

Struggling to Breathe:

The Epidemic of Asthma Among Children and Adolescents in the San Joaquin Valley



by

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Executive Summary

Asthma is a serious and growing epidemic that disproportionately affects school-age children in the San Joaquin Valley. Over 1 million children live in the eight San Joaquin Valley counties (Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare). An estimated 157,000 (15.8%) children and adolescents ages 0-17 in the San Joaquin Valley have been diagnosed with asthma.

The high prevalence of asthma in San Joaquin Valley communities makes ongoing surveillance of critical importance to detect and manage this chronic health condition. Currently, asthma is not a reportable public health condition, making it difficult to monitor its prevalence and produce precise data for local communities. Results from the 2001 California Health Interview Survey (2001 CHIS) have helped compensate for the historical absence of detailed regional and local surveillance data. Data are presented to inform policy-makers, agencies, organizations, and communities concerned about this chronic condition and its effect on the health and well-being of children and adolescents, their families, and their communities.

Disparities in Asthma Prevalence and Management

The results of the 2001 CHIS indicate that there are differences or disparities in the prevalence of asthma and asthma symptoms among children by age, gender, ethnicity, income level and place of residence. For example, the data examined in this report show that asthma is slightly more common among boys than it is among girls, as 60% of children who have been diagnosed with asthma in the San Joaquin Valley are boys. However, among all children diagnosed with asthma, girls, especially adolescent girls ages 12-17, experience asthma symptoms more frequently than do boys.

Asthma is more common among African American and American Indian children than it is among Latino, Asian or White children in the San Joaquin Valley. Over 1 in 3 African American and American Indian children have been diagnosed with asthma, compared with 1 in 6 White children, 1 in 8 Latino children, and almost 1 in 10 Asian children. Where children live also seems to be a factor in asthma diagnosis. Rates of asthma are highest among children who live in Fresno and Kings Counties, where over 20% of children ages 0-17 have been diagnosed with asthma, compared with 15.8% Valley-wide.

The Costs of Asthma

Our health, educational, social, and family systems all bear the costs of asthma. Asthma-related costs include health care for asthma management, local revenues lost through decreased school attendance, and disruptions in daily routines that may affect the employment, income, and quality of life of families of children diagnosed with asthma. Over half of all San Joaquin Valley children and adolescents diagnosed with asthma, an estimated 87,000 children, take medication to control asthma symptoms. Even with medication, 6 in 10 of these children experience asthma symptoms once a month or more often. San Joaquin Valley children and adolescents with asthma report an estimated 25,000 emergency department visits and 4,000 hospitalizations annually. Public, private and local sources all bear these health care costs.

Local school districts lose revenue due to asthma-related student absences. One third of adolescents diagnosed with asthma miss one or two days of school every month. Based on statewide estimates, with 11.5% of school-age children living in the San Joaquin Valley, the conservative estimate of the Valley's annual school absenteeism due to asthma totals 808,000 absences, accounting for lost revenue to regional school districts of at least \$26 million annually.

The findings of this report underscore the urgency of finding viable solutions for San Joaquin Valley communities. The future for children with asthma in the San Joaquin Valley remains uncertain. Considering that the San Joaquin Valley has the highest prevalence of childhood asthma in the state, Valley policy-makers, health, education, and social service providers must address environmental policy as a priority. Their collaborative efforts must identify and provide needed care for children and adolescents with asthma, as well as monitor and reduce related school absences, emergency room visits, and hospitalizations. The future of our children and the San Joaquin Valley depends on it.

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Methodology

Data Sources

This report uses secondary data and prevalence estimates about asthma from the 2001 California Health Interview Survey (2001 CHIS; UCLA Center for Health Policy Research, 2004). The CHIS is a telephone survey of California communities that was conducted in six languages by the Center for Health Policy Research at the University of California, Los Angeles School of Public Health, between November 2000 and September 2001. Households with children ages 0-17 in the San Joaquin Valley and other communities in the state were randomly selected, and telephone interviews were conducted with the adult who had the most knowledge about the child under age 12 about whom data were being gathered and with one adolescent age 12-17 if living in the same household. Responses to questions about asthma and other health conditions and behaviors were collected during these interviews, and these responses were used to calculate county-level estimates for the prevalence of asthma in the eight counties of the San Joaquin Valley. The tables and figures in this report contain current estimates of the extent of asthma and asthma symptoms from the 2001 CHIS.

In addition, data from the U.S. Census Bureau are used to present San Joaquin Valley children's demographic characteristics, such as number of children and their ethnicity.

Data Limitations

The 2001 CHIS was conducted using a random sample of the San Joaquin Valley population. The numbers and percentages presented in this report are therefore weighted estimates of the prevalence of asthma and asthma symptoms among children ages 0-11 and adolescents ages 12-17.

When relatively small numbers of survey participants are used to generate population estimates, there is always some error introduced. To mitigate the effects of such sampling bias, CHIS researchers used special weighting procedures. In some cases, however, the level of potential error is such that the estimate is unavailable or is considered unstable. In some instances in this report, unstable estimates are presented along with stable estimates for the purpose of comparison between groups of data. The authors recognize this limitation of the data presented and encourage the reader to use caution in interpreting estimates and percentages identified as unstable.

