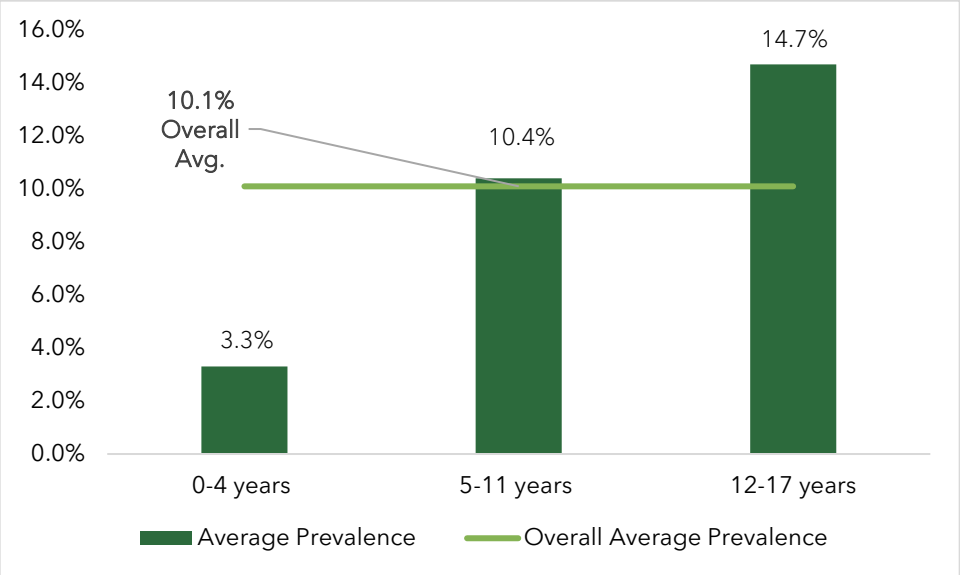
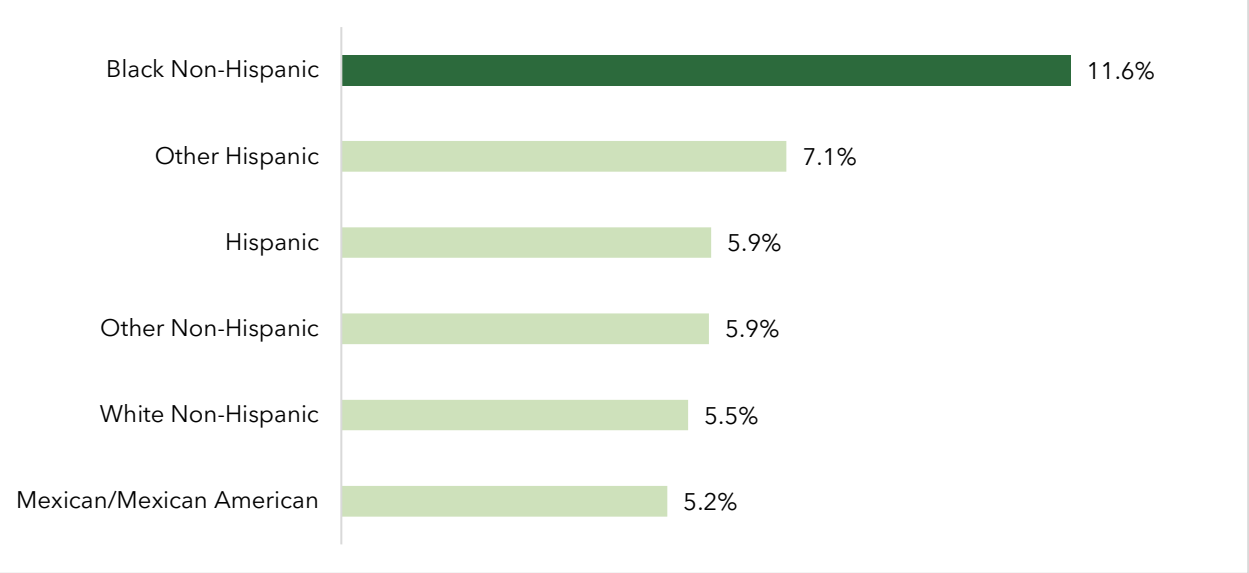


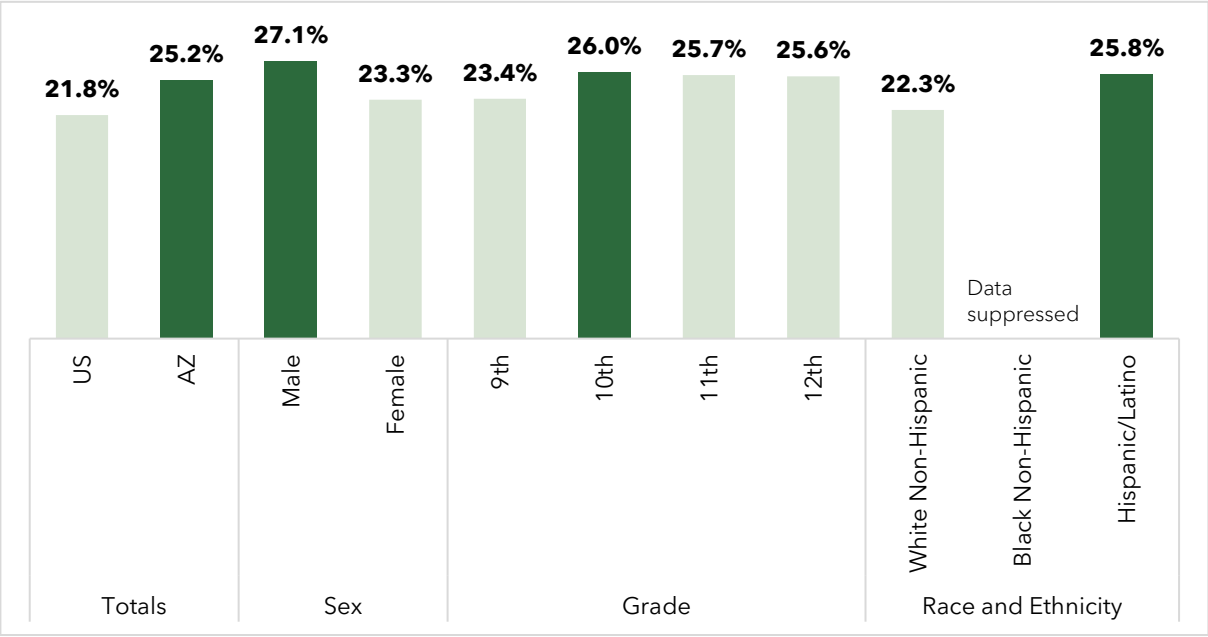
Exhibit 11. Average of Child Lifetime Asthma Prevalence by Race/Ethnicity, 2019-2021, NHIS



Child Demographics Arizona

The ADHS 2023 Respiratory Burden Report presented asthma prevalence results from the Arizona Youth Risk Behavior Survey (YRBS) for participants in grades 9-12. **Ninth through twelfth graders reported a higher prevalence of self-reported asthma (25.2%) as compared to the United States (21.8%) in 2019** (Exhibit 12). The prevalence of *self-reported* asthma was highest among males (27.1%), 10th graders (26.0%), and Hispanic/Latinos (25.8%).

Exhibit 12. Child Asthma Lifetime Prevalence, *Self-report* by Gender, Grade, Race/Ethnicity, 2019, BRFSS



Source: ADHS Respiratory Burden Report, 2023. The most recent asthma data is from 2019. The 2021 YRBS did not include the question asthma prevalence question, and Arizona was not able to obtain data in 2023 due to low participation. Note: Black Non-Hispanic data was suppressed due to fewer than 1000 students in this subgroup.

National Health Interview Survey (NHIS) data from 2019 to 2023 revealed consistent disparities in childhood asthma prevalence across age, gender, and race/ethnicity. Notably, Black non-Hispanic children had the highest reported prevalence nationally in 2019 (13.5%), 2020 (8.9%), and 2021 (12.5%), while Hispanic and Mexican American children had consistently lower rates. However, no NHIS data specific to Arizona's child population were available for this time period. Additionally, the 2016 Asthma Burden Report NHIS results also indicated Black/African Americans demonstrating higher rates of asthma compared to their White and Hispanic counterparts.

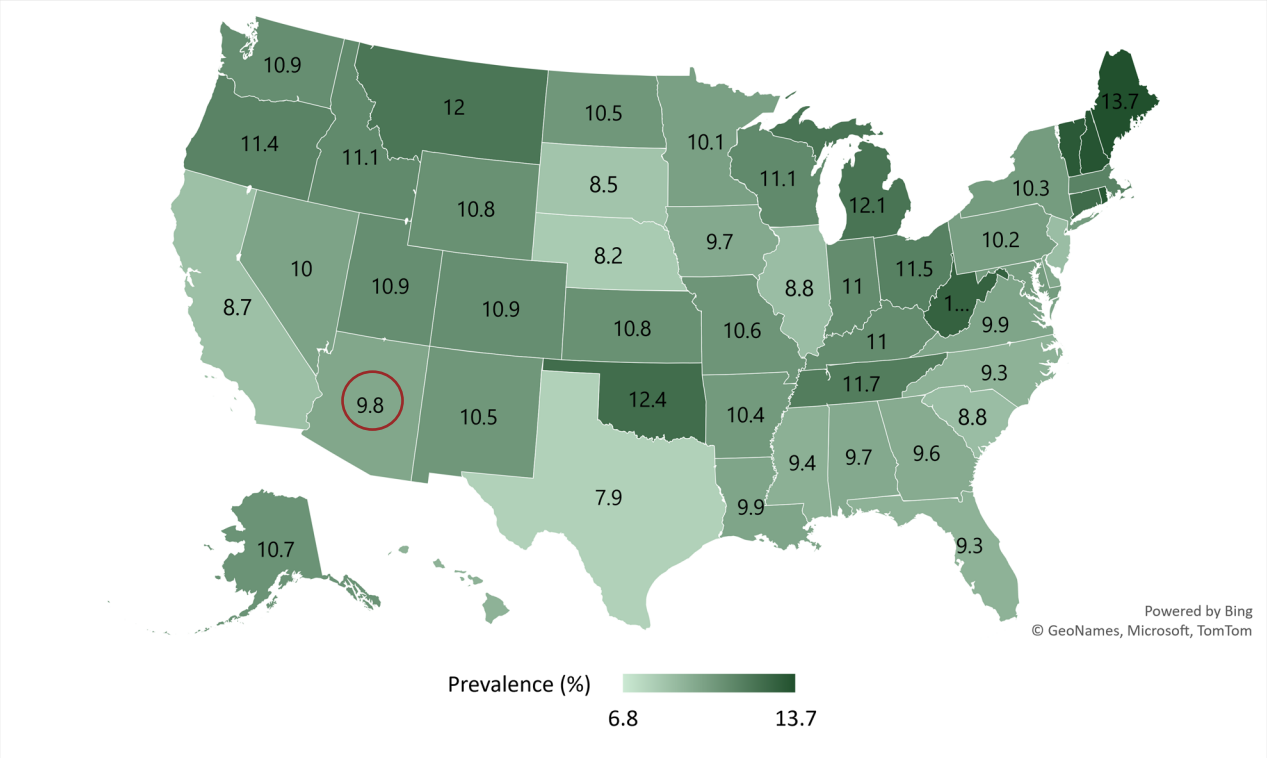
Data from the Arizona Youth Risk Behavior Surveillance System (YRBS) were used to supplement state-level status, and to estimate asthma prevalence among students in grades 9–12. These results should be interpreted separately, as they differ in methodology (self-reported vs. parent-reported), age range, and racial/ethnic categorization. For example, national NHIS data highlight increased asthma prevalence among Black non-Hispanic children, while Arizona YRBS results did not report this subgroup data due to suppression for subgroups with less than 100 students. The Arizona YRBS results showed Hispanic/Latino youth reported the highest asthma rates (25.8%), followed by males (27.1%) and 10th-grade students (26.0%). These differences demonstrate the importance of using multiple data sources to present a

more complete picture of asthma burden among children, while also recognizing the discrepancies in methodology.

Geographic Distribution of Asthma

According to the 2022 BRFSS data, asthma prevalence in the U.S. ranged from a low of 6.8% in Guam to a high of 13.7% in Maine (Exhibit 13). Arizona's overall asthma prevalence rate was 9.8%, which was slightly below the national average of 10.6%. States not shown on the map are presented on the table below the map. Asthma prevalence reflects who answered "yes" to *both* BRFSS questions: "Have you EVER been told by a doctor or other health professional that you had asthma?" and "Do you still have asthma?"

Exhibit 13. Map of Adult Asthma Prevalence, US, 2022 BRFSS



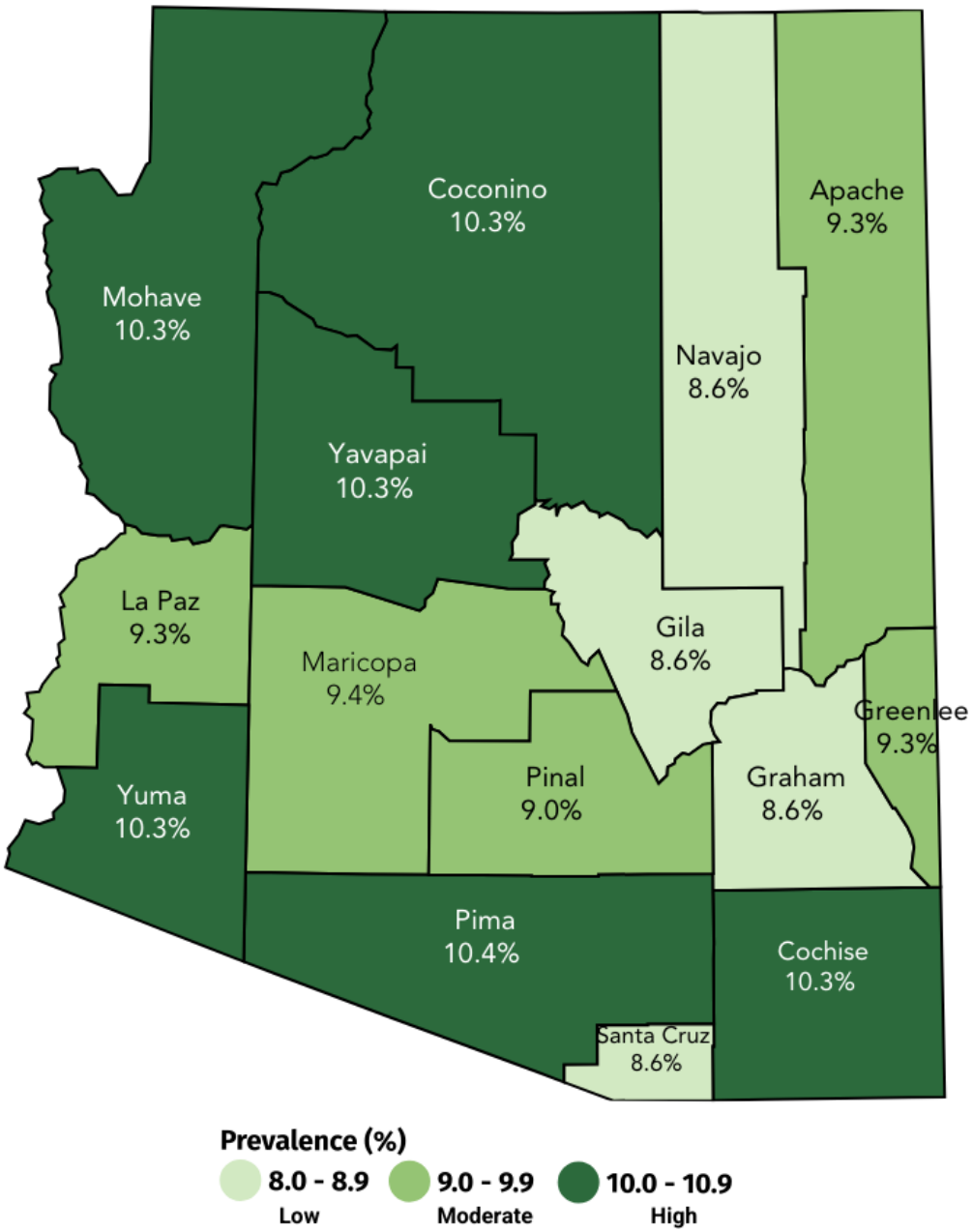
State prevalence not shown on map:

Guam	HI	NJ	DE	MD	NY	MA	CT	VT	RI	NH
6.8	9.3	8.8	9.8	10.3	10.3	11.4	12.5	13.3	13.4	13.5

Asthma prevalence across Arizona's 15 counties was obtained from the CDC BRFSS, using combined data from 2019 through 2022. **The overall prevalence by county ranged from 8.6% to 10.4%.** Gila, Graham, Navajo, and Santa Cruz Counties represented the lowest prevalence percentage at 8.6%. Maricopa, Apache, La Paz, Greenlee, and Pinal Counties demonstrated moderate prevalence between 9.0 to 9.4%.

Coconino, Mohave, Yavapai, Yuma, and Cochise Counties fell into a higher range, with a prevalence of 10.3%. **Pima County reported the highest asthma prevalence at 10.4%** (Exhibit 14).

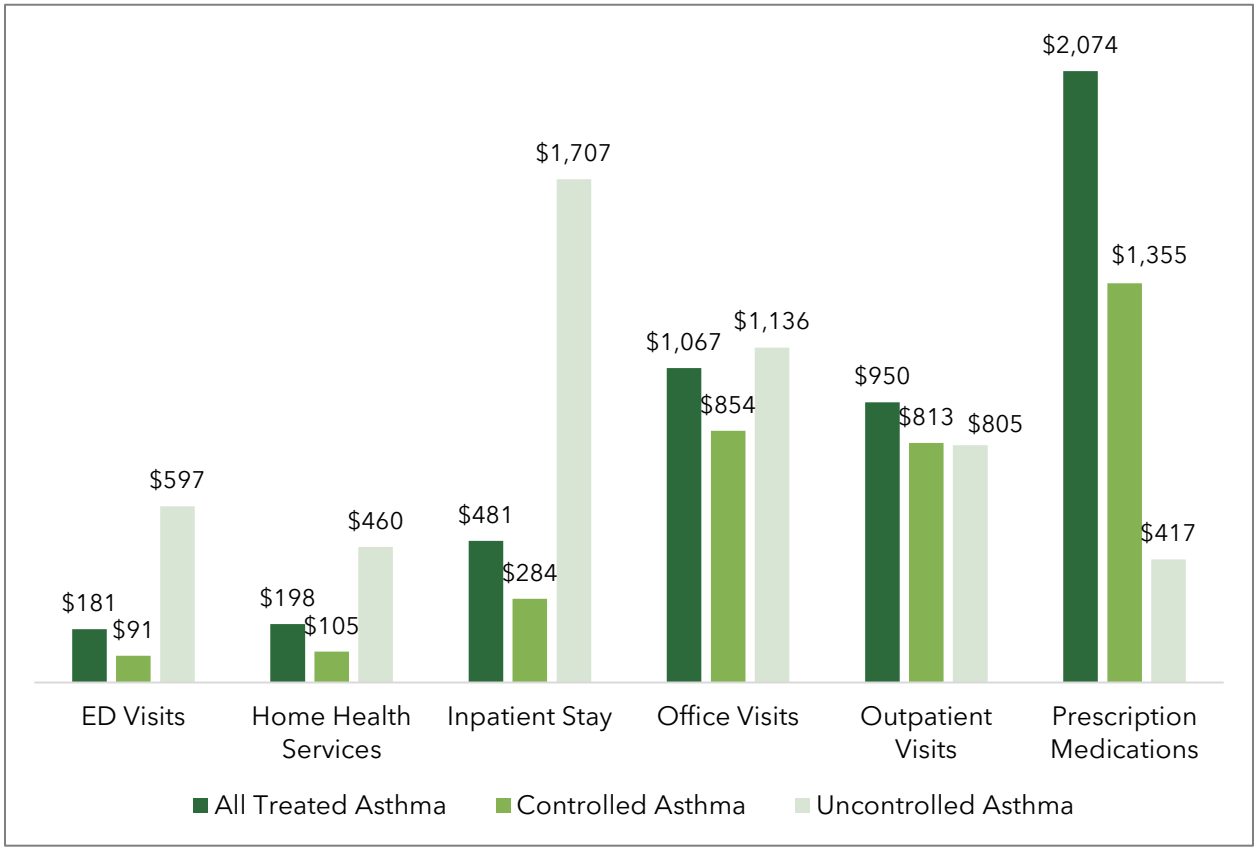
Exhibit 14. Map of Asthma Prevalence by County, 2019-2022 BRFSS



Economic Factors

The CDC National Asthma Control Program's (NACP) asthma cost calculator[4,5] analyzes data to estimate the economic impact of managing an asthma diagnosis for individuals, states, and the nation. Estimates for Arizona revealed an individual's incremental cost of **$4,995.48.**[6] The NACP provides data on asthma cost for medical services by people with controlled and uncontrolled asthma (Exhibit 15). Although costs can vary by each factor, **people with uncontrolled asthma pay significantly higher costs for inpatient hospital stays and ED visits (i.e., acute care)** than **people with controlled asthma who pay higher costs for medications but lower costs for acute care.**

Exhibit 15. Annual Cost of Asthma by Medical Service Type and Control Level, AZ, NACP



[4] Asthma Cost Calculator | NACP | CDC

[5] The estimates and future projections displayed are based on preliminary models and limited data sources, which are subject to further refinement and validation. As such, the information should be interpreted with caution and should not be considered final.