The authors also recognize the potential bias of the self-report data collected in the 2001 CHIS, as respondents' subjective experiences and understanding of asthma and asthma symptoms may vary. In addition, the identity and experiences of each respondent may introduce bias in other ways. All of the data reported for children, ages 0-11, was reported by a parent or responsible adult, not the children themselves. In contrast, the data reported for adolescents, ages 12-17, was reported by the adolescent participant directly.

Facts About Asthma

Asthma is a chronic inflammatory disease of the lungs characterized by recurrent episodes of breathlessness, wheezing, coughing, and chest tightness, termed *exacerbations*. The underlying cause of asthma is unknown, although medical personnel and public health professionals believe it is related to the interplay of several factors, including frequency and severity of early-life infections, genetics, diet, exposure to indoor allergens, as well as indoor and outdoor pollution (McConnell et al., 2002). Specific factors thought to trigger asthma symptoms include sinus infections, air pollution, excessive exercise, exposure to cold air, and exposure to irritants such as cigarette smoke and chemicals. Even certain emotional states such as fear, laughing, and crying can trigger asthma symptoms (Schwartz, 1999).

The Prevalence of Asthma

Asthma is a serious and growing epidemic in California and the United States, which is generally discussed in terms of lifetime asthma prevalence and asthma symptom prevalence. *Lifetime asthma prevalence* refers to a person being diagnosed with asthma at any time during his or her lifetime, whereas *asthma symptom prevalence* refers to a person being diagnosed with asthma at any time during his or her lifetime and experiencing asthma symptoms at least once in the previous 12 months.

In 2002, the national lifetime asthma prevalence was estimated at 10.1% (Brown, Meng, Babey, & Malcolm, 2002). Between 1980 and 1994, the number of persons diagnosed with asthma in the United States increased by 75% (Mannino et al., 1998), and the most dramatic rate increase occurred among young children. During this period, the number of children under age 5 diagnosed with asthma increased by 160% (Mannino et al., 1998).

The lifetime asthma prevalence in California as a whole and in many California counties is higher than the national average for most population groups (Brown et al., 2002). In California, an estimated 3.9 million people (adults and children) — 11.9% of the population — are reported to have been diagnosed with asthma (Brown et al., 2002). In addition, nearly 3 million people or 8.8% of the California population reported experiencing asthma symptoms at least once a year, and nearly three-quarters of a million or 25% of those who experience asthma symptoms reported experiencing asthma symptoms every day or every week (Brown et al., 2002).

Asthma and Its Profound Impact on Children

Research has shown that asthma disproportionately affects school-age children (Brown et al., 2002). This report summarizes what is currently known about asthma and its impact on the lives of children and adolescents who reside in the San Joaquin Valley counties of Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare. It is anticipated that this report will advance discussion about the effects of this chronic health condition on the well-being of children and adolescents in the counties of the San Joaquin Valley and underscore the urgency of finding viable solutions for Valley communities whose children and adolescents are affected by asthma. Implications based on the findings of this report are presented, as are recommendations related to disparities in asthma prevalence and management of asthma symptoms; the need for surveillance to detect, monitor, and track the progress of care for children and adolescents diagnosed with asthma; and environmental policy.

The environmental influences on respiratory disease in children. Research offers support in defining the relationship between environmental factors and respiratory conditions of children. There is evidence of an association between air pollutants and increased respiratory disease and symptoms in children with asthma (McConnell et al., 1999), impaired lung function and growth in children (Gauderman et al., 2002, 2004), and increased hospitalizations and emergency room visits for children with asthma (Norris, 1999). Chronic exposure to particulate matter has already been associated with increased mortality in adults from respiratory disease and lung cancer (Abbey et al., 1999), and there is now evidence to suggest that it may be associated with increased mortality from respiratory causes in infants (Woodruff, Grillo, & Schoendorf, 1997). Clearly, compromised air quality is a major contributing factor in the frequency and severity of asthma symptoms in children with asthma and is associated with potentially deadly consequences for children and adolescents affected by this condition. These findings have important implications for the San Joaquin Valley considering that ozone and particulate matter air pollution in the Valley is among the worst in the state (California Air Resources Board, 2004d).

Children are particularly susceptible to air pollution, because of their physiological and behavioral characteris-

tics. Their airways are smaller and more vulnerable to inflammation from irritants. In addition, children spend more time outdoors playing or walking. Children also have a higher rate of respiration per minute than do adults. They tend to breathe through their mouths, creating direct exposure to respiratory systems. Because their immune systems and lungs are still developing, they are generally more susceptible to the ill effects of environmental pollutants and inhale more pollutants per pound than do adults (Bates, 1995; California Air Resources Board, 2004c; Gauderman et al., 2002, 2004). These characteristics are believed to make children more vulnerable to the influence of environmental factors and may partially explain the prevalence of asthma symptoms in children.

California studies on air pollution and children. Although air pollution plays a well-documented role in exacerbating asthma symptoms, its role in initiating asthma is still under study. Currently, two prominent studies are in progress in California to increase the understanding of the relationship between air pollution and asthma: the Children's Health Study and the Fresno Asthmatic Children's Environment Study (F.A.C.E.S.).