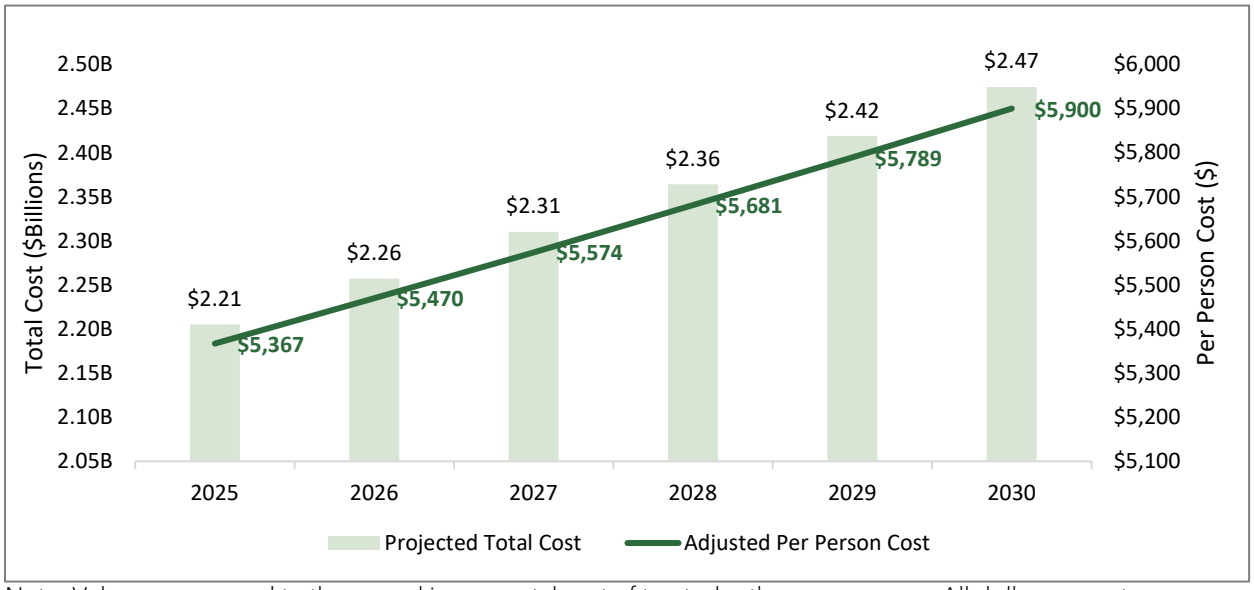
[6] Per-Person Incremental Cost: The average difference in the amount of health expenditures that a person with treated asthma spends and the amount this very person would have spent if she or he did not have asthma.

Projected Cost of Asthma

The NACP also provides estimators to project the total cost of asthma per individual as well as the total projected cost by state. Both total and per-person costs are projected to grow gradually over the six-year period.

The overall total projected cost shows a steady increase from just over $2.2 billion in 2025 to nearly $2.5 billion by 2030 (Exhibit 16). The per-person cost is also rising, from approximately $5,300 in 2025 to $5,900 in 2030.

Exhibit 16. Asthma Cost Projections, Arizona, 2025-2030, NACP



Note: Values correspond to the annual incremental cost of treated asthma per person. All dollar amounts are expressed in 2021 US Dollars.

Asthma Mortality

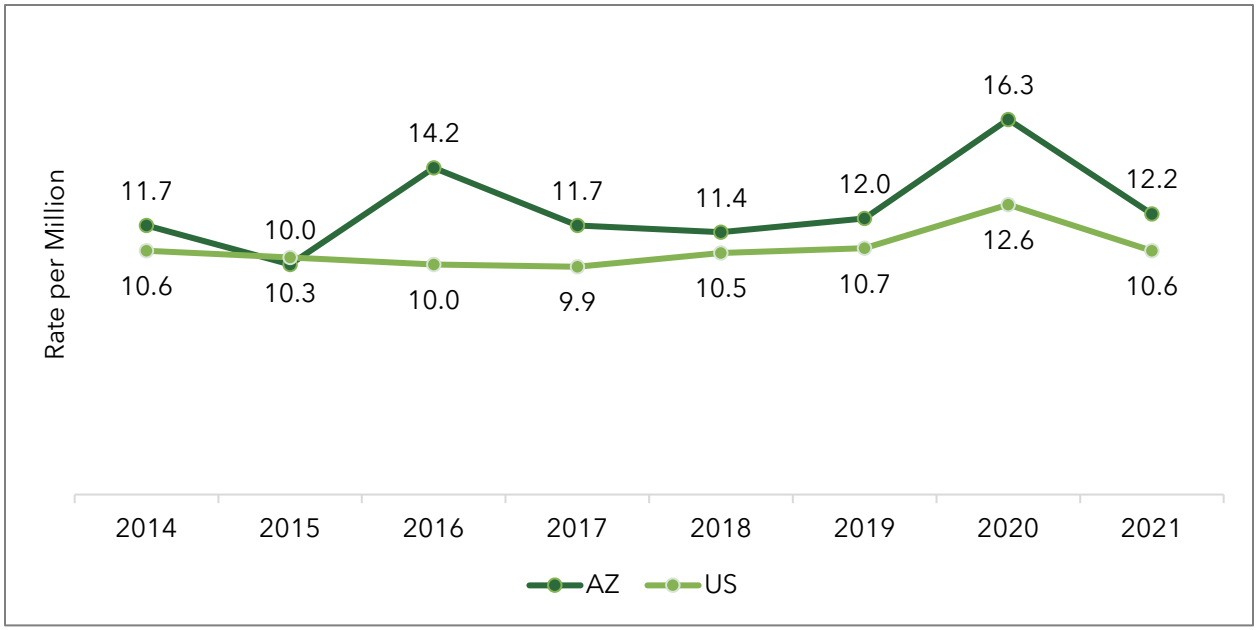
CDC asthma surveillance data were used to compare asthma mortality trends between U.S. and Arizona[7] (Exhibit 17). Arizona has experienced higher asthma mortality rates than the national average since 2016. The US mortality rate averaged 10.6 deaths per 1,000,000, and Arizona has averaged 13.6 deaths per 1,000,000.

Arizona has consistently demonstrated higher asthma mortality rates than the national average, with notable increases in 2016 and 2020. In 2021, there were 89 asthma-related deaths in Arizona[8].

[7] Asthma Surveillance Data | Asthma Data | CDC
[8] Most Recent Asthma State Data | CDC

CDC data also provides national asthma mortality by sociodemographic characteristics, such as age, gender, race and ethnicity[9]. The 2021 data showed higher asthma related deaths among females (12.5%) than males (8.7%) and Black non-Hispanics (24.4%) compared to all other groups including White non-Hispanic (9.8%), American Indian/Alaska Native, Asian or Native Hawaiian or other Pacific Islander (6.8%). The 2016 Asthma Burden Report also noted comparable gender and race disparities in Arizona.

Exhibit 17. Trends in Asthma Mortality, AZ and US, 2014-2021, CDC



Health Care Utilization

Emergency Department and Hospital Inpatient Discharges

Arizona Hospital Discharge Data (HDD)[10] provided ED and hospital inpatient (IP) discharge data for **asthma as the first diagnosis** from 2014-2023. ED discharges reported here represent "pure" ED visits where a patient is admitted to the ED and discharged from the ED. These data were analyzed to assess the utilization trends across the state and county (Exhibits 19-20), by gender (Exhibit 21), and age groups (Exhibit 22). The 2016 Asthma Burden Report presented 2013 health care data that demonstrated approximately 56% of asthma-related ED visits and 53% of hospitalizations were paid for by public payers, such as Medicaid and Medicare as compared to PPOs, HMOs, commercial and self-pay. These publicly funded sources paid for a significant portion of asthma-related care. This report does not have

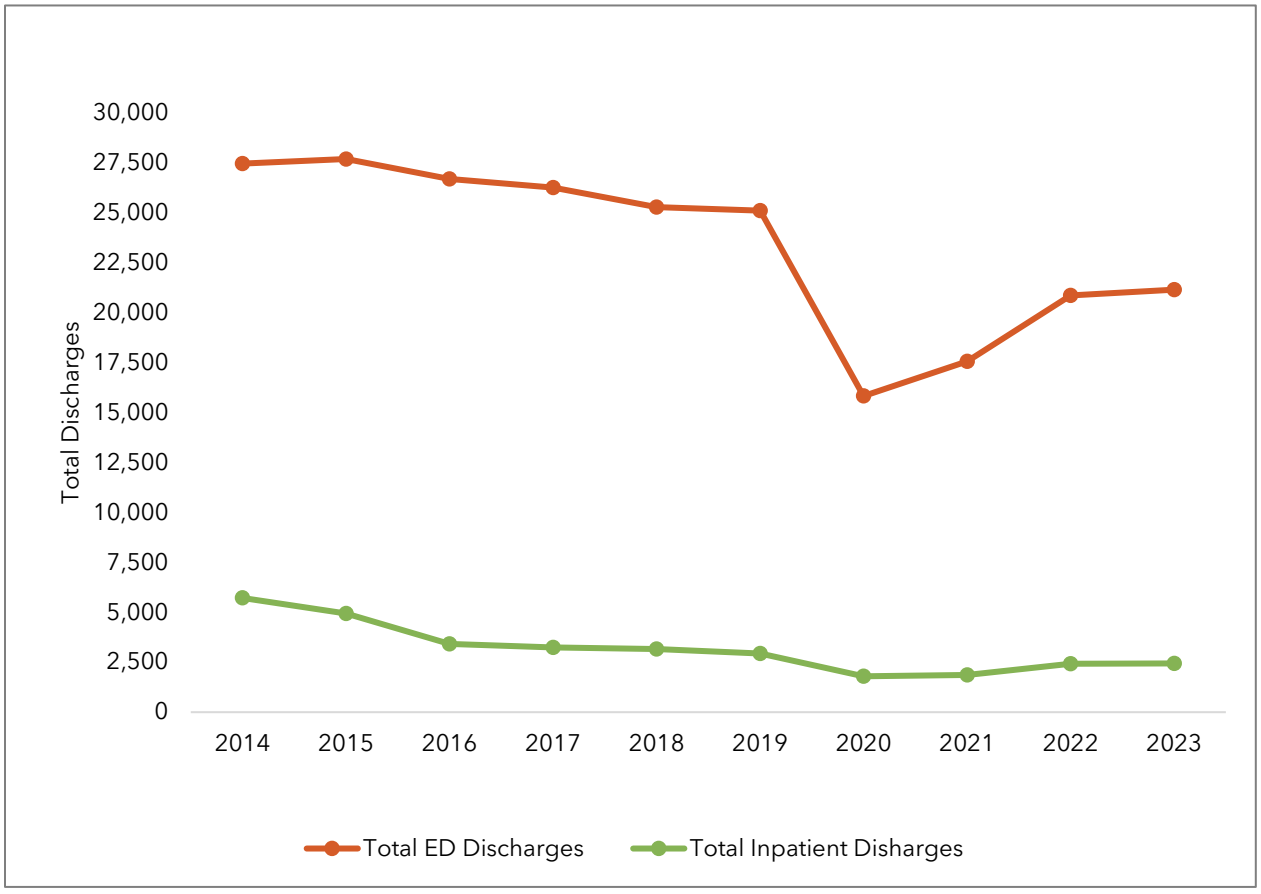
[9] Most Recent National Asthma Data | CDC
[10] ADHS - Hospital Discharge Data - Home

updated insurance cost data for comparison as noted in the limitations section. However, insurance cost data is valuable to advocate for prevention efforts.

State Level ED and Inpatient Discharges

State-level discharge data showed that total **ED discharges remained fairly stable between 2014 and 2019, followed by a dip to below 15,000 in 2020**, most likely due to changes in healthcare utilization during COVID-19 (Exhibit 18). In the years after COVID-19, the number of **ED discharges gradually increased to just over 20,000 in 2023**. Despite the increase, ED discharges remained below pre-pandemic levels. In contrast, the **IP discharges demonstrated a steady decline across the 10 years** from 5,500 in 2014, with a dip in 2020, similar to the ED trend for COVID-19. Although there were small increases in inpatient discharges after COVID-19, the 2023 total remained lower than pre-pandemic years at approximately 2,400.

Exhibit 18. Trends in Asthma ED and Inpatient Discharges, Arizona, 2014-2023, HDD



County Level ED and Inpatient Discharges

County level ED and Inpatient discharge data are presented in two visuals that represent the distribution of ED discharges and Inpatient discharges by county, at the

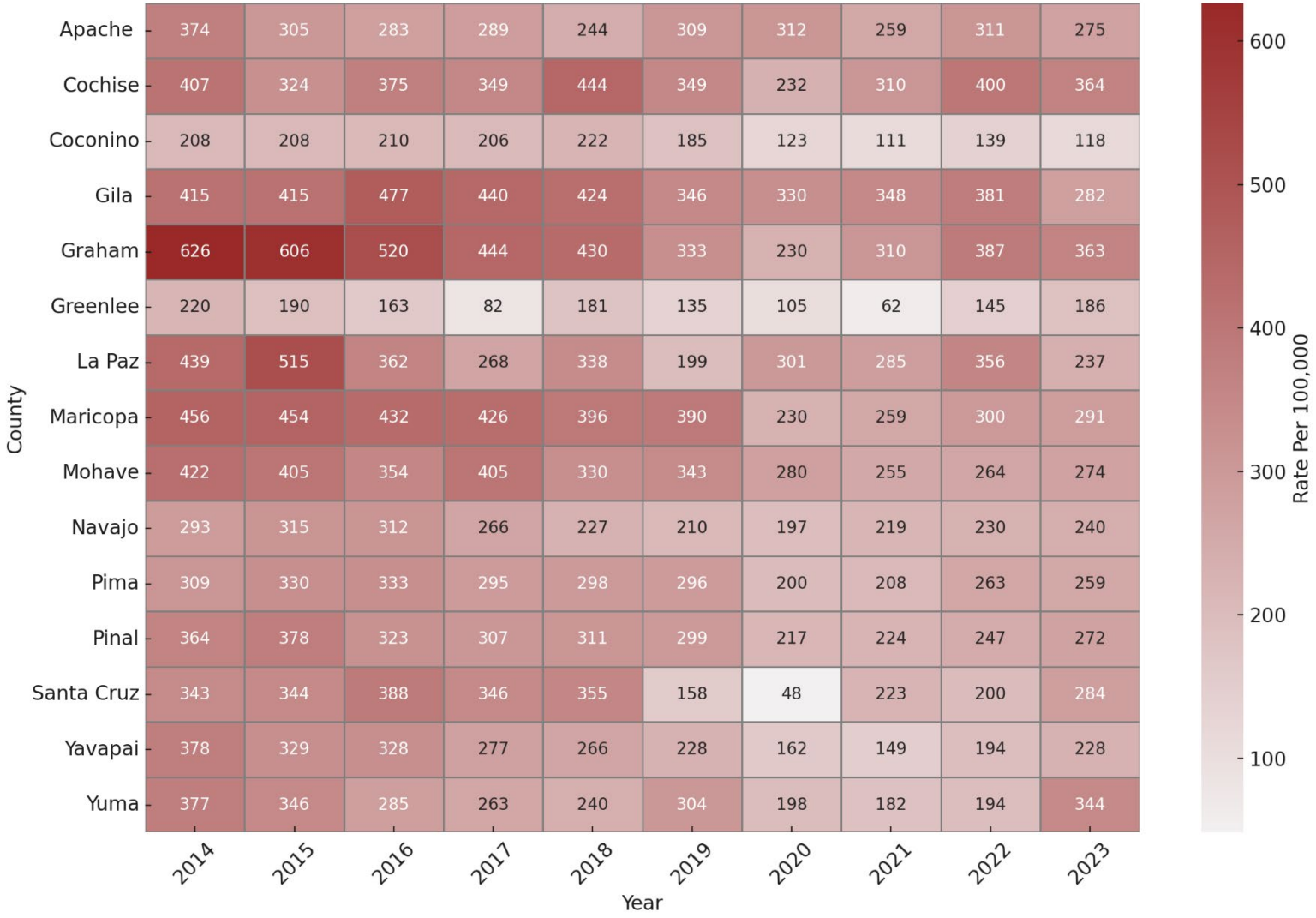
rate per 100,000 of the population based on ADHS population estimates[11] for each year from 2014-2023 (Exhibits 19 and 20). Data suppression was applied to counts less than 6 per year. County discharge rates are color-coded by intensity, with darker shades indicating higher rates and lighter shades indicating lower rates in both Exhibits.

Emergency Department discharge rates for asthma varied by county and by year across the 10-year period. Counties such as **Graham, Gila and La Paz** experienced the **highest asthma related ED discharge rates**, at above 400 discharges per 100,00 population. **Greenlee and Coconino maintained lower rates** (below 200, per 100,000 population).

Although, Maricopa, Pima and Pinal counties have larger populations, their ED discharge rates were in the moderate range. For example, Maricopa County showed a decline in their ED rates over the 10-year period. Smaller, more rural counties, such as Gila and Graham demonstrated high rates per 100,000 of the population.

[11] https://pub.azdhs.gov/health-stats/menu/info/pop/index.php

Exhibit 19. Trends in Asthma ED Discharges, by County, 2014-2023, HDD



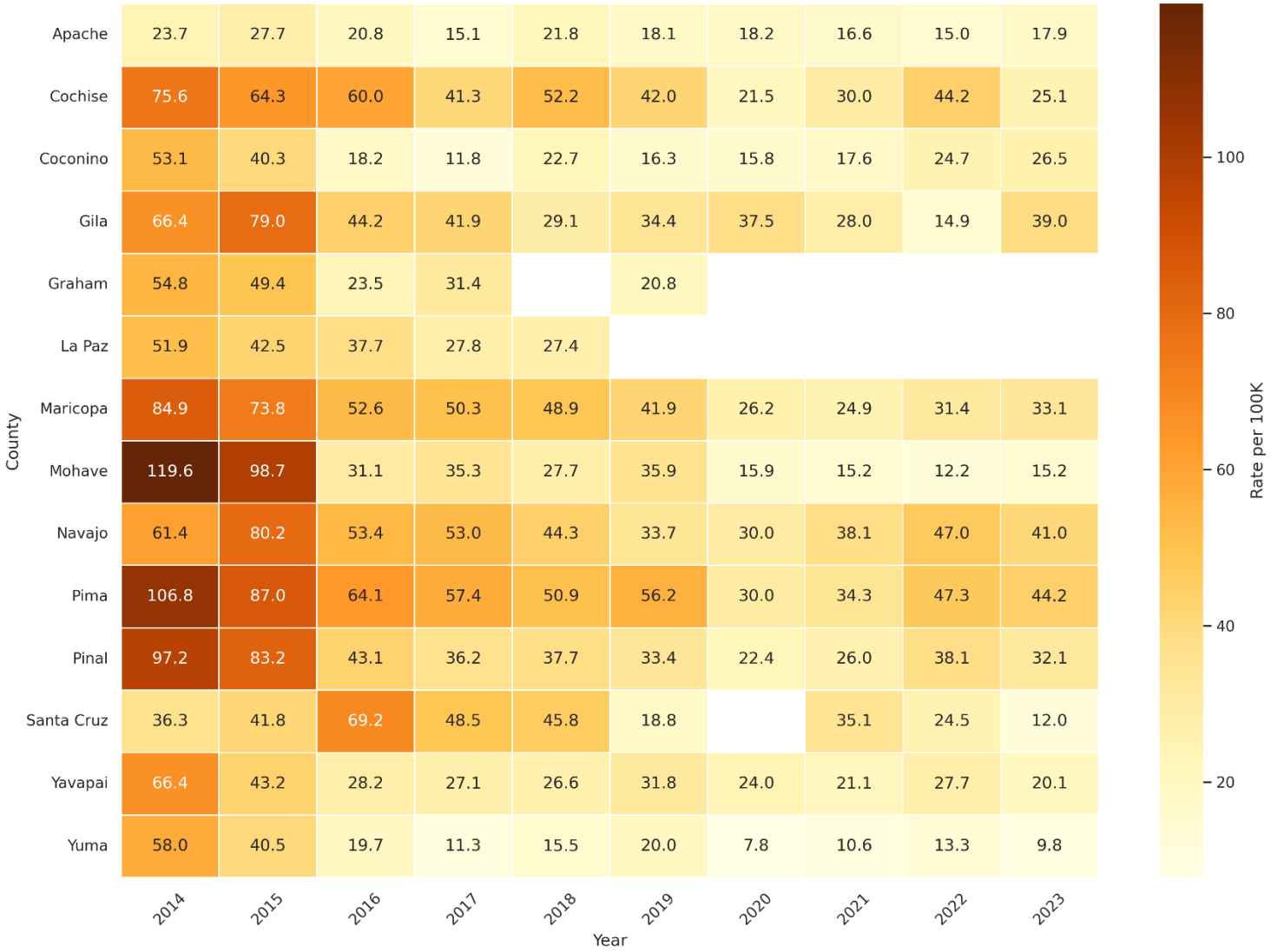
Inpatient Discharges by County 2014-2023

Regarding inpatient discharges, most counties reported 10 years of inpatient data represented in Exhibit 20. Counties with counts less than 6 across multiple years including Graham, La Paz, and Santa Cruz show blanks due to suppressed data. Greenlee not shown due to counts less than 6 across all years.

Some geographic disparities were noted for asthma-related inpatient discharges as rates per 100,000 population. **Rural and smaller counties often demonstrated disproportionately higher inpatient discharge rates per 100,000 population. Larger counties such as Maricopa and Pima demonstrated more moderate rates per 100,000 population** and were often lower than smaller counties.

Counties such as Apache, Gila, Mohave, and Cochise consistently exhibited elevated inpatient discharge rates relative to other counties, highlighting disparities in asthma-related hospitalizations. These counties, though more rural and with smaller populations, experience higher asthma-related hospitalization burdens. In contrast, larger counties like Maricopa and Pima had lower inpatient discharge rates per 100,000 population despite having the highest absolute number of discharges.

Exhibit 20. Trends in Asthma Inpatient Discharges, by County, 2014-2023, HDD

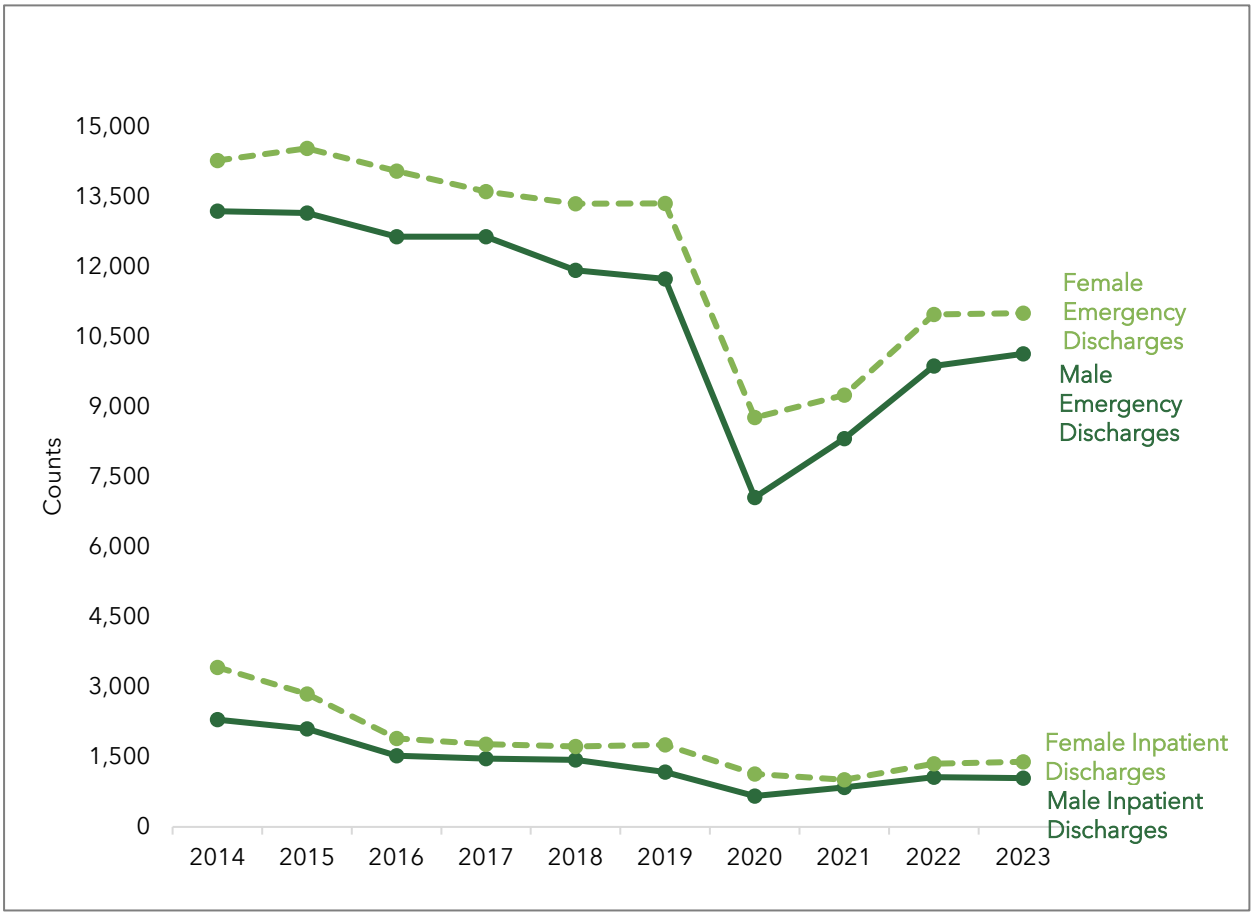


Blank cells indicate data suppressed for counts less than 6. Greenlee not shown due to counts less than 6 across all years.

Emergency Department and Inpatient Discharges Across Age and Gender

Overall, ED discharges related to **asthma as the first diagnosis** gradually declined from 2014 to 2019 and then declined sharply in 2020, most likely due to the impact of the COVID-19 pandemic (Exhibit 21.) While ED discharges increased after 2020, they remained below pre-pandemic levels. Throughout the 10 years, **females maintained higher ED discharge rates than males**. **Inpatient discharges were lower than ED discharges** overall for both males and females. There was also a gradual decrease from 2014 to 2020, with a similar sharp decline in 2020. **Inpatient discharge rates slowly increased from 2021 to 2023 but remained slightly lower than pre-2020 rates.**

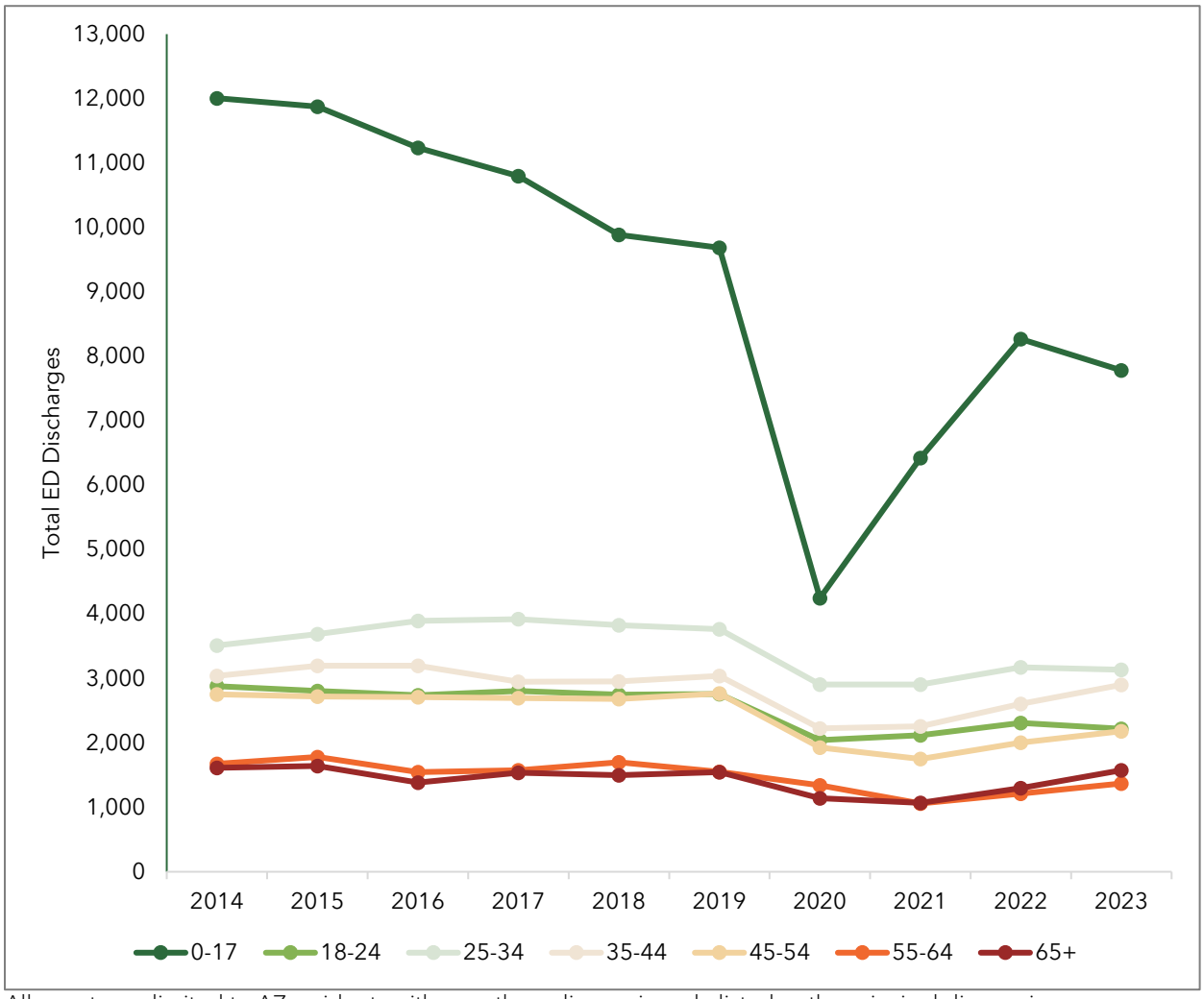
Exhibit 21. Trends in Asthma Emergency and Inpatient Discharges by Gender, 2014-2023, HDD



All counts are limited to AZ residents with an asthma diagnosis code listed as the principal diagnosis.
Discharges before Oct 1, 2015, used ICD-9 code 493. Discharges Oct 1, 2015, and onward used ICD-10 code J45.

Trends in ED discharges by age groups revealed the 0–17 age group consistently had the highest discharge counts, with a gradual decline across the 10 years (Exhibit 22). In 2020, there was a sharp decline noted, most likely due to the COVID-19 pandemic. The other age groups remained moderately stable but demonstrated slight changes after 2020.

Exhibit 22. Trends in Emergency Department Discharges by Age Groups, 2014-2023, HDD



All counts are limited to AZ residents with an asthma diagnosis code listed as the principal diagnosis.
Discharges before Oct. 1, 2015, used ICD-9 code 493. Discharges from Oct. 1, 2015, onward used ICD-10 code J45.

Asthma in Community Settings (Homes, Schools)

Asthma remains a considerable public health concern within community settings, particularly impacting children in both home and school environments. In Arizona, progress has been made through policies and programs that support asthma management, but gaps remain in both environmental safety and equitable access to care. In schools, Arizona has met more than half of the Asthma and Allergy Foundation of America (AAFA) core policy standards for medication and treatment, awareness, and school environment (Exhibit 23). It has yet to meet eight of the thirteen core policy standards in the school environment category. These missing standards include limits on school bus idling time, prohibiting all smoking and vaping in schools, and the requirement for tobacco-use prevention in the health education curriculum. Likewise, Arizona does not require schools to have emergency protocols for asthma and does not require schools to update and maintain health histories for students with chronic illnesses including asthma. It also does not require schools to develop a plan for remediating mold in school buildings, to use integrated pest management (IPM) techniques or limit pesticide use inside and outside of schools and does not implement a cleaning program that supports healthy indoor air quality. **Arizona has made progress in asthma-related public health standards and has an opportunity to strive to fully align with the *Honor Roll* criteria.**[12]

Exhibit 23. 2025 State of Honor Roll of Asthma and Allergy Policies for Schools[13]

Medication and Treatment Policies	Meets standard
Requires schools to have medication administration policies for school personnel to give prescription medication to students.	✓
Policy ensures students' right to self-carry and self-administer prescribed asthma medication.	✓
Policy ensures students' right to self-carry and self-administer prescribed anaphylaxis medication.	✓
Policy protects school personnel from liability for unintended injuries related to medication administration.	✓
Requires anaphylaxis medicine – epinephrine – stocking and authority to administer in schools.	
Allows and/or requires asthma quick-relief medicine stocking and authority to administer in schools.	✓
Requires schools to update and maintain records/health histories for identified students with chronic conditions including asthma and anaphylaxis.	

[12] https://aafa.org/advocacy/state-honor-roll/arizona/
[13] https://aafa.org/advocacy/state-honor-roll/arizona/

Requires schools to maintain asthma/ allergy incident reports for reactions attacks and medications administered.	✓
Requires schools to have emergency protocols for asthma.	
Requires schools to have emergency protocols for anaphylaxis.	✓
Has adopted policy that each school will have at least 1 full-time nurse.	
Has adopted policies that address the development of comprehensive school-based health services.	
(ECS) Has or is preparing an explicit asthma program with policies procedures and resources for schools to manage students with asthma.	✓
(ECS) Has or is preparing an explicit anaphylaxis program with policies procedures and resources for schools to manage students with allergies.	✓
(ECS) Recommends each school stock at least 2 doses of easily administered epinephrine.	✓
(ECS) Provides funding for stock medications.	

Awareness Policies

Sponsors or provides funding for staff training in asthma awareness covering school asthma program/policy and procedures.	✓
Sponsors or provides funding for staff training for the prevention recognition and treatment of allergic reactions to food.	✓

School Environment Policies

Requires schools to have indoor air quality (IAQ) management policies.	✓
Makes funding or other resources such as training available for technical IAQ assistance to schools.	
Requires schools to inspect and maintain heating ventilation and air conditioning (HVAC) systems.	✓
Requires schools to develop a plan to identify sources of mold and if necessary a plan to clean and remediate mold and mold sources in public school buildings.	
Recommends standards and programs to promote IAQ for school construction and renovation.	✓
Requires schools to develop a cleaning program that promotes healthy IAQ.	
Requires schools to use integrated pest management (IPM) techniques including limiting use of pesticides inside schools and on school campuses.	
If pesticide use is necessary state requires schools to notify parents of upcoming pesticide applications.	✓
Limits school bus idling time and/or establishes proximity restrictions.	
Has implemented zero-emission school bus transition incentives or mandates.	✓

Prohibits all smoking and vaping in school buildings and on school grounds.
Prohibits all smoking and vaping on school buses and at school-related functions.
Requires tobacco-use and vaping prevention in health education curriculum.
(ECS) Requires school facility design and operation standards that address IAQ.
(ECS) Requires districts or schools to provide tobacco-use-cessation and e-cigarette-use-cessation services and resources to students.

*ECS = Extra Credit Standard

Other school related data that underscore these limitations include a statewide survey of school nurses and the Arizona School Health Needs Assessment. The findings from both the 2021 school nurse survey and the 2023 Arizona School Health Needs Assessment reinforce the need for a more coordinated, policy-driven approach to managing asthma in school settings. In October 2021, the School Nurses Organization of Arizona (SNOA) and the Arizona Department of Education's School Safety & Social Wellness Program (ADE) conducted a **statewide online survey of school nurses and health staff** to inform future training, better understand student health conditions, and assess COVID-19-related needs. The survey was promoted by both SNOA and ADE to reach health professionals serving in Arizona schools, including registered nurses (RNs), licensed practical nurses, and health aides.

The survey received 390 responses, nearly double the expected number, with 60% of respondents being RNs. Respondents represented all Arizona counties, though the majority worked in Maricopa County. Most worked full time at a single school, with 87% employed by public school districts, and primarily served elementary and middle schools. Survey questions focused on respondent background, professional development needs, common chronic health conditions among students, and pandemic-related concerns. **Asthma was ranked as the most frequently encountered chronic condition in school health offices across Arizona.[14]**

The Arizona School Health Needs Assessment from 2023[15] outlined key considerations for this chronic respiratory condition in children and adolescents (Exhibit 24). Addressing asthma in children and adolescents requires a comprehensive approach that integrates policy, education, environmental health, and equitable access to care across both home and school settings.

[14] https://www.azed.gov/sites/default/files/2022/01/10-20-21%20Draft%20SNOA%20SN%20Survey%20Results.pdf
[15] https://www.azdhs.gov/documents/topics/healthy-kids/school-health-needs-assessment.pdf

Exhibit 24. Key Considerations for Children and Adolescents with Asthma from the Arizona School Health Needs Assessment, 2023

Key Considerations for Asthma in Children and Adolescents: AZ School Health Needs Assessment	
	Asthma-related absenteeism is a leading cause of chronic school absence in the U.S.[16]
	CDC data shows higher asthma-related deaths in African American populations and females.[17]
	The pilot albuterol program in a school district in Tucson reduced asthma-related 9-1-1 calls by 20% and EMS transports by 40% (Gerald et al., 2016). Gerald et al. also found that 84% of students who experienced an asthma attack were able to return to their classrooms instead of having to be sent out for emergency services.
	The cost of a stock albuterol program in Arizona is $114 per year/per school, including overhead.[18] This cost is reasonable but still costly for schools.
	Absenteeism-related financial losses due to asthma and educational impacts aren't calculated locally.
	20%-70% of asthma cases remain undiagnosed, indicating a significant research gap (Aaron et al., 2018).

Stock Inhaler for Schools Program

Addressing childhood asthma is not just a local concern. Nationally, the CDC reports that 8.1% of children in schools in the United States suffer from asthma. According to the ADHS (2023), stock medication programs can be useful in acting during an emergency, such as an asthma attack, accidental ingestion of poison, or allergic reaction. Variation in stock medication includes albuterol for asthma, naloxone for overdoses, and epinephrine for allergic reactions.

In response to this, 15 U.S jurisdictions (14 states and D.C) have enacted laws permitting K-12 schools to voluntarily stock and administer albuterol inhalers to students experiencing respiratory distress. However, implementation is inconsistent. Many states offer permissive rather than mandatory laws, limited funding for medication, training, monitoring systems, or fidelity protocols. Arizona is recognized as

[16] https://www.cdc.gov/healthyschools/asthma/index.htm
[17] https://www.cdc.gov/asthma/most_recent_national_asthma_data.htm
[18] https://www.azasthma.org/Albuterol-Program-FAQs

a national leader in passing and implementing stock inhaler laws through county level approaches (Volerman et al., 2021).

Arizona passed House Bill 2208, becoming the 9th state to allow schools to stock albuterol inhalers in 2017. It is a comprehensive statute that covers school types, training frequency, use protocols, and legal protection for schools and staff (Lowe et al., 2021 and Lowe et al., 2022). After its passage, the state's first large-scale inhaler initiative, the Stock Inhaler for Schools Program, was launched. The program was developed in partnership with the University of Arizona, Banner University Medical Center – Tucson, and Thayer Medical Corporation (Arizona Asthma Coalition, 2018). Mercy C.A.R.E.S. awarded a grant to the AZ Asthma Coalition for the program to be implemented in schools. Schools were then allowed emergency access to albuterol sulfate via one albuterol inhaler and ten Thayer Lite Aire valved holding chambers.