The Children's Health Study (California Air Resources Board, 2004c) was initiated in 1992 among cohorts of 4th, 7th, and 10th graders living in Southern California. During the course of the study, data were collected from the following sources: samples of four criteria pollutants (ozone, particulate matter, acid vapor, and nitrogen dioxide) from school and home settings; results from lung function tests performed on participants; and detailed inventories of participants' health histories (including diagnosis of asthma and asthma symptoms); number of school absences; level of activity; time spent outdoors; and exposure to house pollutants, such as parental smoking, mold, and pets in the household. Results indicated that air pollution slows children's lung growth and reduces breathing capacity, and impacts respiratory health in asthmatic children. Active children living in high ozone communities were found to be up to three times more likely to develop asthma than were active children not living in such communities. Findings also indicated more school absences due to upper respiratory illnesses (e.g., runny nose) and lower respiratory illnesses (e.g., asthma episodes) in communities with elevated ozone levels (California Air Resources Board, 2004b).

The F.A.C.E.S. study (California Air Resources Board, 2004a), which began in 2000, is studying children ages 6-11 with asthma living in the Fresno area. The goal of the

study is to determine the effects of particulate matter, in combination with other air pollutants, on the progression of asthma in young children. Preliminary results for F.A.C.E.S. are not yet available.

The Far-Reaching Costs of Asthma

Many children with asthma require ongoing care, including medication, medical equipment, patient education, and long-term management from primary care providers, specialists, and other health care providers. The costs to patients, families, and society to secure care and needed treatment are extensive.

Estimating the costs of asthma care is one way to measure the economic and social impact of this condition on individuals, families, and communities. In 1998, the National Heart, Lung and Blood Institute estimated that the annual costs of asthma were \$11.3 billion per year. This estimate included \$7.5 billion in direct medical expenses and \$3.8 billion in indirect expenses such as lost workdays for adults with asthma and lifetime earnings lost due to mortality from asthma (U. S. Department of Health and Human Services, 2000).

The costs of asthma care. The overall goal of asthma treatment is to control chronic symptoms, maintain normal activity levels, maintain normal or near-normal pulmonary function, and prevent acute episodes (Boynton, Dunn, & Stephens, 1998). There are well-established interventions, medications, and management guidelines that can effectively minimize or control the symptoms and prevent associated morbidity and mortality (California Department of Health Services, 2002) as well as higher cost treatments such as emergency room use and inpatient hospitalization.

For most patients with asthma, ideal therapy includes the use of a daily anti-inflammatory medication, a metered-dose inhaler with a bronchodilator as needed to treat symptoms, as well as non-pharmacologic management such as patient education, environmental control, and home monitoring with a peak flow monitor.

The costs of medications can be expensive, especially if a supply is needed at school as well as at home or if the medication is lost and needs to be replaced. Depending on insurance coverage, copayment for metered-dose inhalers ranges from \$5 to \$150 (P. Burton, personal communication, March 10, 2003). The one-time purchase (and occasional replacement) of a spacer, which is a part of an inhaler, ranges from \$30 to \$60. Many insurance compa-

nies consider a spacer to be durable medical equipment, and deductibles for this piece of equipment can start as high as \$500 (L. Parry, personal communication, April 14, 2003). The cost for a peak flow meter may range from \$50-\$70. Purchasing medication and equipment needed to manage this chronic condition creates financial hardship for many families with children who have asthma.

The costs to education. Asthma-related school absences and the potential threat they pose to school performance represent other serious costs. It is difficult to estimate how many days of school are lost in the state due to asthma, because California school districts are not required to document the reason for a child's absence. Nevertheless, newspaper reports identify asthma as the primary reason for school absences in the Fresno Unified School District on smoggy days or during the days following a smog alert ("Last Gasp," 2002). Substantial costs result from asthma-related school absences, as local school district revenue is reduced when school attendance drops.

School nurses in the Fresno Unified School District estimate that nearly 7,000 children and adolescents list asthma as an existing condition on their health emergency card

(E. Beyer, personal communication, January 15, 2003) and that the number of school children attending this district who are identified as having asthma has increased almost 200% in the past 12 years ("Last Gasp," 2002). On the basis of these estimates, even if children with asthma missed only one day per month, asthma would still account for over 70,000 annual absences in just one large school district.

Statewide estimates indicate that asthma is responsible for 7 million school absences per year, resulting in lost revenue of \$231 million (Richman, 2004). Based on statewide estimates, with 11.5% of school-age children ages 5-17 living in the San Joaquin Valley, the estimate of the Valley's annual school absenteeism totals 808,000 absences. This accounts for lost revenue to regional school districts of at least \$26 million annually. Given that the Valley's prevalence of asthma is higher than the statewide prevalence, this figure is likely a conservative estimate of the toll that asthma-related absences take on local school district revenues.

The high prevalence of asthma in the San Joaquin Valley and research that supports the association between environmental factors and asthma provides support for the growing community concerns that asthma poses a serious threat to the health and well-being of children and adolescents in the San Joaquin Valley and to the economic future of the region.

Asthma Surveillance

Surveillance is critical to advance research on and public health practice with populations who have specific conditions such as asthma. Currently, however, asthma is not a reportable public health condition, making it difficult to produce precise measures about the prevalence of this chronic condition among children and adolescents in the nation, state, and local communities. National statistics used to measure the prevalence of this condition are often extracted from data on general respiratory and allergic conditions.