Through the implementation of the Stock Inhaler for Schools Program, students can be provided with access to emergency asthma medication at a low cost, which was estimated to be $114 per year/per school. The program also helps ensure accessibility as its trainings are web-based and can be completed in less than an hour. The likelihood of students being sent to the ED due to an asthma attack decreases when the stock inhaler program is utilized.

Stock Inhaler for Schools Program 2024-2025

836 Schools Enrolled

- 611 schools serviced by Maricopa County Department of Public Health
- 225 schools in Pima County

Benefits to Schools

- Low cost
- Decreases school absenteeism
- Training is accessible
- Access to life-saving rescue medication for students

The local impact of the pilot program was significant and demonstrated feasibility of implementation. **In Tucson, Arizona, the pilot albuterol program produced a 20% reduction in asthma-related emergency 9-1-1 calls with a 40% reduction in emergency medical transports** (Gerald et al., 2016). Gerald et al. also found that **84% of students who experienced an asthma attack were able to return to their classrooms instead of having to be sent out for emergency services**. In 2021, the University of Arizona researched the effects of implementing a stock inhaler program in Pima County. In the 152 schools that were provided with a stock inhaler, there were 1,038 asthma-related events; 83.9% of students returned to class, and 15.6% were sent home. School health staff also reported high satisfaction, and all of the schools renewed for a second year. The program costs were $156 per school (Lowe et al., 2021).

The pilot site also showed low protocol compliance, with only 28% of inhaler events meeting the standardized dosage guidelines, due largely to inconsistent training and variability among staff, including unlicensed assistive personnel (UAPs) (Lowe et al., 2022).

In 2019, Maricopa County built upon Pima's experience by adopting a more structured and data-driven approach when it launched its program. Maricopa used a centralized School Surveillance Medication Program (SSMP) for enrollment and data tracking, and enforced standardized, web-based training with annual certification requirements. **The SSMP led to wider participation (300+ schools enrolled) and improved outcomes, with 78% of inhaler administration events meeting protocol compliance standards** (Lowe et al., 2025).

For the 2024-2025 school year, 836 schools have successfully enrolled in the Stock Inhaler for Schools Program, representing 119% of the 700 Arizona K-12 schools targeted. Six-hundred and eleven schools enrolled in the program in all other counties outside of Pima, serviced by the Maricopa County Department of Public Health, and 225 schools enrolled in the program in Pima County. Those counties outside of Pima reported a total of 1,252 stock inhaler events, and Pima County reported a total of 925 stock inhaler events based on data collected from the Maricopa County Department of Public Health (MCDPH) and the Pima County Health Department.[19]

Although Arizona is regarded as a national leader in establishing policy and its implementation of the program across the state, it faces barriers to expanding the Stock Inhalers for Schools Program across all schools in Arizona (Exhibit 25).

Exhibit 25. Potential Barriers to Expansion of the Arizona Stock Inhalers for Schools Program

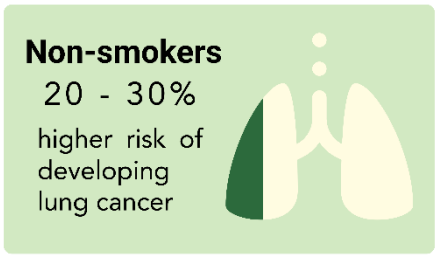
Potential Barriers to Program Expansion	
Administrative Burden	The enrollment process includes assigning a program lead, securing district-level approval, verifying training, and using the web-based School Surveillance Medication Program (SSMP) for documentation. **These steps can discourage participation, particularly in schools with limited administrative capacity** (Lowe et al., 2025).
Training	Many schools lack full-time nurses and rely on unlicensed assistive personnel (UAPs), whose training varies widely. **Limited workforce capacity and staff turnover require repeated training cycles, re-verification, and ongoing administrative oversight to ensure annual compliance** (Lowe et al., 2022).

[19] https://azasthma.org/school-stock-inhaler

Protocol Adherence	Even with a standardized protocol for administering albuterol, **compliance remains an issue amongst licensed and unlicensed personnel.** This is primarily due to dosing differences between the program's protocol and individualized asthma action plans. In high-stress situations, staff may also struggle to interpret symptoms of respiratory distress or apply training (Lowe et al., 2022).
Equity in Program Reach	**Smaller, rural, and tribal schools are less likely to participate, due to distance from county support centers, limited awareness, or digital access challenges**. Culturally tailored materials and multilingual resources are still needed to ensure equity (Volerman et al., 2021).
Sustainability	Initial program success relied heavily on grant funding (e.g., from Banner Health Foundation, Mercy C.A.R.E.S.). **Continued funding sources to support supplies, staffing, or technical support are not guaranteed** (Lowe et al., 2025).

Indoor Pollution

In addition to school-based interventions, the home and indoor environments play a critical role in asthma management, particularly in reducing exposure to harmful pollutants. One of the most well-documented and harmful indoor pollutants is secondhand smoke (SHS). According to the CDC, second-hand smoke (SHS) contains over 7,000 chemicals, including hundreds that are toxic and about 70 known to cause cancer.[20] Children exposed to SHS face an increased risk of frequent and severe asthma attacks, leading to more medical visits and potential long-term respiratory complications. Additionally, SHS exposure heightens the likelihood of acute respiratory infections, middle ear disease, and sudden infant death syndrome (SIDS), all of which can have lasting health effects[21].



For non-smoking adults, the dangers of SHS exposure are equally concerning. **Those regularly exposed face a 20%–30% higher risk of developing lung cancer, with over 7,300 non-smokers dying each year from SHS-related lung cancer**.[22] SHS is also linked to an increased likelihood of heart disease and stroke, further emphasizing the importance of smoke-free environments. Thirdhand smoke is the

[20] CDC - Fact Sheet - Health Effects of Secondhand Smoke - Smoking & Tobacco Use
[21] Health Problems Caused by Secondhand Smoke | Smoking and Tobacco Use | CDC
[22] https://www.lung.org/quit-smoking/smoking-facts/health-effects/secondhand-smoke

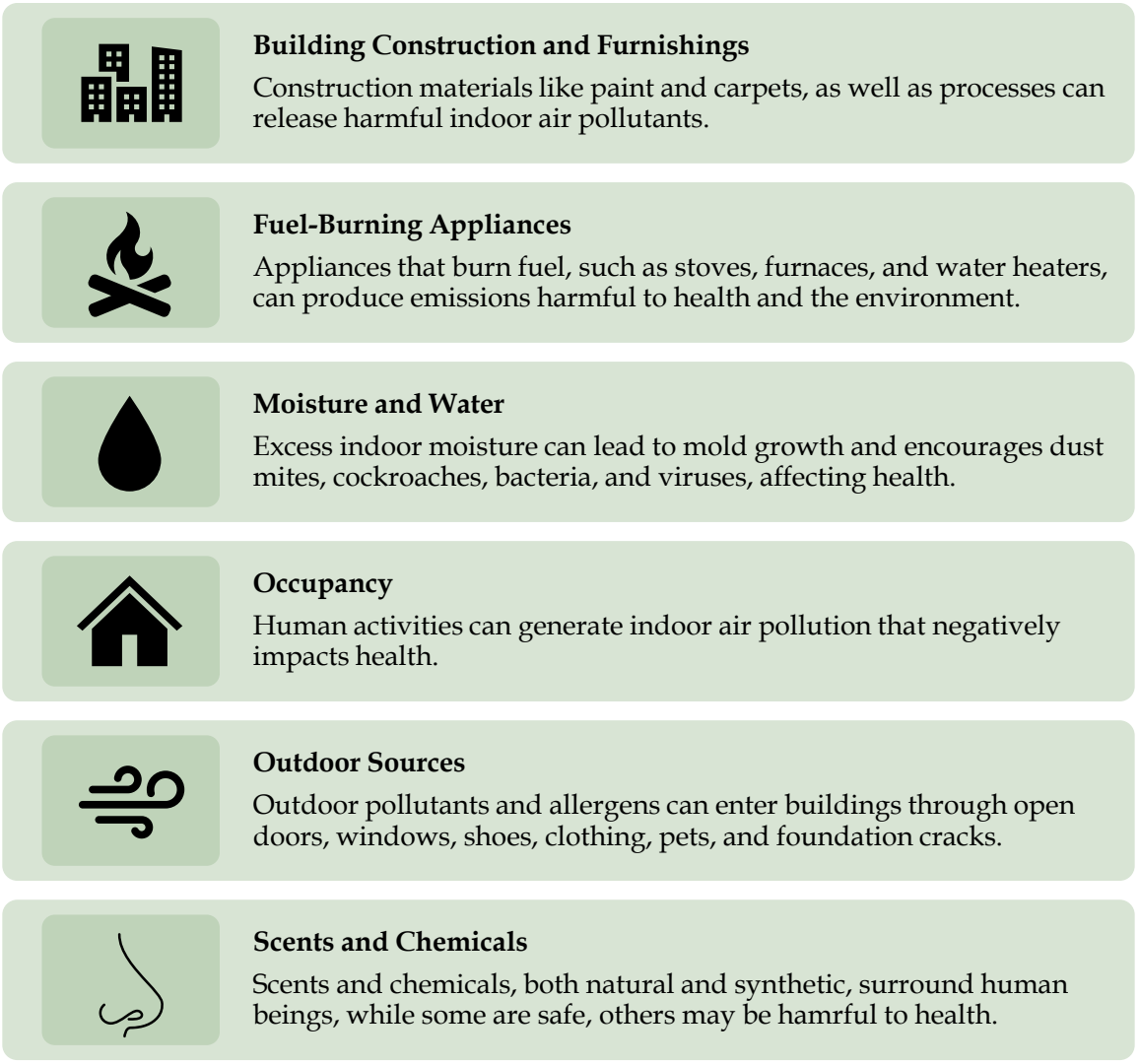
residual nicotine and toxins that linger on surfaces like walls and carpets and contributes to indoor air pollution. It can persist for weeks or months and poses ongoing health hazards.[23] Given these risks, creating smoke-free homes is essential to reducing asthma attacks, preventing respiratory illnesses, and minimizing the long-term health consequences associated with both secondhand and thirdhand smoke exposure.

In 2006, Arizona voters passed the **Smoke-Free Arizona Act**[24], a citizen-led initiative prohibiting smoking in most enclosed public places and workplaces. This law marked a significant milestone in reducing SHS exposure at the population level. However, SHS exposure remains a concern in private settings, particularly in multi-unit housing, homes, and childcare environments.

[23] CDC - Fact Sheet - Health Effects of Secondhand Smoke - Smoking & Tobacco Use
[24] https://www.azdhs.gov/documents/preparedness/epidemiology-disease-control/smoke-free-arizona/reports/sfa-annual-report-2024.pdf

Beyond tobacco-related pollution, indoor air can be compromised by mold, household chemicals, pet dander, dust mites, gas stoves, inadequate ventilation, and outdoor pollutants that infiltrate buildings. According to the American Lung Association[25], poor indoor air quality can aggravate asthma and other chronic respiratory conditions, especially among children, older adults, and individuals living in under-resourced or overcrowded housing (Exhibit 26).

Exhibit 26. Factors Contributing to Poor Indoor Air Quality[26]



While Arizona has made progress in asthma policy and programs, **indoor air quality and home-based exposure prevention education** remain areas for improvement. Strengthening public awareness about indoor air pollutants, expanding smoke-free housing initiatives, and supporting families in creating healthier home environments

[25] What Makes Indoor Air Unhealthy? | American Lung Association
[26] https://www.lung.org/clean-air/indoor-air/indoor-air-pollutants

are essential to reducing asthma disparities. These efforts must also include culturally tailored outreach and practical guidance for mitigating environmental triggers in diverse household settings. The continued success of programs like the Stock Inhaler for Schools Program demonstrates that effective solutions are within reach. However, **achieving a comprehensive approach that addresses both environmental and behavioral factors, such as SHS exposure in homes, is essential for reducing asthma-related health disparities and improving the quality of life for children and adults alike.**

Environmental Factors

Air Quality Data

According to the United States Environmental Protection Agency (EPA), air pollution is any visible or invisible particle or gas found in the air that is not part of the natural composition of air (AAFA, n.d.). Air quality data refers to the information collected about the levels of pollutants present in the air, providing valuable insight into the cleanliness or pollution levels of a specific area. In Arizona, the collection of air quality data dates to the 1970s; however, 1980 marks the beginning of nationally consistent operational and quality assurance procedures for air quality monitoring, particularly for ozone.[27] Currently, this data is being collected, and it is crucial as it allows for the identification of pollution trends, the prediction of unhealthy air conditions, and the implementation of appropriate public health measures. Poor air quality directly impacts the population, particularly individuals with respiratory conditions such as asthma, which is increasingly prevalent in the state. **Exposure to environmental pollutants like ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), industrial pollutants, and allergens can exacerbate asthma symptoms and contribute to the rising rates of respiratory illnesses.[28]**

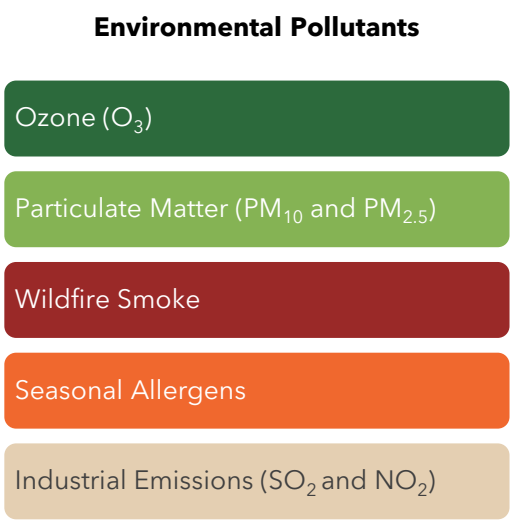
According to EPA's official area designations, much of Arizona struggles to meet national air quality standards. Maricopa County and parts of Gila County and Pinal County are classified as "moderate nonattainment" areas for the 8-hour ozone standard. In addition, Maricopa and Pinal County are designated "serious nonattainment" areas for particulate matters (PM_{10}).[29] These nonattainment designations indicate pollution levels exceed the threshold set by the National Ambient Air Quality Standards (NAAQS), which are established to protect public health. The basis for these designations includes long-term monitoring data that shows persistent pollution problems in these regions. The American Lung Association's 2024 *State of the*

[27] https://www.epa.gov/ground-level-ozone-pollution/health-effects-ozone-pollution
[28] https://aafa.org/asthma/asthma-triggers-causes/air-pollution-smog-asthma/
[29] https://www3.epa.gov/airquality/urbanair/sipstatus/reports/az_areabypoll.html

Air report, using EPA data reinforces these concerns by assigning a grade of "F" for ozone pollution in Maricopa, Gila, Pinal, and Pima Counties, and an "F" for particulate pollution in Maricopa and Pinal Counties.[30] **These poor grades highlight the widespread nature of air quality issues in Arizona and timely air quality forecasts are essential in helping the public understand these risks and take preventive measures.** It is important to understand and take a closer look at the specific pollutants and how their levels are forecasted to provide further insight into managing their health risks, particularly as they relate to the growing prevalence of asthma.

Environmental Pollutants

Air quality is heavily influenced by several environmental pollutants, each of which can significantly affect public health, particularly for individuals with asthma. These pollutants may trigger asthma episodes, affect children's lungs development, and can even be deadly. The most common ones are ozone, particulate matter, nitrogen dioxide, sulfur dioxide, and other pollutants.[31]



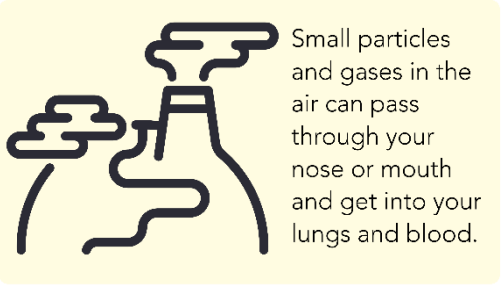
One of the most common is ozone (O_3), a pollutant formed when sunlight reacts with emissions from vehicles, power plants, and industrial sources. [32] While beneficial in the upper atmosphere, ozone at ground level becomes harmful, particularly during warmer months in urban areas with high levels of traffic.[33] According to the American Lung Association, this makes sunny regions like Arizona especially vulnerable. **For people with asthma, exposure to O_3 can inflame the airways, triggering symptoms such as wheezing, coughing, and shortness of breath.**[34] In Phoenix, where intense sunlight and vehicle emissions are prevalent, ozone levels tend to rise, making it especially important for residents to be aware of air quality conditions.

Another major pollutant affecting people with asthma is particulate matter, specifically PM_{10} and $PM_{2.5}$. These small airborne particles can easily be inhaled into the lungs, causing irritation and triggering asthma symptoms. $PM_{2.5}$, the finer of the two, can

[30] https://www.lung.org/research/sota/city-rankings/states/arizona
[31] https://www.lung.org/clean-air/outdoors
[32] https://www.epa.gov/ground-level-ozone-pollution/ground-level-ozone-basics
[33] Ibid
[34] https://www.epa.gov/ground-level-ozone-pollution/health-effects-ozone-pollution

penetrate even deeper into the respiratory system, posing more severe risks as they can go deep into the lungs or even the blood.[35] **In Arizona, particulate matter is often associated with dust storms, vehicle emissions, wood smoke, fireworks, and industrial activities. During times of high pollution, these particles can exacerbate asthma attacks and contribute to worsening lung function.** The American Lung Association notes that particle pollution can be deadly, contributing not only to asthma but also to heart attacks, strokes, and even premature death, especially for vulnerable populations such as children, older adults, and people with chronic diseases.[36]

Wildfire smoke is another significant contributor to poor air quality in Arizona, especially in regions prone to fires. The smoke from wildfires contains a mix of particulate matter and toxic gases, both of which can trigger asthma symptoms and worsen existing respiratory conditions. With the increasing frequency and intensity of wildfires, particularly in the dry summer months, wildfire smoke has become a growing concern. **For those with asthma, exposure to this smoke can lead to increased difficulty breathing, coughing, and other health complications.**



Other environmental pollutants like industrial emissions and allergens also contribute to the growing problem of asthma. Emissions from factories, power plants, and refineries can release harmful chemicals into the air, such as sulfur dioxide (SO_2) and nitrogen dioxide (NO_2), which irritate the lungs and worsen asthma symptoms. Seasonal allergens, including pollen, mold, and pet dander, also play a role in asthma attacks, especially during certain times of the year.[37] In Arizona, dust storms and pollen from local vegetation further contribute to the challenge, particularly for people already susceptible to respiratory issues. Also, **communities near industrial zones and high-traffic areas often bear a disproportionate burden of exposure to air pollution, which can worsen health disparities.[38]**

Understanding the link between air quality and asthma is essential, especially in Arizona, where high levels of pollution are common in urban and rural areas alike. This makes it crucial to keep the population informed about air quality trends. For example,

[35] https://aafa.org/asthma/asthma-triggers-causes/air-pollution-smog-asthma/
[36] https://www.lung.org/research/sota/air-quality-facts
[37] Ibid
[38] Su, J. G., Aslebagh, S., Vuong, V., Shahriary, E., Yakutis, E., Sage, E., Haile, R., Balmes, J., Jerrett, M., & Barrett, M. (2024). Examining air pollution exposure dynamics in disadvantaged communities through high-resolution mapping. *Science advances*, *10*(32), eadm9986. https://doi.org/10.1126/sciadv.adm9986

organizations like the American Lung Association issue an annual report card for all cities and counties, using air quality data collected on pollutants such as ozone and particle pollution.[39] This, alongside other ways of air quality monitoring data, has become a vital tool in tracking these trends, helping to highlight areas where the population is most at risk.