Presently, surveillance of asthma is limited to analysis of data from ongoing surveys and data systems on health events such as mortality, hospitalization, and outpatient visits. When available, these data are typically several years out of date (U.S. Department of Health and Human Services, 2000). Results from the 2001 California Health Interview Survey (2001 CHIS; UCLA Center for Health Policy Research, 2004) have helped to compensate for the historical absence of detailed regional and local surveillance data.

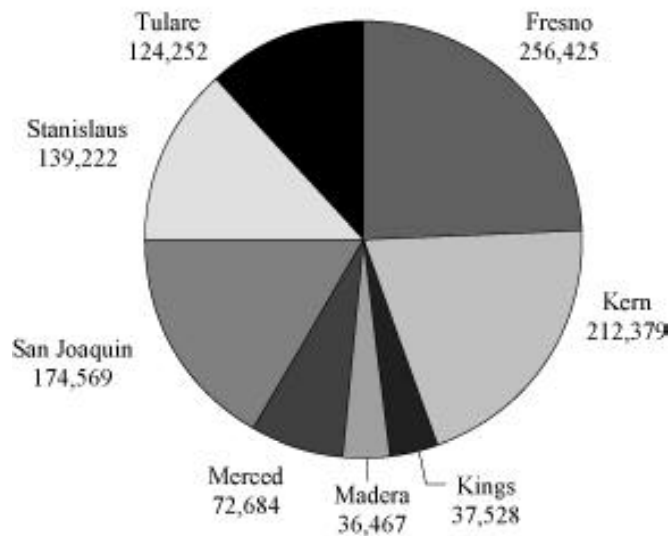


Characteristics of the San Joaquin Valley

The San Joaquin Valley is comprised of eight counties and it extends over 27,000 square miles of Central California. It houses a rapidly growing population that currently exceeds 3.2 million (U.S. Census Bureau, 2003e) and is expected to exceed 4 million by 2010 (California Department of Finance, 2001). The latest Census Bureau data show that in California 27% of the population are chil-

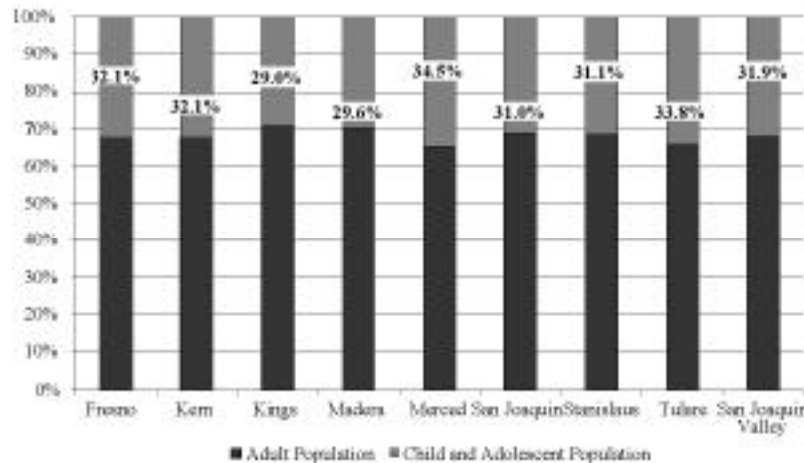
dren, which is the eighth largest population of children under the age of 18 in the United States. Currently, there are an estimated 1 million children and adolescents under age 18 residing in the San Joaquin Valley (see Figure 1; U.S. Census Bureau, 2003d). They represent approximately 30% of the population in each county (Figure 2).

Figure 1
San Joaquin Valley Child and Adolescent Population Ages 0-17, 2000



Source: U.S. Census Bureau, Census 2000 (2003d)

Figure 2
San Joaquin Valley Child and Adolescent Population Ages 0-17 as a Percentage of Total Population, 2000

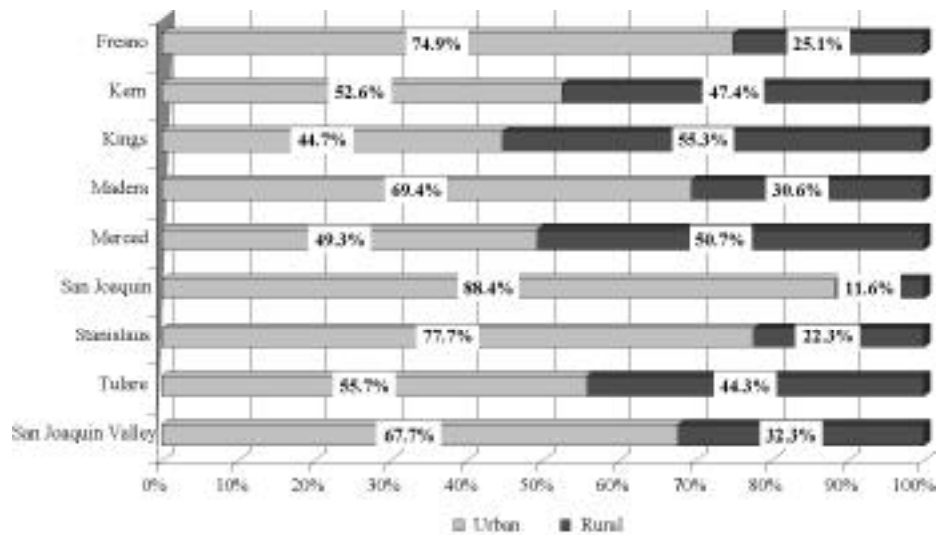


Source: U.S. Census Bureau, Census 2000 (2003d)

Children in rural and urban settings. In the San Joaquin Valley, 3 in 10 children and adolescents live in rural settings (2001 CHIS; UCLA Center for Health Policy Research, 2004). Among the individual counties in the Valley, the percentage of children living in rural settings ranges from 11.6% in San Joaquin County to 55.3% in Kings

County (see Figure 3). Children living in rural settings are more likely to be uninsured than are children living in urban settings (Clark, Savitz, & Randolph, 2001), which places children living in rural settings at higher risk for poor access to medical care and delays in acquiring medical treatment.

Figure 3
San Joaquin Valley Child and Adolescent Population in Urban and Rural Settings, 2001



Source: 2001 California Health Interview Survey



Cultural and ethnic diversity. In addition to being one of the largest rural and agricultural areas in the nation, the San Joaquin Valley is also one of the most ethnically and culturally diverse. Among children and adolescents ages 0-17, Hispanics account for almost half of the child and adolescent population and Caucasians account for a little over one third (U.S. Census Bureau, 2003b; see Figure 4). One in 10 San Joaquin Valley children speaks a language other than English at home (U.S. Census Bureau, 2003a).

Poverty. The San Joaquin Valley is characterized by persistently high levels of poverty. It is estimated that 28% of children ages 0-17 in the San Joaquin Valley live in poverty (U.S. Census Bureau, 2003c). Poverty has been associated with increased health risks due to lack of clean water, adequate sanitation, nutrition, and housing (Porter, Beard, Fox, & Chapman, 2003).

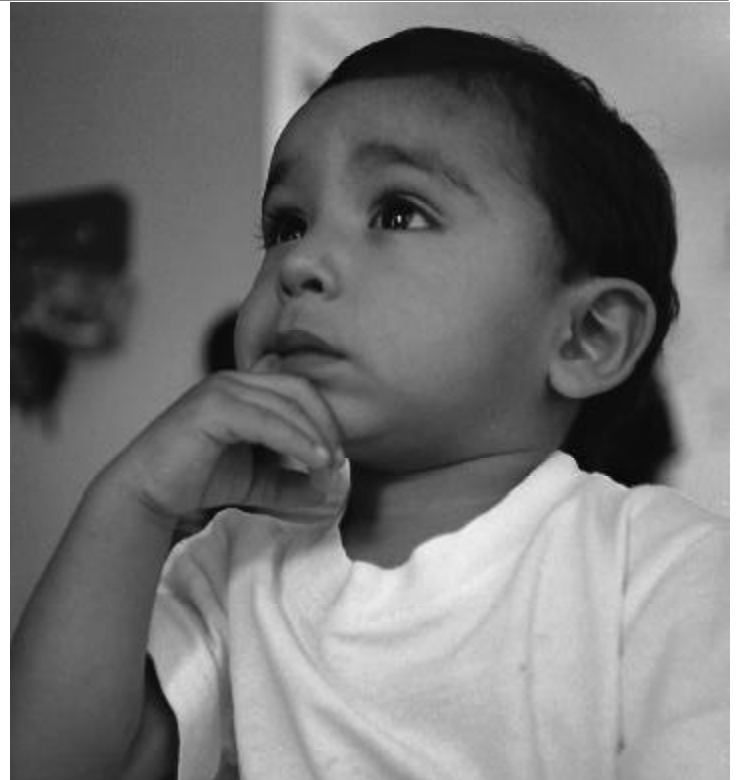
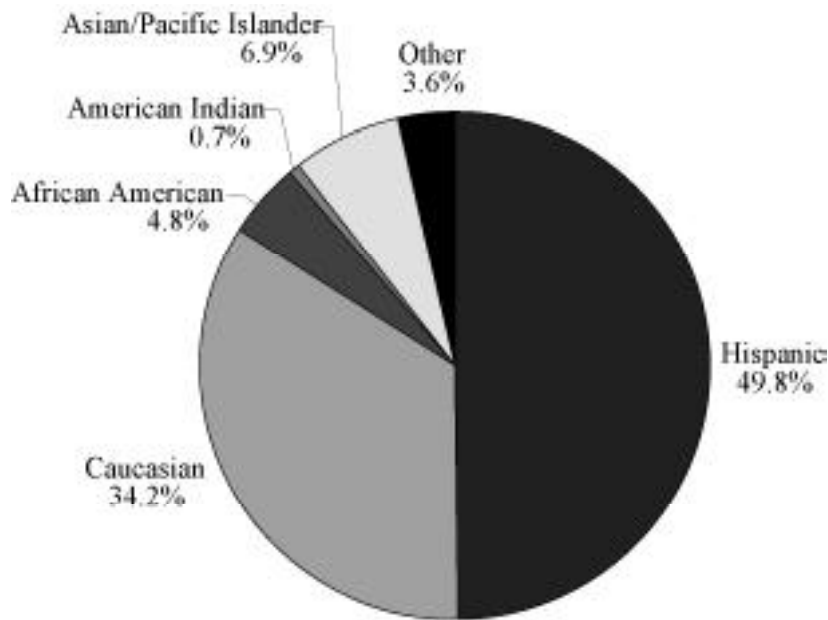