Forecast Data

The Arizona Department of Environmental Quality[40] (ADEQ) has taken steps to monitor air quality and protect public health. The department plays a vital role in safeguarding public health by issuing air quality forecasts for pollutants such as O_3, PM_{10}, and $PM_{2.5}$, as well as dust, lead, and wildfire smoke. **The ADEQ forecasts are an essential resource for informing the public about potential air quality conditions that could trigger asthma episodes or other health concerns.** ADEQ provides detailed forecasts for different counties and regions across the state (Networks are Phoenix, Tucson, Yuma, and Western Pinal), including pollutant levels and potential weather impacts like blowing dust or rain. The community can subscribe and receive emails with information regarding forecast Monday through Friday. Subscribers also have the option to receive daily text messages in addition to email. **These forecasts also include recommendations on which air quality flag to display each day,** as part of ADEQ's Air Quality Flag Program– a public awareness initiative that uses colored flags to signal daily pollution levels and promote actions to reduce exposure, especially for individuals with asthma. A**nyone can subscribe to receive daily air quality forecast updates via email or SMS**.[41,42]

In addition to the daily air quality updates, the public benefits from specific health and safety recommendations. The wildfire smoke section, for example, details the expected impact on air quality, when and where smoke may affect particular areas, and outlines associated health risks. It also provides links to additional resources for further guidance on how to stay safe during wildfire smoke events.[43]

These resources are crucial for individuals with asthma as they provide early warnings about unhealthy air conditions, enabling people to take preventive measures such as staying indoors or limiting physical activity. By offering access to this critical information, the state is helping residents manage the health risks associated with pollution. **As the issue of air quality continues to affect the population, the role of**

[39] https://www.lung.org/research/sota/city-rankings/states/arizona
[40] About Us | ADEQ
[41] https://www.azdeq.gov/FlagProgram
[42] https://azdeq.gov/forecast
[43] Ibid

forecast data in preventing asthma attacks and promoting public health becomes even more important.

Tobacco Use

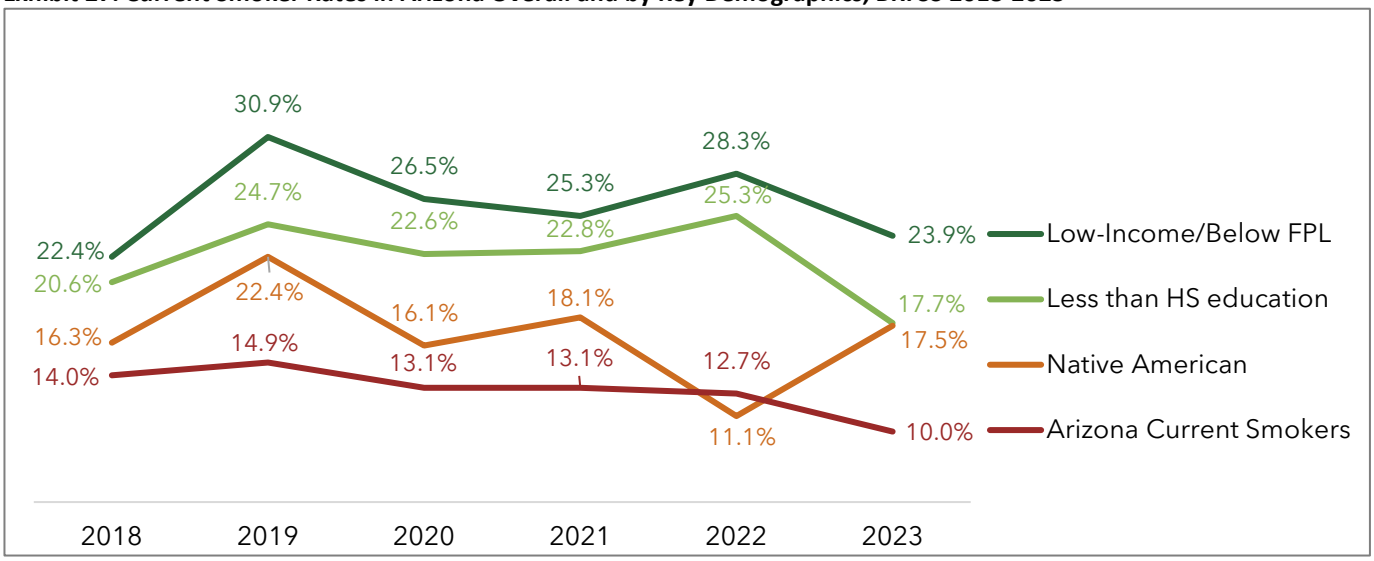
Tobacco use, encompassing both traditional smoking and the use of electronic nicotine products such as e-cigarettes, has profound implications for asthma rates in Arizona. While the state has made progress in reducing adult smoking, the rise in youth vaping may present new challenges to respiratory health. Understanding the impact of tobacco use on asthma is crucial for developing effective public health strategies. Exposure to tobacco smoke and e-cigarette aerosols can irritate the airways, leading to asthma development or exacerbation. Both smoking and vaping contribute to respiratory issues, making it crucial for individuals with asthma to be vigilant about tobacco exposure.

Adult Tobacco Use

In Arizona, adult smoking rates have declined over the past 10 years to the extent that there are slightly more adults in Arizona who identified as *former* smokers in 2020 (26%) than in 2015 (25%).[44] Longitudinally, adult current smoking rates have largely decreased. According to Behavioral Risk Factor Surveillance System (BRFSS) (BRFSS) data, the rates of adults who currently smoke dropped from 19.3% in 2011 to 10% in 2023, reflecting **a 48% decrease in current smoker rates over the past 12 years.** However, disparities exist amongst certain groups. For instance, populations in Arizona with higher rates of tobacco use include those with less than a high school education (17.7% current smoker rate), Native Americans (17.4%), and those living below the federal poverty level (23.9%) (Exhibit 27).

[44] Arizona Tobacco Control Program Five-Year Strategic Plan 2022-2026.

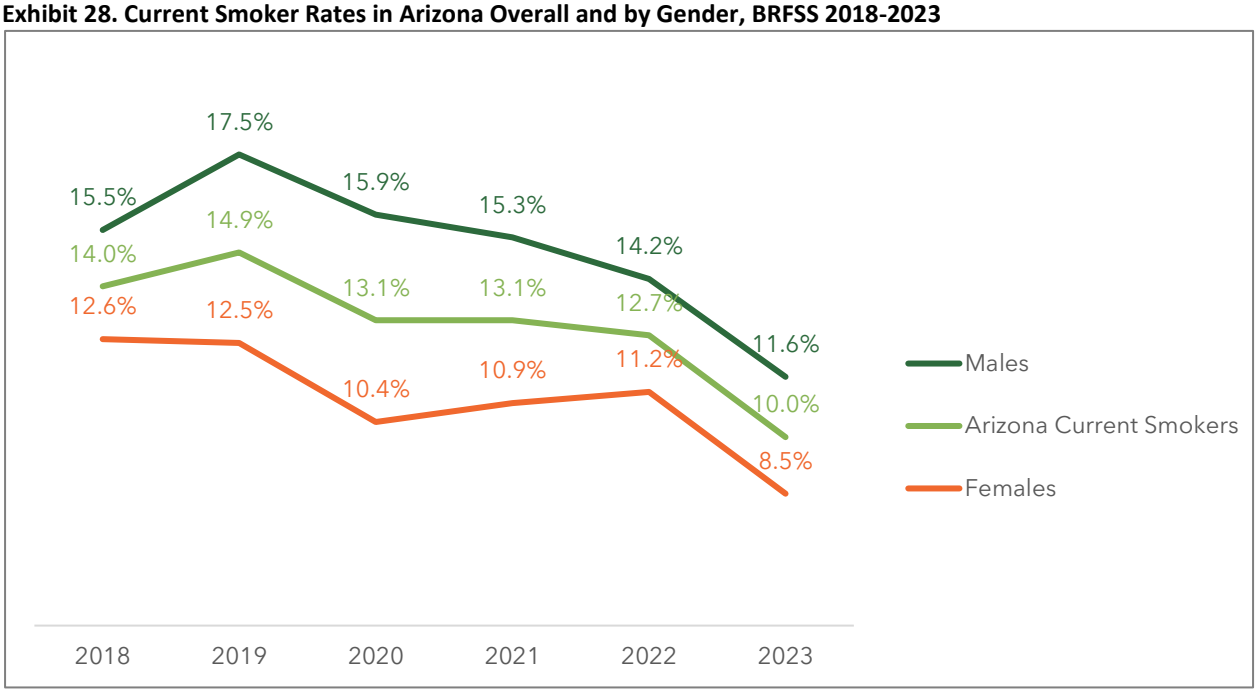
Exhibit 27. Current Smoker Rates in Arizona Overall and by Key Demographics, BRFSS 2018-2023



Source: Centers for Disease Control and Prevention (CDC), National Center for Chronic Disease Prevention and Health Promotion, Division of Population Health. (2023). *BRFSS Prevalence & Trends Data*. https://www.cdc.gov/brfss/brfssprevalence/.

Additionally, adult males are more likely to identify as current smokers, compared to females, even as overall prevalence decreases over time (Exhibit 28).

Exhibit 28. Current Smoker Rates in Arizona Overall and by Gender, BRFSS 2018-2023



Source: CDC, 2023. *BRFSS Prevalence & Trends Data*. https://www.cdc.gov/brfss/brfssprevalence/.

BRFSS data also shows an increase in adult e-cigarette use, which rose from 5.3% in 2016 to 9.0% in 2022 (Exhibit 29). Interestingly, an increase in adult e-cigarette use from 2021 to 2022 corresponds with a decrease in the current adult smoker rate (see Exhibits

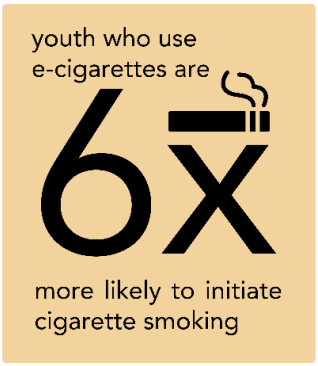
28 and 29). This suggests that some adult users may be transitioning from traditional smoking to vapor products. However, **Arizona adults smoke cigarettes at higher rates than high school students, who use EVPs at more than three times the rate of adults**. While Arizona has made progress in reducing adult smoking rates, the rise in e-cigarette use among youth presents a new public health challenge.

Exhibit 29. Current E-Cigarette User Rate for Arizona Adults, 2016-2022, BRFSS

	2016	2017	2021	2022	Change
Current E-Cigarette User (Adults)	5.3%	5.3%	8.8%	9.0%	↑

Source: CDC, 2023. *BRFSS Prevalence & Trends Data.* https://www.cdc.gov/brfss/brfssprevalence/.

Youth Tobacco Use



The increasing popularity of e-cigarettes among youth is a notable reality (Fadus, 2019). Youth who use e-cigarettes are six times more likely to initiate cigarette smoking compared to non-users (Barrington-Trimis et al., 2016). This progression from electronic vapor product (EVP) use to smoking may exacerbate public health challenges, particularly concerning asthma rates among youth.

ADHS presented the results of the Youth Risk Behavior Survey from 2015-2021, including smoking and vaping rates and factors related to use among Arizona teens. ADHS specified cigarette smoking and EVP use among Arizona teens in grades 9-12 as a public health concern. In Arizona, teen cigarette smoking has been decreasing over the past decade (10.1% in 2015 to 3.4% in 2021), but EVP use has remained higher. In 2021, 17.2% of Arizona youth reported current EVP use. Gender and race/ethnicity disparities are notable. Female youths reported higher use than males (21.1% vs. 13.3%). White high school youth (20.5%) were significantly more likely than Black high school youth (7.6%) to report current EVP use in 2021. From 2015 to 2021 there have been significant reductions in EVP use among all racial and ethnic groups (Exhibit 30).

Exhibit 30. Arizona High School Youth Risk Behavior Survey Tobacco Use Data, 2015-2021

	2015	2017	2019	2021	Change
Currently Smoked Cigarettes (in past 30 days)	10.1%	7.1%	5.3%	3.4%	↓
Currently Used Electronic Vapor Products (in past 30 days)	27.5%	16.1%	17.9%	17.2%	↓
Current EVP Use by Gender					
Males	29.4%	18.9%	18.9%	13.3%	↓
Females	25.4%	13.1%	17.1%	21.1%	↑
Current EVP Use by Race/Ethnicity					
Native American	N/A	30.4%	9.8%	N/A	N/A
Black	19.2%	14.7%	15.9%	7.6%	↓
Hispanic	26.7%	13.2%	16.0%	15.0%	↓
White	29.8%	21.7%	22.6%	20.5%	↓
Multiple Race	29.4%	13.3%	11.3%	24.4%	↑

Note: N/A indicates that the data was suppressed because there were less than 30 respondents for this subgroup.
Source: CDC, 2023. 1991-2021 High School Youth Risk Behavior Survey Data. http://nccd.cdc.gov/youthonline/.

The Arizona Youth Survey (AYS) is administered every two years to a statewide sample of 8th, 10th, and 12th grade youth representing all 15 Arizona Counties 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. 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[45]. **The AYS data shows youth e-cigarette use (lifetime and past 30 days) remains higher than youth cigarette use across all grades (8th, 10th, and 12th). E-cigarette use** rose sharply in 2018 and has since **declined across all grades**. Older students (12th graders) consistently show higher use rates than younger students (Exhibit 31 and Exhibit 32).

[45] azcjc.gov/Programs/Data-Integration-Analytics-Optimization/Statistical-Analysis-Center/Arizona-Youth-Survey

Exhibit 31. Youth Lifetime Tobacco Use by Grade, 2016-2024, Arizona Youth Survey

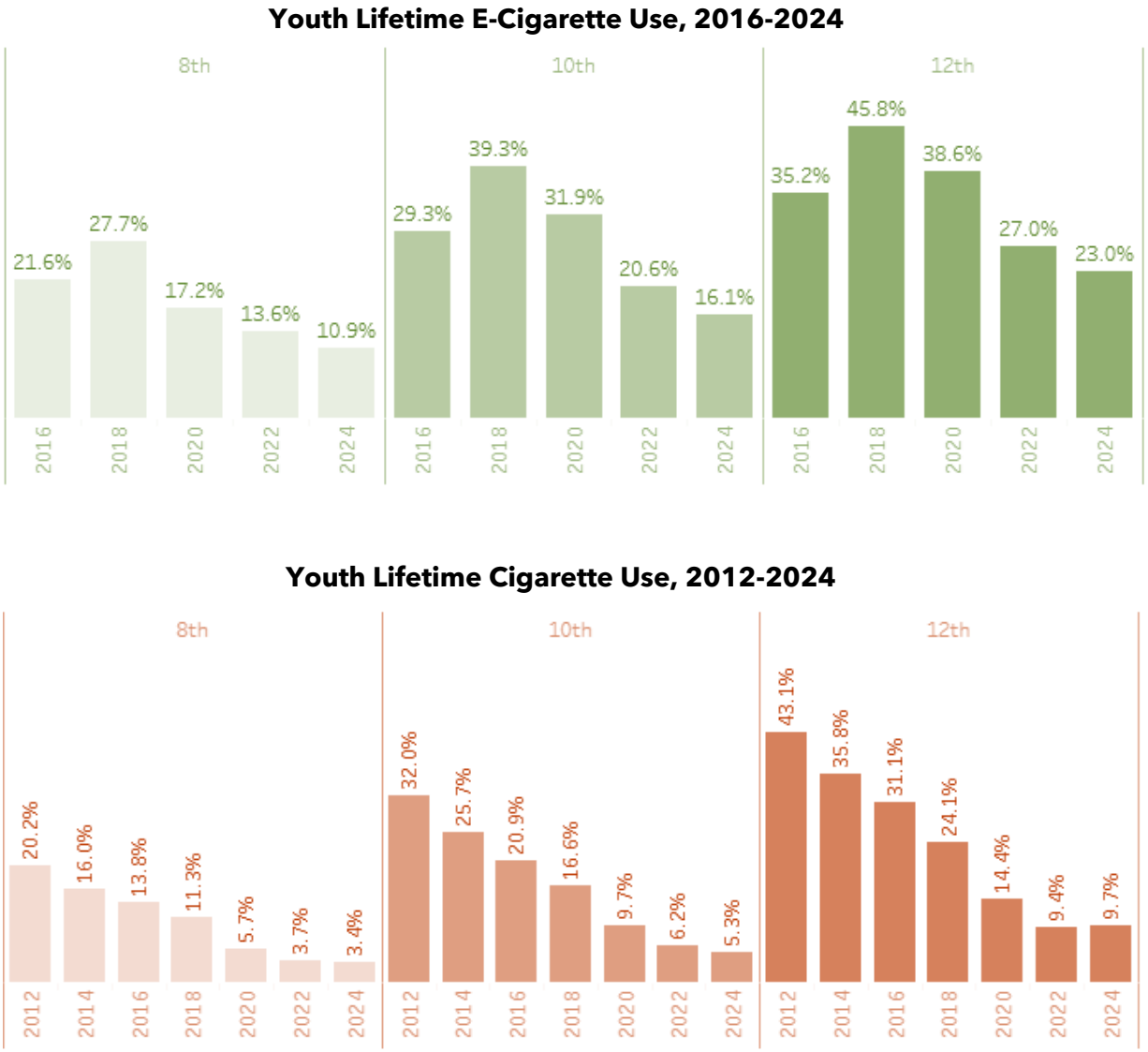
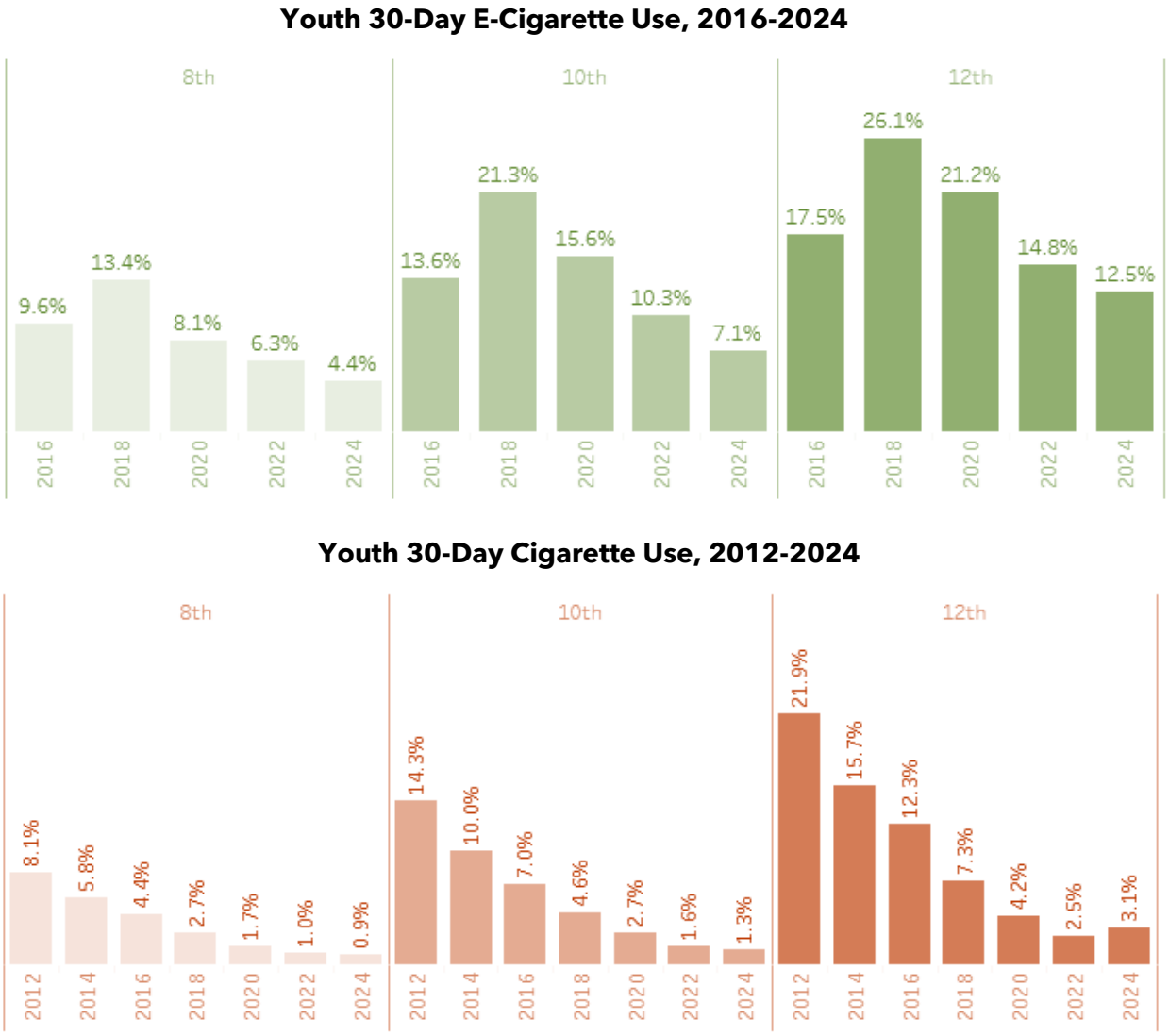


Exhibit 32. Youth 30-Day Tobacco Use by Grade, 2016-2024, Arizona Youth Survey

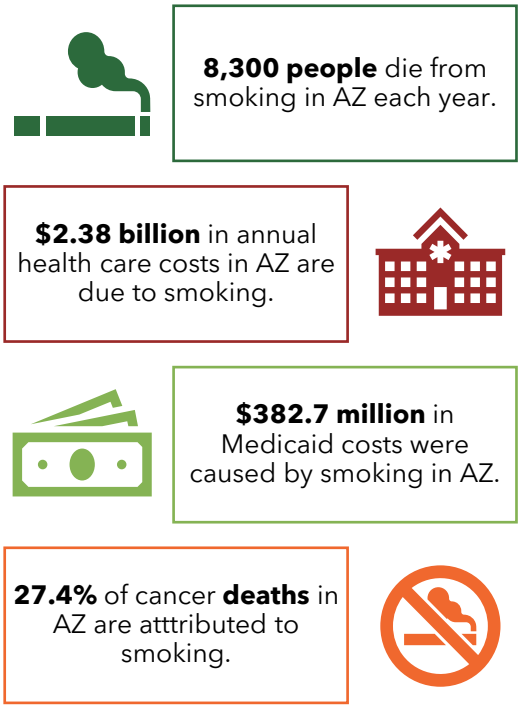


Source: https://www.azcjc.gov/Data/Arizona-Youth-Survey/Substance-Use

A related concern is access to EVP. More than half of teens (52%) who are using an EVP are getting it from their friends and family, as the legal federal minimum age to purchase tobacco and EVP products is 21. Most importantly, ADHS reported that **1 in 2 Arizona teens who currently use an EVP are trying to quit,** and that having a caring adult to talk to will improve their chances of quitting. These observations highlight an opportunity for public health intervention to support teens who are trying to quit EVP use.