Figure 4
Race/Ethnicity of Children and Adolescents Ages 0-17 in the San Joaquin Valley, 2000



Source: U.S. Census Bureau, Census 2000 (2003b)

Asthma in the San Joaquin Valley

Lifetime Asthma Prevalence

Lifetime asthma prevalence refers to a person being diagnosed with asthma at any time during his or her lifetime. Based on data from the 2001 CHIS, an estimated 15.8% or 157,000 children and adolescents ages 0-17¹ living in the San Joaquin Valley have been diagnosed with asthma by a doctor at some point in their lives. This rate was almost one-fifth higher than the California statewide estimate of 13.6%. Table 1 shows the lifetime asthma prevalence for each county in San Joaquin Valley. Estimated

percentages and numbers are also listed for the San Joaquin Valley and California for the purpose of comparison. Table 1 shows that an estimated 21% of children and adolescents ages 0-17 residing in Fresno County reported that they have been diagnosed with asthma by a doctor at some time in their life. This percentage is 25% higher than San Joaquin Valley estimates and 36% higher than state estimates. In fact, the prevalence rate in every county, with the exception of San Joaquin County, met or exceeded the state's prevalence rate in 2001.

Table 1

Children and Adolescents Ages 0-17 Diagnosed With Asthma, 2001			
Area	Total Child and Adolescent Population Ages 0-17	Number of Children and Adolescents Diagnosed With Asthma	Percent of Children and Adolescents Diagnosed With Asthma
Fresno	245,000	51,000	21.0%
Kern	201,000	29,000	14.5%
Kings	36,000	7,000	20.5%
Madera	34,000	5,000	14.1%
Merced	69,000	11,000	15.9%
San Joaquin	163,000	20,000	12.5%
Stanislaus	129,000	18,000	13.6%
Tulare	117,000	16,000	13.6%
San Joaquin Valley	994,000	157,000	15.8%
California	8,703,000	1,187,000	13.6%

Note: Totals may not be accurate due to rounding errors based on estimates.

Source: 2001 California Health Interview Survey

Age. Because asthma is associated with decreased school attendance, knowing the prevalence of asthma in a county is another way to assess how this disease affects local communities. Lifetime asthma prevalence rates varied among school-aged populations in the San Joaquin Valley in the 2001 CHIS. Among elementary-school-aged children ages 6-11, the lifetime asthma prevalence rate was estimated at 14.8%, and among junior high school students and senior high school students ages 12-17 it was estimated at 17.6%. Among children ages 0-5, lifetime asthma prevalence rate was estimated at 15% (see Table 2).

County of residence was also related to asthma prevalence in specific age groups. For all children and adolescents, ages 0-17, Fresno and Kings County had the highest lifetime asthma prevalence rates in the San Joaquin Valley. Similar patterns followed among children ages 6-11, for whom the asthma prevalence rate in Fresno, Kings, Madera, and Merced County exceeded that of all children ages 6-11 in the San Joaquin Valley. Among adolescents ages 12-17, the lifetime asthma prevalence rate in Fresno, Kern, Kings, and Merced County exceeded the rate of all adolescents ages 12-17 in San Joaquin Valley.

¹ The 2001 CHIS collected data on asthma prevalence rates for ages 1-17.

Table 2

Children and Adolescents Ages 0-17 Diagnosed With Asthma by Age Groups, 2001								
Area	Children Ages 0-5 Ever Diagnosed With Asthma		Children Ages 6-11 Ever Diagnosed With Asthma		Adolescents Ages 12-17 Ever Diagnosed With Asthma		Adolescents Ages 0-17 Ever Diagnosed With Asthma	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Fresno	17,000	24.0%	16,000	18.5%	18,000	21.1%	51,000	21.0%
Kern	7,000*	11.5%*	10,000	13.0%	13,000	18.4%	29,000	14.5%
Kings	2,000	21.5%	2,000	16.3%	3,000	24.2%	7,000	20.5%
Madera	1,000*	7.2%*	2,000*	16.6%*	2,000	16.9%	5,000	14.1%
Merced	1,000*	6.4%*	4,000	15.5%	6,000	24.1%	11,000	15.9%
San Joaquin	5,000*	11.5%*	7,000	11.7%	8,000	14.1%	20,000	12.5%
Stanislaus	3,000*	9.3%*	7,000	13.7%	8,000*	16.6%*	18,000	13.6%
Tulare	6,000	16.7%	6,000	14.9%	4,000*	9.8%*	16,000	13.6%
San Joaquin Valley	42,000	15.0%	54,000	14.8%	61,000	17.6%	157,000	15.8%
California	263,000	10.5%	444,000	13.7%	480,000	16.3%	1,187,000	13.6%

Note: Totals may not be accurate due to rounding errors based on estimates.

* Statistically unstable data

Source: 2001 California Health Interview Survey

Gender. Viewing the lifetime prevalence of asthma by gender offers additional information (see Table 3). For example, both state-wide and in the San Joaquin Valley counties, 6 out of 10 children with asthma were boys. However, when the rates in individual counties were examined, the estimates differed. For example, in San Joaquin County it was estimated that 7 out of 10 children who had been

diagnosed with asthma were boys. In the counties of Stanislaus and Kings, the number of boys diagnosed with asthma was almost double that of girls diagnosed with asthma. Table 3 shows county-specific percentages of boys and girls diagnosed with asthma. California and the San Joaquin Valley percentages are included for comparison.

Table 3

Children and Adolescents Ages 0-17 Diagnosed With Asthma by Gender, 2001					
Area	Male		Female		Total Ages 0-17 Number
	Number	Percent	Number	Percent	
Fresno	30,000	58.2%	21,000	41.8%	51,000
Kern	19,000	63.7%	11,000	36.3%	29,000
Kings	5,000	68.3%	2,000	31.7%	7,000
Madera	3,000	59.9%	2,000	40.1%	5,000
Merced	6,000	59.3%	4,000	40.7%	11,000
San Joaquin	14,000	70.9%	6,000	29.1%	20,000
Stanislaus	12,000	68.3%	6,000	31.7%	18,000
Tulare	9,000	53.3%	7,000	46.7%	16,000
San Joaquin Valley	98,000	62.1%	60,000	37.9%	157,000
California	693,000	58.4%	494,000	41.6%	1,187,000

Note: Totals may not be accurate due to rounding errors based on estimates.

Source: 2001 California Health Interview Survey

Race and ethnicity. Examining lifetime asthma prevalence in relation to specific population characteristics revealed more information about the impact of asthma on children and adolescents in the San Joaquin Valley. There were differences by ethnic group in the proportions of children diagnosed with asthma (see Table 4). For example, among American Indian children living in the San Joaquin Valley, over one third had been diagnosed with asthma. A

similar proportion was seen among African American children. In contrast, among Latino and White children, only 12.3% and 17.5%, respectively, had been diagnosed with asthma. These contrasting proportions suggest that health disparities exist between American Indian and African American children, and children from other racial and ethnic groups.

Table 4

Lifetime Asthma Prevalence by Ethnicity Among San Joaquin Valley Children and Adolescents Ages 0-17, 2001			
Ethnicity	Number Diagnosed With Asthma	Percent Diagnosed With Asthma	Total (Ages 0-17)
Latino	53,000	12.3%	428,000
American Indian	3,000	36.4%	8,000
Asian	5,000*	9.4%*	51,000
African American	18,000	34.8%	53,000
White	75,000	17.5%	431,000
Other	4,000*	14.8%*	24,000
All	157,000	15.8%	994,000

Note: Totals may not be accurate due to rounding errors based on estimates.

* *Statistically unstable data*

Source: 2001 California Health Interview Survey

Income. Lifetime asthma prevalence was examined in the context of family income, which is measured in relation to the federal poverty level. As is shown in Table 5, the highest percentage of children and adolescents diag-

nosed with asthma in the San Joaquin Valley came from families whose annual income was over 200% of the federal poverty level, not from those families with the lowest incomes.

Table 5

San Joaquin Valley Children and Adolescents Ages 0-17 Diagnosed With Asthma by Family Income as Percentage of the Federal Poverty Level, 2001			
Federal Poverty Level	Number	Percent	Total Ages 0-17
0-99% FPL	35,000	11.8%	299,000
100-199% FPL	41,000	16.2%	253,000
200-299% FPL	34,000	20.3%	167,000
300% FPL and above	47,000	17.2%	275,000
Total	157,000	15.8%	994,000

Note: Totals may not be accurate due to rounding errors based on estimates.

Source: 2001 California Health Interview Survey

Place of residence. Lifetime asthma prevalence was also examined in the context of urban and rural communities. Although a larger number of San Joaquin Valley children and adolescents who had been diagnosed with asthma lived

in urban communities, there were approximately one in seven children and adolescents diagnosed with asthma in both rural and urban settings.

Table 6

San Joaquin Valley Children and Adolescents Ages 0-17 Diagnosed With Asthma by Place of Residence, 2001			
Place of Residence	Number	Percent	Total
			Ages 0-17
Urban	107,000	15.9%	670,000
Rural	51,000	15.8%	322,000
Total	157,000	15.9%	992,000

Note: Totals may not be accurate due to rounding errors based on estimates.

Source: 2001 California Health Interview Survey

Asthma Symptom Prevalence

Asthma symptom prevalence refers to a person being diagnosed with asthma at any time during his or her lifetime and experiencing asthma symptoms at least once in the 12 months preceding the 2001 CHIS interview. Asthma symptom prevalence is a reflection of both the severity of the condition, one’s exposure to environmental triggers, and the effectiveness of management strategies. The extent or prevalence of asthma symptoms experienced by children and adolescents in the San Joaquin Valley counties is displayed in Table 7.

In 2001, the asthma symptom prevalence in every San Joaquin Valley county, except Stanislaus County, exceeded that of the State of California as a whole. Fresno and Kings County had the highest rate of child and adolescent asthma symptom prevalence in the San Joaquin Valley. One in six children and adolescents in Fresno County and one in seven children and adolescents in Kings County experienced symptoms of asthma. This high percentage of children and adolescents diagnosed with asthma who experienced asthma symptoms may indicate poor access to primary care or asthma medications and unmet needs within the asthma care system.