In response to these challenges, ADHS has developed the **Arizona Tobacco Control Program (ATCP) Five-Year Strategic Plan (2022-2026).** ATCP's guiding principles include *Community*, *Commitment*, *Collaboration*, *Coordination*, and *Comprehensive*.

The strategic plan outlines goals and strategies to guide commercial tobacco prevention and control across the state. The ATCP strategic plan aims to prevent tobacco-related diseases, including respiratory conditions like asthma, by reducing smoking rates in youth and adults and exposure to secondhand smoke. It focuses on strategies such as prevention, cessation support, and policy changes to reduce tobacco consumption, while also working to eliminate the disproportionate impacts tobacco has on vulnerable populations. By focusing on these areas, Arizona aims to reduce tobacco-related health disparities and protect residents from the harmful effects of tobacco exposure, including asthma.

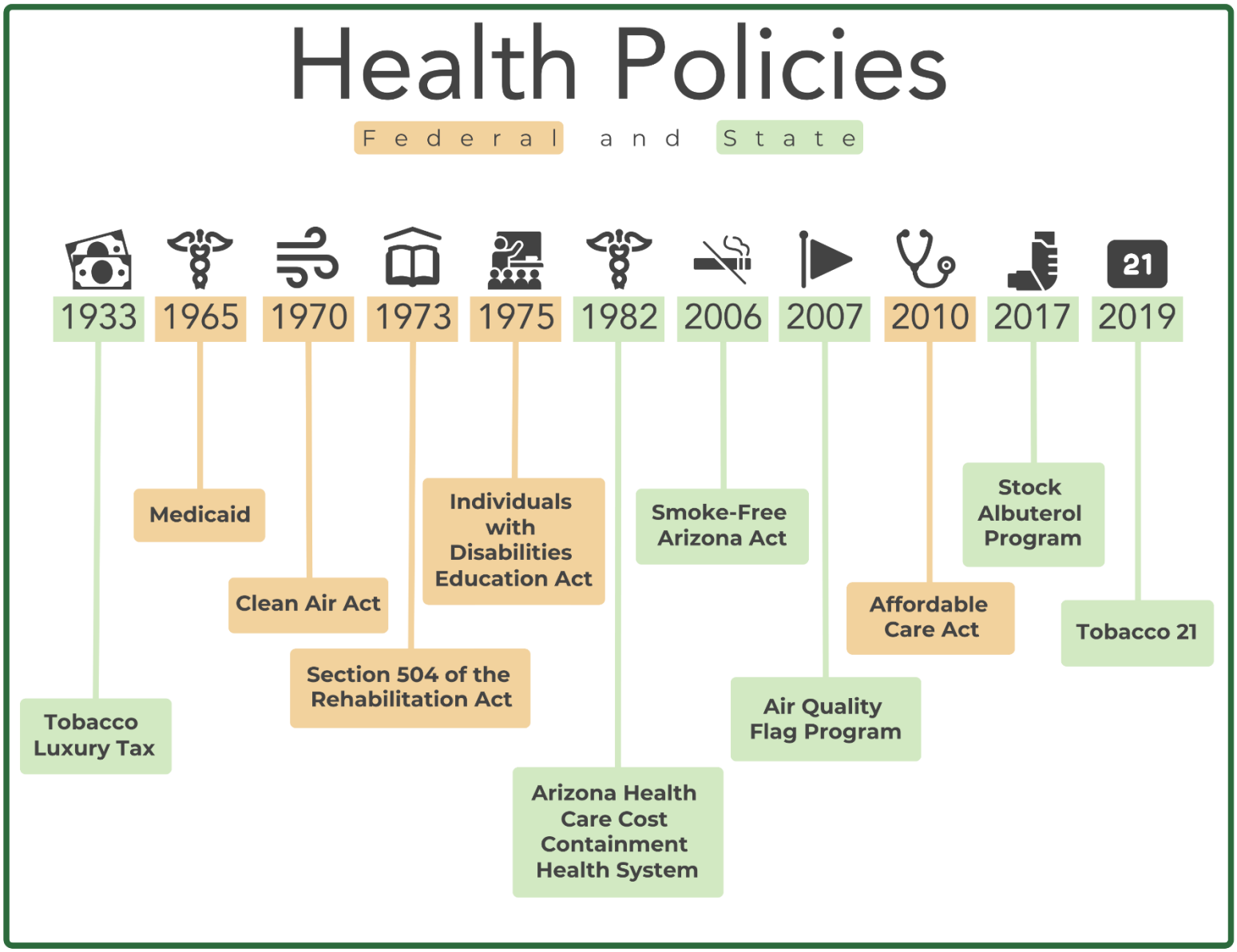


Tobacco use continues to play a significant role in the state's asthma rates, contributing to the prevalence and exacerbation of the condition. Other relevant considerations from the ATCP strategic plan are tobacco-related health care costs and smoking related mortality. **Addressing both smoking and vaping through comprehensive strategies, as outlined in the ATCP's Strategic Plan, are essential for improving respiratory health and preventing asthma-related complications for future generations.**

Health Policy

Health policies at both the federal and state levels play a fundamental role in addressing asthma and improving the overall health of individuals affected by this chronic respiratory condition (Exhibit 33). Federal initiatives, such as the Clean Air Act (CAA) in 1955 and the Affordable Care Act (ACA) in 2010, set broad national standards and provide essential healthcare coverage, while state-level policies and programs allow for more localized and tailored approaches to manage asthma. In Arizona, state policies such as the Arizona Health Care Cost Containment System (AHCCCS) (1982), the Smoke-Free Arizona Act (2006), and the Stock Inhaler Program (2017) are designed to enhance healthcare access, reduce exposure to environmental asthma triggers, and ensure that individuals have the resources and support needed to effectively manage their condition**. Together, these federal and state policies work in tandem to address the multiple factors contributing to asthma and improve the quality of life of those affected.**

Exhibit 33. Federal and State Health Policies Addressing Asthma, 1933-2019



Federal Policies

At the federal level, policies addressing asthma are often shaped by national health priorities and guided by agencies such as the U.S. Environmental Protection Agency (EPA) and the CDC. The federal government plays a crucial role in setting broad, nationwide standards for air quality, public health funding, and healthcare access. These policies are designed to protect the general population from environmental hazards, with a particular focus on vulnerable groups, including individuals with asthma. Federal initiatives often provide the framework for state and local governments to implement more targeted interventions. While the effectiveness of these policies is typically evaluated through large-scale health data, their **direct link to asthma prevalence is evident through efforts to reduce environmental pollutants and improve air quality, which can directly reduce asthma attacks and improve health outcomes.**

Medicaid

Medicaid is a joint federal and state program signed into law in 1965 to provide health coverage to eligible low-income individuals, including children, pregnant women, elderly adults, and people with disabilities.[46] **Medicaid is essential for asthma management, as it covers necessary services such as doctor visits, medications, and hospitalizations. This program helps ensure that individuals from low-income households can access vital healthcare resources to manage their condition.** According to an analysis by the American Lung Association Epidemiology and Statistics Unit**, individuals insured by Medicaid had the highest asthma rate in 2022 (Medicaid: 11.3%, Private: 7.6%, Uninsured: 5.3%).**[47] Medicaid's role in providing access to asthma treatments is to reduce health disparities and ensure that low-income populations can receive the care they need to avoid asthma exacerbations and improve quality of life. However, coverage remains inconsistent across programs and challenges to access remain (Link et al., 2023).

Clean Air Act

The Clean Air Act (CAA) is a federal law that regulates air emissions from both stationery and mobile sources, with the goal of improving air quality and protecting public health.[48] Enacted in 1970, it set national standards for air quality and authorized the EPA to enforce these standards.[49] The CAA was designed to address various pollution problems, including those affecting respiratory health. Air pollution—

[46] https://www.medicaid.gov/about-us/program-history
[47] https://www.lung.org/research/trends-in-lung-disease/asthma-trends-brief/current-demographics
[48] https://www.epa.gov/laws-regulations/summary-clean-air-act
[49] https://www.congress.gov/crs-product/RL30853

especially particulate matter and ozone—has been shown to exacerbate asthma, particularly in children and vulnerable populations (Ross et al., 2012). **By reducing harmful emissions, the CAA plays a vital role in mitigating asthma exacerbations and improving the air quality that individuals with asthma are exposed to**. While the CAA has achieved significant progress, like dramatically reducing vehicle-related pollutants (Ross et al., 2012), ongoing air quality monitoring and stricter emissions regulations could help further reduce asthma-related complications. More emphasis on urban and industrial areas with high asthma rates could also be beneficial.

Section 504 of the Rehabilitation Act

Section 504 of the Rehabilitation Act, passed in 1973, prohibits discrimination based on disability in programs and activities receiving federal financial assistance.[50] It ensures that individuals with disabilities, including children with chronic conditions like asthma, have equal access to public services, including education**. For students with asthma, Section 504 ensures that schools provide necessary accommodations, such as medication access and adjustments to school routines that could trigger asthma attacks** (U.S. Department of Education, Office for Civil Rights, 2024).

Individuals with Disabilities Education Act

Passed in 1975, the Individuals with Disabilities Education Act (IDEA), ensures that children with disabilities receive free and appropriate public education, including necessary special education and related services.[51] IDEA mandates that schools provide individualized education programs (IEPs) tailored to each student's unique needs, including those with chronic health conditions like asthma. While asthma is not specifically mentioned in the law, students with asthma can receive accommodations to help manage their condition, such as permission to use inhalers during school or adjustments to school activities to prevent asthma triggers. **IDEA's focus on ensuring equal access to education benefits students with asthma by addressing health-related barriers to learning** (U.S. Department of Education, Office for Civil Rights, 2024). However, the degree of support may vary, and some students may not receive sufficient asthma management accommodation. Ensuring that all staff members are trained in asthma management could help prevent incidents where students experience asthma attacks due to lack of awareness or preparedness.

Affordable Care Act

The ACA, signed into law in 2010, aimed to reduce the number of uninsured Americans and lower healthcare costs through various reforms, including expanding Medicaid and

[50] https://www.ed.gov/laws-and-policy/individuals-disabilities/section-504
[51] https://www.ed.gov/laws-and-policy/individuals-disabilities/idea

establishing health insurance exchanges.[52] **For individuals with asthma, the ACA provides crucial benefits such as expanded access to health insurance coverage and the elimination of pre-existing condition exclusions.** With insurance coverage, people with asthma can access essential treatments, including medication and asthma management services, which are vital for controlling this condition. The ACA has led to improved asthma management for many adults, particularly those from lower socioeconomic backgrounds, although challenges remain in reducing financial barriers to care (Suri et al., 2022).

Tobacco 21

The Tobacco 21 legislation was signed into law in 2019, raising the federal minimum legal age to purchase tobacco products from 18 to 21.[53] This policy was designed to reduce early tobacco use and it holds significant public health implications. For individuals with asthma, the law carries particular importance, as both tobacco use and SHS can worsen asthma symptoms, trigger attacks, and increase the risk of hospitalization. **By reducing access among youth, Tobacco 21 has the potential to lower asthma-related complications and improve long-term respiratory health outcomes.** However, the law's effectiveness depends on consistent enforcement, community education, and access to cessation resources. Strengthening local compliance efforts, restricting online sales, increasing awareness through targeted outreach, and ensuring equitable access to support services can further amplify the impact of Tobacco 21—especially in communities disproportionately affected by tobacco-related harm.[54]

In 2025, the American Lung Association urged the federal government to take decisive action to reduce tobacco-related illness and death, outlining five key priorities. These priorities include: maintaining funding for the CDC's Office on Smoking and Health to continue youth prevention campaigns; protecting Medicaid access to ensure smoking cessation treatments for high-risk populations; removing illegal tobacco products from the market through stronger FDA enforcement and new user fees for e-cigarette manufacturers; finalizing "track and trace" regulations to curb illicit tobacco trade; and expanding cessation treatment options, especially for youth.[55]

Arizona State Policies

On the state level, policies are tailored to address the unique needs and challenges faced by local populations. State governments may have more flexibility to implement

[52] https://www.hhs.gov/healthcare/about-the-aca/index.html
[53] https://www.fda.gov/tobacco-products/retail-sales-tobacco-products/tobacco-21
[54] https://www.lung.org/policy-advocacy/tobacco/prevention/tobacco-21-laws
[55] https://www.lung.org/research/sotc/federal-grades/highlights

targeted programs and regulations that consider specific regional health risks, environmental factors, and demographic considerations. **In Arizona, state policies related to air quality, tobacco use, and healthcare access play a direct role in managing asthma prevalence**. Unlike federal policies, state initiatives can be more responsive to immediate public health needs, with a focus on specific communities and localized solutions. The effectiveness of these policies is closely tied to the state's ability to monitor air quality, provide resources for asthma management, and enforce regulations that reduce environmental pollutants known to trigger asthma attacks.

Tobacco Luxury Tax

The Tobacco Luxury Tax was first enacted in 1933 and has undergone several changes, with the most recent increase implemented in 2006.[56] This last change raised the tax rate from $1.18 to $2.00 per pack of cigarettes. **This tax is designed not only to generate revenue but to discourage tobacco use, with the funds primarily directed towards various public health initiatives.** Despite the existence of state laws like this one, tobacco use remains a leading cause of preventable death and disease in Arizona. Additionally, prevention efforts remain underfunded, as every $1 spent on prevention, Big Tobacco spends $7 on marketing.[57, 58]

Arizona Health Care Cost Containment System

AHCCCS is Arizona's Medicaid program, which provides healthcare services to low-income individuals and families. Established in 1982, AHCCCS operates in collaboration with the federal Medicaid program to provide affordable health insurance coverage.[59] As of May 1, 2025, AHCCCS served a total population of 1,998,561 Arizonans.[60] **This program ensures that low-income Arizonans with asthma can access the care necessary to control their condition and improve overall health outcomes.** Despite the benefits, some individuals may still face challenges accessing care in rural areas or dealing with complex asthma cases. Expanding access to healthcare providers and ensuring quicker referral processes could enhance the program's effectiveness for people with this condition.

Air Quality Flag Program

The voluntary Air Quality Flag Program was first launched in 2007, and it provides schools and communities with resources to track and respond to local air quality

[56] https://www.lung.org/policy-advocacy/tobacco/slati/states
[57] https://tobacco21.org/state/arizona/
[58] https://www.lung.org/research/sotc/state-grades/highlights/arizona
[59] https://www.azahcccs.gov/AHCCCS/AboutUs/
[60] https://www.azahcccs.gov/Resources/Downloads/PopulationStatistics/PopulationHighlights05012025.pdf

conditions.[61] **This program helps residents understand how air pollution impacts their health, particularly for individuals with asthma, and offers guidance on how to protect themselves during periods of poor air quality.** Essentially, the program provides educational materials and colored flags that notify the community about local air quality conditions.[62] By informing the public about outdoor air quality and advising on actions to reduce exposure, the program aims to minimize asthma exacerbations triggered by pollution. The effectiveness of the program depends on public awareness and participation. However, more targeted outreach to schools and caregivers could ensure that individuals with asthma are better prepared during poor air quality days.

Stock Albuterol Program

The Stock Albuterol Program, established law in 2017, allows schools to provide emergency albuterol inhalers to students experiencing asthma attacks. **This program is designed to ensure that all students, even those who do not have personal inhalers, have access to life-saving medications during school hours.** The program has been effective in reducing asthma-related absenteeism, as it allows students to return to class after an asthma event instead of being sent home (Lowe et al., 2021). Additionally, it has proven to be a cost-effective and practical solution to address asthma emergencies in schools[63]. While the program is highly beneficial, increasing awareness about its availability and expanding the number of schools that participate could further enhance its reach[64].

Smoke-Free Arizona Act

The Smoke-Free Arizona Act, passed in 2006, prohibits smoking in most enclosed public places and places of employment. The law aims to protect public health by reducing exposure to secondhand smoke, a known trigger for asthma attacks; it also includes a two-cent tax imposed on each pack of cigarettes purchased[65]. **By limiting smoking in public spaces, the act helps reduce asthma exacerbations in children and adults who are sensitive to smoke and improves air quality in public spaces.** There is still work to be done as secondhand smoke exposure in private settings (e.g., homes)[66] still poses a significant risk. Expanding public education on the dangers of secondhand

[61] https://azdeq.gov/pr/flagprg
[62] https://azdeq.gov/FlagProgram
[63] https://www.azasthma.org/school-stock-inhaler
[64] https://www.lung.org/blog/why-schools-should-stock-inhalers
[65] https://www.azdhs.gov/documents/preparedness/epidemiology-disease-control/smoke-free-arizona/reports/sfa-annual-report-2024.pdf
[66] https://www.azdhs.gov/preparedness/epidemiology-disease-control/smoke-free-arizona/index.php#exemptions

smoke and implementing stricter regulations in private areas could further benefit individuals with asthma.

Emergency Guidelines for Schools

The Emergency Guidelines for Schools (2017) is a document providing guidelines for Unlicensed Assistive Personnel (UAP) school staff who have little or no medical/nursing training for assisting a sick or injured student for school when the school nurse is unavailable. Each student should have an individual healthcare plan which should be made available at all times to school and emergency staff. In the event of an emergency, the UAP should refer to the student's individual health care plan. **This document includes specific instructions regarding situations involving a student with asthma or other breathing difficulties. It is important to ensure that all schools have up-to-date healthcare plans for students with asthma as it is crucial for optimal emergency response.**[67]

Fireworks Policy

In Arizona, fireworks laws have evolved over the years, with the state legalizing the sale and use of certain consumer fireworks, while still prohibiting certain types like aerial consumer fireworks.[68] The use of permissible fireworks is generally limited to specific times during the year. While fireworks may be part of festive traditions, they can pose serious health risks—especially for individuals with asthma and other respiratory conditions. **Firework smoke contains fine particles and chemicals that can trigger asthma attacks, reduce lung function, and worsen air quality, particularly during high-use periods**. For example, on holidays such as New Year's Eve, fine particulates from fireworks cause significant exceedances in the EPA health standards in Maricopa County. To better protect public health, especially vulnerable populations, Arizona could benefit from stricter regulations, stronger enforcement and public education around health risks. The local government may also consider stricter regulations, including adopting legislation that provides more restrictions than Arizona state law. [69],[70]

The state of Arizona has made notable progress in addressing asthma through policies and programs. However, there remains significant opportunity to enhance support for the community. The Asthma and Allergy Foundation of America offers a list of policy

[67] https://www.azdhs.gov/documents/prevention/womens-childrens-health/cyshcn/nursing/emergency-school-guidelines.pdf
[68] https://www.pinal.gov/DocumentCenter/View/12776/Firework-Descriptions-?bidId=
[69] https://www.azleg.gov/viewdocument/?docName=https://www.azleg.gov/ars/36/01606.htm
[70] https://www.lung.org/blog/fireworks-hidden-dangers

recommendations for programs in regard to schools and management plan in general.[71]

- **Expanding Emergency Medication Stocking in Schools**
  Arizona could strengthen its commitment to student health by requiring all schools to stock emergency asthma medications, such as albuterol inhalers. To make this effective, policies should include support for systematic data collection, provisions for staff training, legal protection for personnel administering medication in good faith, and funding mechanisms to ensure schools can consistently acquire and maintain necessary supplies.[72, 73]
- **Ensuring Full-Time School Nurses in Every School**
  Having a qualified nurse on-site is critical to managing chronic conditions like asthma. A statewide policy mandating at least one full-time nurse per would help ensure that students receive timely care. To support implementation, Arizona should prioritize funding for school health programs and explore collaborations with county health departments or healthcare systems to expand access.[74, 75]
- **Adopting Comprehensive Indoor Air Quality (IAQ) Management Plans**
  Asthma symptoms are often triggered by poor indoor air quality. Arizona should require public schools to adopt comprehensive IAQ management plans, including regular HVAC maintenance, use of non-toxic cleaning supplies, mold and pest control strategies, and ongoing air quality monitoring. These proactive measures would help create safer, healthier environments for all students.[76, 77]
- **Strengthening Tobacco and Vaping Policies in Schools**
  To protect students from asthma triggers and long-term respiratory damage, Arizona should enforce a zero-tolerance policy for tobacco and vaping products across all school properties and events. Schools should also be required to

[71] https://aafa.org/room-to-improve-report-highlights-gaps-in-state-policies-for-kids-with-allergies-and-asthma/
[72] https://azasthma.org/school-stock-inhaler
[73] https://airways.uahs.arizona.edu/news/2017/new-law-allows-arizona-schools-stock-administer-asthma-medication
[74] https://www.azed.gov/wellness/arizona-school-nurse-access-program-asap
[75] https://archive.cdc.gov/www_cdc_gov/healthyschools/achievement_stories/arizona.htm
[76] https://sfb.az.gov/sites/default/files/2022-04/web%20Indoor%20Air%20Quality%20Info%20July%202019.pdf
[77] https://www.azdeq.gov/k-12-schools-p2

deliver evidence-based prevention education and offer accessible cessation programs for students who already use these products.[78, 79, 80]

- **Mandating or Incentivizing School Bus Electrification**
  Replacing diesel school buses with electric alternatives can significantly reduce air pollution around schools and neighborhoods. Arizona can take the lead by adopting policies that encourage—or require—school districts to shift to electric bus fleets. Prioritizing funding for districts serving low-income and high-risk populations will ensure this transition supports health equity.[81]

[78] https://www.lung.org/media/press-releases/vape-free-schools-initiative-az
[79] https://www.pima.gov/2159/The-REAL-DEAL-on-Vaping
[80] https://www.lung.org/quit-smoking/helping-teens-quit/vape-free-schools
[81] https://www.azdeq.gov/k-12-schools-p2

METHODOLOGY

Secondary Data Collection

Exhibit 34 outlines the types of secondary data collected and analyzed, a description of the data, and provides the data sources used for this report. It also provides limitations in obtaining the data as requested by ADHS, where applicable.

Exhibit 34. Secondary Data Collected, Description, Limitations and Data Source

Topic Area	Description	Limitations	Data Source
Prevalence	Adult, child, current and lifetime, AZ and US	Data for 10-year trends was not available. Reported 5-year trends. Reported different 5-year timeframes for adults and children due to available CDC data. Arizona NHIS child prevalence data was not available for comparison to the US. Referenced the ADHS YRBSS and NSCH data but not able to make direct comparison between AZ and US for these since they are different surveillance tools.	Adults: CDC BRFSS Child: NHIS, NSCH, ADHS 2023 Respiratory Burden report-YRBS 2019 for AZ high school students
Demographic	Prevalence by age groups, gender, race/ethnicity, state and county levels	Data for 10-year trends was not available. Reported 5-year trends. Reported different 5-year timeframes for adults and children due to available CDC data.	CDC BRFSS, NHI
Geographic	Arizona and County map of adult prevalence	Access to CDC Maps was limited. Located 2022 data.	CDC BRFSS
Economic	Annual cost, projected cost, mortality trends	NACP estimates and projections are based on preliminary models and limited data and are not considered final. Mortality data from 2014-2021.	CDC NAC Asthma Cost Calculator, CDC Asthma Surveillance data
Healthcare Utilization	ED and Inpatient discharge data by: age groups, gender, state and county level	Data for 10-year trends was not available for ED discharges. Reported 5-year trend. Some counties' data was suppressed due to counts less than 6.	ADHS HDD, ADHS Population Health and Vital Statistics
Community (Homes, Schools)	Indoor air pollution, SHS, Stock inhaler program for schools	n/a	AZ School Health Needs Assessment, AAFA, ALA, CDC, Dr. Ashley Lowe, AZ Survey of School Nurses

Topic Area	Description	Limitations	Data Source
Environmental	Air quality, pollution, tobacco use	n/a	AHEQ, ATCP Strategic Plan 2022-2026, ALA State of the Air, Arizona Youth Survey, BRFSS
Health Policy	Health policy related to asthma	n/a	Various websites and research (cited in footnotes)

Limitations

The data presented in this report was from secondary data obtained through ADHS identified stakeholders, in addition to additional research by the LMA team members. Initial limitations the team encountered were related to obtaining accurate and timely data via recommended CDC sources as described above due to the Executive Orders. Other limitations to note include:

- This report uses only existing data from other sources, such as national and state health surveys and hospital records. While this information helps us understand asthma in Arizona, there are important gaps. For example, there was incomplete data for asthma prevalence in children under 5, people who identify outside of male or female genders, Native communities, or insurance cost data (e.g., AHCCCS). Some data was outdated, doesn't include smaller populations, or is reported in different ways that limited comparisons. These limitations limit the ability to provide a complete picture of asthma burden for these representative groups and contributing factors.
- In regard to the BRFSS data, it is important to consider the potential for reporting, recall, and social desirability bias from participants. Data is representative of those who completed the survey.
- There may be specific groups of people who are not represented in the hospital utilization data, such as American Indian/Alaska Native populations.
- The demographic data only included those who identified as male and female and may not have captured those who identified as non-binary, or other gender preference.
- CDC YRBSS and BRFSS websites have been modified to comply with the Federal Executive Orders which presented challenges with access to data at different time points during data collection and analysis.

- The hospitalization and ED visit cost data due to asthma, detailed by various payers: public (Medicare, AHCCCS/KidsCare, military, IHS) versus private payers was not accessible. A data sharing agreement between ADHS and AHCCCS will be required outlining asthma specific data.
- Data from the Arizona Youth Risk Behavior Surveillance System (YRBS) were used to supplement state-level status and to estimate asthma prevalence among students in grades 9–12 due to child limitations with child lifetime prevalence data. These results differed in methodology (self-reported vs. parent-reported), age range, and racial/ethnic categorization. While these two data sources provided a more complete picture of the asthma burden among children, methodological discrepancies.
- Data suppression limited the ability to make complete comparisons and identify data trends for the following: asthma prevalence for adult and children (US vs. Arizona), child demographic trends related to race/ethnicity and county-level discharge data.

SUMMARY AND RECOMMENDATIONS

LeCroy & Milligan Associates, Inc. was contracted by ADHS to complete an Asthma Burden Report using available secondary data from state and national surveillance systems and local partners, ADHS-relevant reports such as the Respiratory Burden Report and School Health Needs Assessment, the previous Asthma Burden Report and the AZ School Nurse Survey. This report examines asthma prevalence for adults and children, demographic and geographic distribution on both national and state levels, asthma mortality, healthcare utilization and contributing economic environmental and policy factors related to the asthma burden in Arizona. This report relies entirely on secondary data sources from national and state surveillance systems (e.g., BRFSS, NHIS, NSCH, YRBSS, HDD), administrative databases, and publicly available reports. While these sources offer key insights, they present limitations that affect the completeness and granularity of the findings. Arizona lacks access to asthma data for children under age 5, people who identify outside of male or female genders, Native communities, and insurance cost data (e.g., AHCCCS, IHS, private payer). Inconsistent race ethnicity categories from national surveillance systems, data suppression, and the inability to compare data across systems limit the understanding of health disparities and trends and can hinder strategic public health planning. Arizona-specific asthma data collection system future statewide action planning and funding priorities.

Many of the asthma related disparities identified in the 2016 Asthma Burden Report are relevant for this report, including higher asthma prevalence among adult women, Black and multiracial populations, and children aged 12–17. Although adult asthma prevalence has declined slightly and now aligns more closely with national averages, youth asthma prevalence remains high. Arizona's asthma mortality rate also continues to exceed the national average. The economic burden of asthma has grown, with projected costs rising from $2.2 billion in 2025 to $2.5 billion by 2030, emphasizing the continued financial impact on Arizona's healthcare system and families. Overall, Arizona's asthma burden has shown progress in areas such as policy and tobacco control, gaps in areas such as asthma surveillance remain.

Summary of Asthma Burden in Arizona

Asthma remains a significant public health concern in Arizona, across all age groups and disproportionately burdening specific populations and geographic areas. This report presents a comprehensive overview of the asthma burden using current and historical data from multiple local and national surveillance systems, including BRFSS, NHIS, NSCH, YRBSS, HDD, and ADHS administrative data sources, and partners, like the American Lung Association.

Prevalence: Although the current adult asthma prevalence has declined overall, it remained above the national average from 2018-2020. Adult lifetime asthma prevalence has remained above the national average from 2017 to 2021 (AZ: 15.2%; US: 14.3%). The current child asthma prevalence rate from the NSCH declined from 8.9% (2016-2017) to 6.6% (2020-2021), with an increasing trend to 8.7% for 2022-2023. Arizona did not report lifetime child asthma prevalence data for those years which **highlights the need for consistent child and adult asthma surveillance data.**

Demographics: Disparities across demographic groups show higher asthma rates among adult females, young adults aged 18–24, and Black and multiracial populations. Highest rates were in children ages 12-17 (15.6% in 2023), and lowest in children 0-4 years (average 3.3%). Black non-Hispanic children had the highest prevalence across all racial groups 2019-2021. Hispanic and Mexican-American children reported lower rates (5.0%). Arizona's YRBSS data showed a higher *self-reported* asthma prevalence (25.2%) among youth than the national average (21.8%), with Hispanic/Latino students, males, and 10th graders most affected. **Improved surveillance in this area will help identify health trends to prioritize populations most disproportionately affected.**

Geographic distribution: Arizona shows variation at the county level. Based on BRFSS data from 2019–2022, Pima County reported the highest asthma prevalence (10.4%), followed closely by Coconino, Mohave, Yavapai, Yuma, and Cochise (10.3%). Several rural counties, including Gila, Graham, Navajo, and Santa Cruz, reported lower prevalence rates (8.6%). This data may reflect differences in environmental exposures, healthcare access, population density, and health literacy and underscores **the need for continued localized surveillance to understand regional disparities.**

Economic Factors: Arizona's economic impact is substantial and projected to grow. Cost analyses show variation based on asthma control status, such that people with uncontrolled asthma pay higher costs for acute care and people with controlled asthma pay higher medication related costs but less for emergency services. This trend demonstrates the long-term value of effective asthma self-management and medication adherence. The CDC's NACP estimates the annual per-person incremental cost of asthma at $4,995.48. Total statewide costs are expected to rise from $2.3 billion in 2025 to $2.5 billion by 2030. Arizona's asthma mortality rate consistently exceeds the national average, highlighting the **need for continued attention to asthma management and evidence-based programs to reduce costs of ED and hospital visits**.

Health care utilization: ADHS HDD data showed ED and inpatient discharges for asthma have declined overall from 2014-2023, including a notable drop during the COVID-19 pandemic and partial rebound in 2023. ED discharges exceeded 20,000 in 2023 but were still below pre-pandemic levels. Children aged 0–17 and females consistently show higher ED utilization rates compared to other groups.

County-level analysis revealed persistent regional disparities. Average ED and IP discharge rates per 100,000 population from 2014 to 2023 were highest in rural and tribal regions, particularly Apache, Gila, Mohave, and Cochise counties. In contrast, more urban counties such as Maricopa and Pima had the highest total number of discharges, but lower discharge rates when adjusted for population size. Data from counties with small populations (e.g., Greenlee, La Paz, Santa Cruz) were often suppressed due to small case counts, limiting interpretability. This data highlights **the need to promote enrollment of eligible children and adults into systems of care such as AHCCCS, Kids Care and the Affordable Care Act coverage particularly in high-burden rural and tribal regions, to reduce preventable utilization and improve statewide asthma management.**

Schools: Arizona's Stock Inhaler for Schools Program has become a national model for emergency asthma response and is now implemented in 836 schools across 12 counties (32% of Arizona public schools). The pilot program reduced 9-1-1 calls by 20% and EMS transport dropped by 40% and allowed most students to return to class after an asthma episode. Despite this success, administrative burden for enrollment, training variability among unlicensed assistive personnel, and inequitable reach, especially in rural, tribal and under resourced areas, continue to limit full implementation. Arizona meets just over half of the Asthma and Allergy Foundation of America's school policy standards. Gaps remain in school environment policies (e.g., bus idling limits, tobacco prevention education, emergency protocols), presenting **opportunities for statewide alignment with evidence-based asthma management strategies in addition to supporting funding for school nurses which could improve compliance and asthma management.**

Home: Indoor air quality plays a critical role in asthma prevention and control as home environments remain a key source of asthma triggers. Indoor air quality is affected by secondhand smoke, thirdhand smoke, and poor air quality, mold, household chemicals, dust mites, and gas appliances, which can disproportionately affect lower-income households. Although the Smoke-Free Arizona Act in 2006 addressed SHS public exposure, SHS remains a concern in residences and multi-unit housing. **Improving indoor air quality through public education on pollutants, smoke-free housing**

initiatives, and culturally responsive home assessments represents a key opportunity to reduce asthma-related health disparities.

E**nvironmental Factors:** Arizona's environment continues to present significant respiratory health risks**,** with record numbers of high-pollution advisory days in recent years. Elevated levels of ozone, $PM_{2.5}$ (fine particulate matter), PM_{10} (coarse dust particles), wildfire smoke**,** and desert dust storms contribute to asthma exacerbations, particularly for vulnerable populations including children, older adults, and those with existing respiratory conditions. ADEQ's air quality monitoring and forecast data tools offer resources for public health preparedness and asthma self-management. Tobacco use remains a major concern. Disparities exist among individuals with lower educational attainment, those living in poverty, Native Americans, and males. While adult traditional cigarette use has declined, youth vaping is on the rise and a public health issue, given its strong link to asthma exacerbation. Half of Arizona teens who use EVPs report trying to quit, and many acknowledged the importance of having supportive adults in their lives. The ATCP's Five-Year Strategic Plan (2022–2026) outlines a framework to reduce smoking, vaping, and tobacco-related disparities through prevention, cessation, and policy strategies. Protecting the public from air pollution represents a key opportunity to reduce asthma severity and incidence. **Strategies may include public education on reducing personal exposure to air pollution and supporting policies to reduce emissions that cause ozone and particulate pollution. Integrating the ATCP's framework into asthma prevention can potentially advance equity and impact health outcomes.**

Health Policy: Federal and state policies play an important role in addressing the asthma burden and improving outcomes for Arizonans. National policies like the Clean Air Act and Affordable Care Act help reduce environmental triggers, establish environmental standards, and expand healthcare access. Programs such as Medicaid, Tobacco 21, and educational protections under Section 504 and IDEA support vulnerable populations, including children with asthma. Arizona policies like AHCCCS, the Smoke-Free Arizona Act, and the Stock Albuterol Program improve care access, reduce secondhand smoke exposure, and provide emergency medication in schools. Arizona's community-based prevention efforts include the Air Quality Flag Program and Emergency Guidelines for Schools. While progress has been made, **opportunities to continue investment in policy to expand school-based health supports, improve indoor air quality, and strengthen tobacco and vaping policies can reduce asthma health disparities statewide.**

Ultimately, Arizona's asthma burden reflects a complex intersection of individual, community, environmental, and policy level factors. While the state has made measurable progress in key domains, many disparities identified in the 2016 Asthma Burden Report remain persist. **This updated report provides a foundation to inform strategic planning, funding priorities, and opportunities to improve outcomes through evidence-based and equity-focused asthma interventions.**

Recommendations

Many of the 2016 Burden report's recommendations remain relevant today, including the need to improve asthma surveillance, expand access to asthma self-management education, develop written asthma action plans, support home and school-based interventions. The 2016 report also identified barriers to Medicaid reimbursement, disparities in asthma care access, and the underutilization of environmental trigger reduction programs.

This 2025 report builds upon those priorities with a renewed emphasis on the equitable application of evidence-based strategies and demonstrates the need for continued investment to achieve widespread improvements in asthma care coordination, management and health outcomes.

The updated recommendations were developed collaboratively by ADHS, the review team and contributing partners. They are grounded in a review of secondary data, and aligned with evidence-based public health frameworks, including the **CDC's EXHALE strategies** and **Healthy People 2030 objectives**. Each EXHALE strategy offers opportunities to reduce the asthma burden through coordinated interventions at the individual, community, environment, and systems levels.

These recommendations are intended to support cross-sector efforts between ADHS, the Arizona Asthma Coalition, and other partners in advancing equitable and effective asthma prevention and management strategies across the state. They can also guide future statewide resource development, inform grant applications, and shape future community-based efforts. The **EXHALE framework** served as an organizing structure, and a summary of the recommendations organized by EXHALE strategy is presented in Exhibit 35.

Exhibit 35. Recommendations Following the CDC's EXHALE Framework and Healthy People 2030

EXHALE Strategy		Recommendation	HP 2030 Asthma-related Goal
E	*Education on asthma self-management*	• Develop culturally responsive, age-appropriate **asthma education targeting high-prevalence groups** (e.g., youth, females, Black and multiracial populations).	• Reduce asthma attacks– RD-04; Reduce ED visits for children under 5 with asthma– RD-02; Reduce ED visits for people aged 5 years and over with asthma– RD-03; Reduce asthma deaths– RD-01; Reduce hospitalizations for asthma in people aged 5-64 years– RD-D02
		• Strengthen **youth-focused tobacco prevention efforts** by addressing vaping specifically and aligning messaging with existing peer-led asthma education initiatives. Leverage and expand on the ATCP's efforts.	• Reduce asthma attacks– RD-04; Reduce ED visits for people aged 5 years and over with asthma– RD-03; Reduce hospitalizations for asthma in people aged 5-64 years– RD-D02
		• Consider tailoring asthma education initiatives to counties with higher prevalence, **using localized data and community partners to reach Arizona's rural residents.**	• Reduce asthma attacks– RD-04; Reduce ED visits for children under 5 with asthma– RD-02; Reduce ED visits for people aged 5 years and over with asthma– RD-03
		• Explore potential for **youth-designed education materials or peer-led asthma education** opportunities.	• Reduce asthma attacks– RD-04; Reduce ED visits for people aged 5 years and over with asthma– RD-03
		• Consider potential for **statewide messaging** that reinforces the cost savings and health benefits of medication adherence and routine asthma care.	• Reduce asthma attacks– RD-04; Reduce asthma deaths– RD-01; Reduce hospitalizations for asthma in people aged 5-64 years– RD-D02
		• Support caregiver and youth-focused **asthma education efforts targeting the 0–17 age group**, especially in counties with the highest ED utilization.	• Reduce ED visits for children under 5 with asthma– RD-02; Reduce ED visits for people aged 5 years and over with asthma– RD-03; Reduce hospitalizations for asthma in children under 5 years– RD-D01

EXHALE Strategy		Recommendation	HP 2030 Asthma-related Goal
		• Align **public education efforts** that explain other indoor air hazards such as mold, gas stoves, and allergens, tailored for families with children.	• Reduce asthma attacks– RD-04; Reduce hospitalizations for asthma in children under 5 years– RD-D01; Reduce hospitalizations for asthma in people aged 5-64 years– RD-D02
		• Enhance public education campaigns using **ADEQ's air quality forecast tools**; promote widespread subscription to SMS/email alerts among families with children, especially those with asthma.	• Reduce asthma attacks– RD-04; Reduce ED visits for people aged 5 years and over with asthma– RD-03
		• Expand implementation of the **Air Quality Flag Program** in schools, camps, and childcare centers to raise awareness and support protective behavior.	• Reduce asthma attacks– RD-04; Reduce ED visits for people aged 5 years and over with asthma– RD-03
		• Strengthen efforts to expand and update **individualized asthma healthcare plans**, and how to provide **training for unlicensed assistive personnel** to recognize and respond to asthma symptoms.	• Reduce ED visits for children under 5 with asthma– RD-02; Reduce ED visits for people aged 5 years and over with asthma– RD-03; Reduce hospitalizations for asthma in children under 5 years– RD-D01; Reduce hospitalizations for asthma in people aged 5-64 years– RD-D02
		• Expand **educational staff training** on asthma accommodations and emergency protocols.	• Reduce ED visits for children under 5 with asthma– RD-02; Reduce ED visits for people aged 5 years and over with asthma– RD-03; Reduce hospitalizations for asthma in children under 5 years– RD-D01
		• Encourage school districts to pursue available **funding for school bus electrification** prioritizing areas with poor air quality and high asthma rates.	• Reduce asthma attacks– RD-04; Reduce asthma deaths– RD-01
X	*X-tinguishing smoking and secondhand smoke*	• **Expand the reach of the ATCP** to include targeted interventions for teens trying to quit e-cigarettes, including digital peer support programs and school-based cessation initiatives. • Strengthen enforcement and **community education** under the **Smoke-Free Arizona Act**,	• Reduce asthma attacks– RD-04; Reduce ED visits for people aged 5 years and over with asthma– RD-03; Reduce hospitalizations for asthma in people aged 5-64 years– RD-D02 • Reduce asthma attacks– RD-04; Reduce ED visits for people aged 5 years and over with asthma– RD-03;

EXHALE Strategy		Recommendation	HP 2030 Asthma-related Goal
		targeting multi-unit housing and private indoor environments. • Consider strengthening **outreach about SHS and thirdhand smoke risks** in multi-unit housing; explore incentives or voluntary policies for smoke-free housing adoption. • Advocate for **expanded use of tobacco luxury tax revenue** for asthma prevention, including targeted youth education campaigns. • Support full implementation of **Tobacco 21**, including local enforcement, compliance monitoring, and youth cessation resources. • Explore successful program intervention identified by the Regional Asthma Management & Prevention (RAMP).	Reduce hospitalizations for asthma in people aged 5-64 years– RD-D02 • Reduce asthma attacks– RD-04; Reduce ED visits for children under 5 with asthma– RD-02 • Reduce asthma attacks– RD-04; Reduce ED visits for children under 5 with asthma– RD-02 • Reduce asthma attacks– RD-04; Reduce ED visits for people aged 5 years and over with asthma– RD-03 • Reduce asthma deaths– RD-01; Reduce ED visits for children under 5 with asthma– RD-02; Reduce ED visits for people aged 5 years and over with asthma– RD-0; 3Reduce hospitalizations for asthma in people aged 5-64 years– RD-D02; Reduce ED visits for people aged 5 years and over with asthma– RD-03
H	*Home visits for trigger reduction and asthma self-management education*	• Explore local pilot programs that could provide **in-home asthma education** to families in wildfire- or dust-prone or other high-risk areas. (e.g., community health worker pilot). • **Explore opportunities for coverage for CHW-led home visits** for asthma education, medication use and trigger control, and environmental assessments for families of high-risk children after ED discharges.	• Reduce asthma attacks– RD-04; Reduce ED visits for children under 5 with asthma– RD-02; Reduce ED visits for people aged 5 years and over with asthma– RD-03; Reduce hospitalizations for asthma in children under 5 years– RD-D01; Reduce hospitalizations for asthma in people aged 5-64 years– RD-D02 • Reduce ED visits for children under 5 with asthma– RD-02; Reduce ED visits for people aged 5 years and over with asthma– RD-03; Reduce hospitalizations for asthma in children under 5 years– RD-D01; Reduce hospitalizations for asthma in people aged 5-64 years– RD-D02

EXHALE Strategy		Recommendation	HP 2030 Asthma-related Goal
		• **Strengthening guidance on mitigating indoor air pollution** from wildfire smoke, including filtration, window sealing, and low-cost air cleaners. • Consider ways to use the Clean Air Act and local air quality data to **prioritize neighborhoods** for any home-based asthma services. • Consider potential for any **telehealth visits and hybrid models and in-home or virtual asthma education** to increase reach to rural, underserved and high prevalence areas. • Explore opportunities to integrate **home visits and indoor air quality education into Medicaid-covered services** for families with children with asthma. • Promote **school-based environmental health efforts**, including integrated pest management and improved indoor air quality practices.	• Reduce asthma attacks– RD-04; Reduce ED visits for people aged 5 years and over with asthma– RD-03 • Reduce asthma attacks– RD-04; Reduce hospitalizations for asthma in people aged 5-64 years– RD-D02 • Reduce ED visits for children under 5 with asthma– RD-02; Reduce ED visits for people aged 5 years and over with asthma– RD-03; Reduce hospitalizations for asthma in children under 5 years– RD-D01 • Reduce asthma attacks– RD-04; Reduce ED visits for children under 5 with asthma– RD-02; Reduce hospitalizations for asthma in children under 5 years– RD-D01 • Reduce asthma attacks– RD-04; Reduce hospitalizations for asthma in people aged 5-64 years– RD-D02; Reduce ED visits for people aged 5 years and over with asthma– RD-03
A	*Achievement of guidelines-based medical management*	• Prioritize **Stock Inhaler program expansion in underserved/rural counties** with fewer school participation (only 13 counties currently engaged. • Support primary care providers with **tools to improve asthma diagnosis**, particularly in 0–4 age group. • **Consider ways to promote the use of asthma action plans** in clinical and school settings and increase access to controller medications for high-risk populations. • Explore provider training and **decision-support tools that flag patients at risk** for mortality or repeat acute care episodes and with repeat ED	• Reduce asthma attacks– RD-04; Reduce ED visits for people aged 5 years and over with asthma– RD-03; Reduce hospitalizations for asthma in children under 5 years– RD-D01 • Reduce ED visits for children under 5 with asthma– RD-02; Reduce hospitalizations for asthma in children under 5 years– RD-D01 • Reduce asthma attacks– RD-04; Reduce ED visits for children under 5 with asthma– RD-02; Reduce ED visits for people aged 5 years and over with asthma– RD-03; Reduce hospitalizations for asthma in children under 5 years– RD-D01 • RD-01, Reduce asthma attacks– RD-04; Reduce ED visits for people aged 5 years and over with asthma–

EXHALE Strategy		Recommendation	HP 2030 Asthma-related Goal
		visits and link them to asthma case management programs. • Encourage providers to integrate **ADEQ forecasts into asthma care planning and trigger management instructions**, especially in primary care and urgent care settings • Train providers to address both **environmental and tobacco exposure triggers** as part of comprehensive asthma visits, particularly for youth reporting EVP use. • **Expand the Stock Albuterol Program statewide**, with policies mandating that all schools participate and receive funding for staff training and inhaler maintenance. • Encourage local healthcare systems in high-burden counties to implement **asthma management protocols** aligned with CDC guidelines. • Expand **presence of school nurses** to support effective asthma management and clarify roles between licensed and unlicensed staff for administering care and emergency response.	RD-03; Reduce hospitalizations for asthma in people aged 5-64 years– RD-D02 • Reduce asthma attacks– RD-04 • Reduce asthma attacks– RD-04; Reduce ED visits for people aged 5 years and over with asthma– RD-03 • Reduce asthma attacks– RD-04; Reduce ED visits for children under 5 with asthma– RD-02; Reduce hospitalizations for asthma in children under 5 years– RD-D01 • Reduce asthma attacks– RD-04; Reduce hospitalizations for asthma in people aged 5-64 years– RD-D02; Reduce ED visits for people aged 5 years and over with asthma– RD-03 • Reduce ED visits for children under 5 with asthma– RD-02; Reduce hospitalizations for asthma in children under 5 years– RD-D01; Reduce hospitalizations for asthma in people aged 5-64 years– RD-D02
L	*Linkages and coordination of care across settings*	• Establish a system for schools to annually **report asthma management practices and outcomes**, supporting statewide data-driven improvements in asthma care. • Emphasize prevention of Emergency Department visits for Asthma as the first diagnosis as a central priority across all systems. • Consider **adopting and expanding the Maricopa County's School Surveillance Medication (SSMP) Program** as a data driven approach to centralized compliance and enrollment tracking.	• Reduce asthma attacks– RD-04; Reduce hospitalizations for asthma in children under 5 years– RD-D01; Reduce hospitalizations for asthma in people aged 5-64 years– RD-D02 • Reduce ED visits for children under 5 with asthma– RD-02 • Reduce ED visits for children under 5 with asthma– RD-02; Reduce ED visits for people aged 5 years and over with asthma– RD-03

EXHALE Strategy	Recommendation	HP 2030 Asthma-related Goal
	• **Consider integration of additional standardized data to track all emergency medication** administrations (e.g., albuterol, epinephrine).	• Reduce ED visits for people aged 5 years and over with asthma– RD-03
	• Consider **consolidation of county-level data into a unified state reporting system.**	• Reduce ED visits for people aged 5 years and over with asthma– RD-03; Reduce asthma attacks– RD-04
	• Ensure consistent, **statewide reporting and linkage to asthma surveillance systems.**	• Reduce asthma attacks– RD-04
	• **Obtain ED visits resulting in inpatient admissions for asthma** to analyze trends in average inpatient length of stay (LOS) for asthma hospitalizations over time to identify areas for improved care coordination and resource allocation.	• Reduce ED visits for children under 5 with asthma– RD-02
	• **Establish interagency data-sharing agreements** (e.g., MOUs) between ADHS, AHCCCS, ADE, and county health departments to support asthma surveillance.	• Reduce ED visits for children under 5 with asthma– RD-02; Reduce ED visits for people aged 5 years and over with asthma– RD-03; Reduce asthma attacks– RD-04; Reduce hospitalizations for asthma in children under 5 years– RD-D01; Reduce hospitalizations for asthma in people aged 5-64 years– RD-D02
	• **Facilitate secure exchange of asthma-related data–**including ED visits, inpatient admissions, school health data, and stock medication use to improve coordinated care and program effectiveness.	• Reduce hospitalizations for asthma in children under 5 years– RD-D01; Reduce hospitalizations for asthma in people aged 5-64 years– RD-D02
	• **Link and integrate ADHS internal data systems** (e.g., EMS, trauma registries, surveillance dashboards)	• Reduce hospitalizations for asthma in people aged 5-64 years– RD-D02
	• **Request AHCCCS asthma-related data with expanded payer representation** (asthma-specific ICD-10 and CPT codes, co-morbid conditions, lab-confirmed diagnoses, length of inpatient stay, and both direct and indirect cost estimates for AHCCCS-covered populations and non-AHCCCS	• Reduce asthma attacks– RD-04

EXHALE Strategy	Recommendation	HP 2030 Asthma-related Goal
	payers (e.g., Medicare, private insurers, IHS, military) to allow for a more comprehensive statewide analysis of asthma care and costs.	
	• Create **care coordination protocols between schools, community health centers, and pediatric providers**, especially for children and adolescents with repeat asthma symptoms or ED visits.	• Reduce ED visits for children under 5 with asthma– RD-02; Reduce ED visits for people aged 5 years and over with asthma– RD-03; Reduce hospitalizations for asthma in children under 5 years– RD-D01
	• Encourage pediatricians and school nurses to routinely **screen for environmental triggers** (e.g., smoking at home, proximity to traffic or industry).	• Reduce asthma attacks– RD-04
	• Explore **care coordination programs** that identify high utilizers of ED or inpatient care for asthma and connect them to community or primary care interventions.	• Reduce ED visits for people aged 5 years and over with asthma– RD-03; Reduce hospitalizations for asthma in people aged 5-64 years– RD-D02
	• Create a **cross-sector asthma management task force** including schools, Medicaid plans, pediatric clinics, and public health departments to standardize response protocols.	• Reduce asthma attacks– RD-04; Reduce hospitalizations for asthma in people aged 5-64 years– RD-D02; Reduce hospitalizations for asthma in adults aged 65 years and over– RD-D03
	• Support **data-sharing agreements** between school health programs and healthcare providers to ensure real-time access to asthma action plans and emergency events.	• Reduce asthma attacks– RD-04; Reduce hospitalizations for asthma in children under 5 years– RD-D01
	• Explore opportunities to **strengthen coordination between EDs and primary care providers** to ensure timely follow-up after asthma-related ED discharges.	• Reduce ED visits for people aged 5 years and over with asthma– RD-03; Reduce hospitalizations for asthma in people aged 5-64 years– RD-D02
	• Strengthen **county-level partnerships** between public health, primary care, and school systems to ensure coordinated response in higher-prevalence areas.	• Reduce asthma attacks– RD-04; Reduce hospitalizations for asthma in people aged 5-64 years– RD-D02; Reduce hospitalizations for asthma in adults aged 65 years and over– RD-D03

EXHALE Strategy		Recommendation	HP 2030 Asthma-related Goal
		• Inform **strategic planning and resource allocation**, facilitating better linkage between clinical care, community-based services, and policy decisions.	• Reduce asthma deaths– RD-01; Reduce ED visits for people aged 5 years and over with asthma– RD-03; Reduce hospitalizations for asthma in people aged 5-64 years– RD-D02
		• Ensure that asthma-related healthcare **utilization and cost data routinely accessible** to support coordinated care, resource planning, and evaluation of asthma control efforts across systems.	• Reduce ED visits for people aged 5 years and over with asthma– RD-03; Reduce asthma attacks– RD-04; Reduce hospitalizations for asthma in people aged 5-64 years– RD-D02
		• Explore opportunities for data sharing and system linkages at the state level to more effectively capture and monitor the burden of asthma.	• Reduce asthma attacks– RD-04
E	*Environmental policies or best practices to reduce asthma triggers from indoor, outdoor, and occupational sources*	• Explore statewide policy to ensure adequate and standardized asthma data collection, including reporting from schools, emergency departments, and Medicaid/insurance providers.	• RD-04 (Reduce asthma attacks), RD-D02 (Reduce hospitalizations)
		• Investigate **environmental or systemic contributors** to rising youth prevalence (e.g., housing, air quality).	• Reduce asthma attacks– RD-04
		• Support **school and home environmental assessments** where child asthma rates are elevated.	• Reduce asthma attacks– RD-04; Reduce hospitalizations for asthma in children under 5 years– RD-D01; Reduce hospitalizations for asthma in people aged 5-64 years– RD-D02
		• Encourage **statewide indoor air quality (IAQ) policy** requiring schools to implement IAQ plans (e.g., HVAC maintenance, mold prevention, pest control).	• Reduce asthma attacks– RD-04; Reduce hospitalizations for asthma in children under 5 years– RD-D01
		• Encourage **coordination between local housing authorities and public health departments** to promote indoor air quality standards in rental and subsidized housing.	• Reduce asthma attacks– RD-04; Reduce hospitalizations for asthma in people aged 5-64 years– RD-D02

EXHALE Strategy	Recommendation	HP 2030 Asthma-related Goal
	• Investigate potential for an incentive program for **school bus electrification**, prioritizing districts with high asthma rates and low air quality.	• Reduce asthma attacks– RD-04; Reduce ED visits for people aged 5 years and over with asthma– RD-03; Reduce hospitalizations for asthma in people aged 5-64 years– RD-D02
	• Encourage adoption of **local smoke-free and vape-free policies** in school zones, parks, and multi-unit housing as asthma prevention strategies.	• Reduce asthma attacks– RD-04; Reduce ED visits for people aged 5 years and over with asthma– RD-03
	• Strengthen local **fireworks ordinances** to reduce asthma triggers and improve public messaging about respiratory health risks.	• Reduce asthma attacks– RD-04; Reduce ED visits for people aged 5 years and over with asthma– RD-03
	• Enhance enforcement of the Clean Air Act in Arizona's **urban and industrial corridors**, where asthma rates and emissions are high.	• Reduce asthma attacks– RD-04; Reduce hospitalizations for asthma in people aged 5-64 years– RD-D02
	• Strengthen use of county-level data to **prioritize environmental monitoring and interventions** (e.g., air quality alerts in high-prevalence areas).	• Reduce asthma attacks– RD-04; Reduce ED visits for people aged 5 years and over with asthma– RD-03
	• **Leverage record-high air quality alert days** and PM2.5/PM10 data trends to drive public education campaigns and inform targeted interventions in high-risk areas	• Reduce asthma attacks- RD-04; Reduce hospitalizations for asthma in children under 5 years- RD-D01. Reduce hospitalizations for asthma in people aged 5–64 years- RD-D02.
	• Strengthen **enforcement of indoor air quality (IAQ) regulations in childcare centers, schools, and multi-family housing** through use of EPA-supported tools (e.g., *Indoor Air Quality Tools for Schools Action Kit*).	• Reduce ED visits for children under 5 RD-D01 & RD-D02; Reduce asthma-related hospitalizations in young children and working-age adults

APPENDIX A. GLOSSARY OF TERMS

Acronym	Definition
AAFA	Asthma and Allergy Foundation of American
ADEQ	Arizona Department of Environmental Quality
ADHS	Arizona Department of Health Services
ALA	American Lung Association
AYS	Arizona Youth Survey
ATCP	Arizona Tobacco Control Program
BRFSS	Behavioral Risk Factor Surveillance System
CDC	Centers for Disease Control and Prevention
CHW	Community Health Worker
ED	Emergency Department
EMS	Emergency Medical Services
EVP	Electronic Vapor Product
HVAC	Heating, Ventilation, and Air Conditioning
ICD	International Classification of Diseases
IAQ	Indoor Air Quality
IP	In-patient

MCDPH	Maricopa County Department of Public Health
NACP	National Asthma Air Quality Standards
NH	Non-Hispanic
NHIS	National Health Interview Survey
NSCH	National Survey of Children's Health
$PM_{2.5}$ / PM_{10}	Particulate Matter (fine/coarse)
SHS	Second-hand Smoke
SIDS	Sudden Infant Death Syndrome
SSMP	School Surveillance Medication Program
UAP	Unlicensed Assistive Personnel
US	United States
YRBSS / YRBS	Youth Risk Behavior Surveillance System / Survey

APPENDIX B. CHILD LIFETIME ASTHMA PREVALENCE

Child Lifetime Asthma Prevalence, **U.S.**, by Age, Gender, and Race/Ethnicity, 2019-2023, NHIS

Category	Subgroup	2019 US	2020 US	2021 US	2022 US	2023 US	5-year average
Children (Total)	All Children 0-17	10.5%	9.4%	10.2%	9.9%	10.3%	10.1%
Children by Age Group	0-4 Years	3.2%	3.7%	2.6%	3.2%	3.9%	3.3%
	5-11 Years	11.9%	8.9%	11.0%	10.6%	9.8%	10.4%
	12-17 Years	14.8%	14.4%	15.0%	13.9%	15.6%	14.7%
Children by Gender	Male	8.4%	5.7%	7.3%	7.0%	5.4%	6.8%
	Female	5.5%	6.0%	5.6%	7.6%	5.7%	6.1%
Children 0-17 by Race/ Ethnicity *NH indicates Non-Hispanic	White NH*	5.7%	5.2%	5.7%	*N/A	N/A	5.5%
	Black NH	13.5%	8.9%	12.5%	N/A	N/A	11.6%
	Other NH	6.0%	5.9%	5.7%	N/A	N/A	5.9%
	Hispanic	6.7%	5.6%	5.4%	N/A	N/A	5.9%
	Mexican/Mexican American	5.0%	5.1%	5.5%	N/A	N/A	5.2%
	Other Hispanic	9.6%	6.6%	5.1%	N/A	N/A	7.1%

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