Table 7

Asthma Symptom Prevalence Among San Joaquin Valley Children and Adolescents Ages 0-17, 2001	
Area	Percent
Fresno	16.4%
Kern	10.0%
Kings	14.7%
Madera	11.1%
Merced	11.8%
San Joaquin	10.1%
Stanislaus	9.3%
Tulare	10.5%
San Joaquin Valley	12.5%
California	9.6%

Note: Totals may not be accurate due to rounding errors based on estimates.

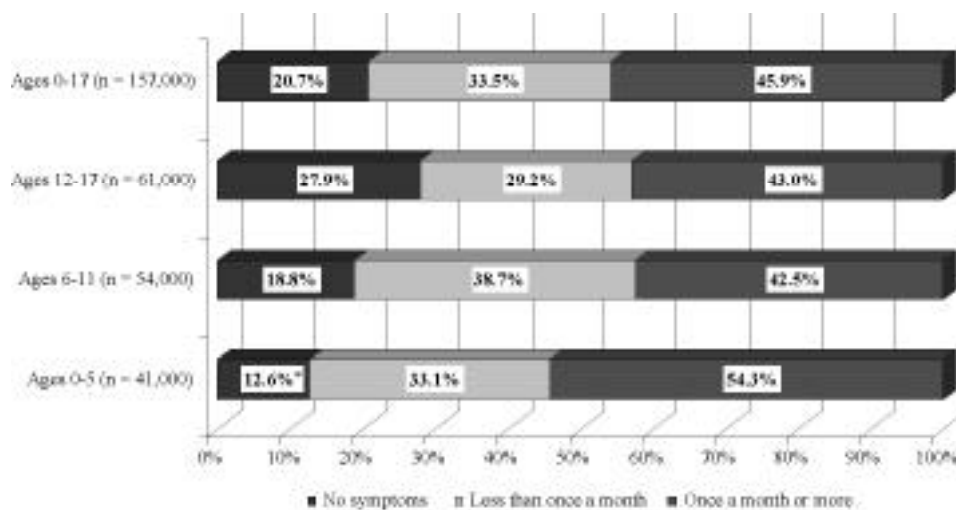
Source: Brown, Meng, Babey, and Malcolm (2002)

Knowing the frequency of asthma symptoms among children and adolescents in the San Joaquin Valley can help professionals and local communities predict the extent of need in terms of inpatient and outpatient treatment for asthma symptoms, and the associated social and academic costs when asthma symptoms are not managed effectively. In this report, data are reported on the percentage of children and adolescents diagnosed with asthma who reported the following symptom frequency: (a) no symptoms, (b) symptoms less than once a month, and (c) symptoms once a month or more. These data are reported for children and adolescents ages 0-17, and for children ages 0-5 and 6-11 and for adolescents ages 12-17, where a more detailed age breakdown is warranted or available. County-specific es-

timates on the frequency of asthma symptoms were not analyzed.

Age. In the San Joaquin Valley, 73,000 children and adolescents ages 0-17 experienced asthma symptoms once a month or more. This represented 45.9% of the children and adolescents who have been diagnosed with asthma. When examining separate age groups, the percentages of children ages 6-11 and adolescents ages 12-17 who experienced asthma symptoms once a month or more were similar. The youngest children diagnosed with asthma, those ages 0-5, reported symptoms most frequently, with over half experiencing symptoms once a month or more (see Figure 5).

Figure 5
Frequency of Asthma Symptoms by Age Among San Joaquin Valley Children and Adolescents Ages 0-17 Diagnosed with Asthma, 2001



*Note: Totals may not be accurate due to rounding errors based on estimates.
 * Statistically unstable data*

Source: 2001 California Health Interview Survey



Gender. Although more male children and adolescents had been diagnosed with asthma, evidence suggests that females experienced symptoms more frequently than did males. An example of this is the 12-17 age group, in which 49.2% of the girls compared to 38.2% of the boys who had been diagnosed with asthma reported experiencing symptoms once a month or more (see Table 8).

Table 8

Frequency of Asthma Symptoms by Gender Among San Joaquin Valley Children and Adolescents Ages 0-17 Diagnosed With Asthma, 2001									
		No Symptoms		Less Than Once a Month		Once a Month or More		Total Diagnosed With Asthma	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent
Ages 0-17	Male	21,000	22.0%	33,000	33.5%	43,000	44.4%	97,000	99.9%
	Female	11,000	18.4%	20,000	33.6%	29,000	48.1%	60,000	100.1%
Ages 12-17	Male	11,000	31.1%	11,000	30.6%	14,000	38.2%	36,000	99.9%
	Female	6,000	23.2%	7,000	27.1%	13,000	49.8%	26,000	100.1%
Ages 6-11	Male	8,000	22.3%	12,000	33.8%	16,000	44.0%	36,000	100.1%
	Female	2,000	12.0%	9,000	48.2%	8,000	39.8%	19,000	100.0%
Ages 0-5	Male	2,000	9.0%	10,000	37.0%	14,000	53.9%	26,000	99.9%
	Female	3,000	18.3%	4,000	26.7%	9,000	53.2%	16,000	98.2%

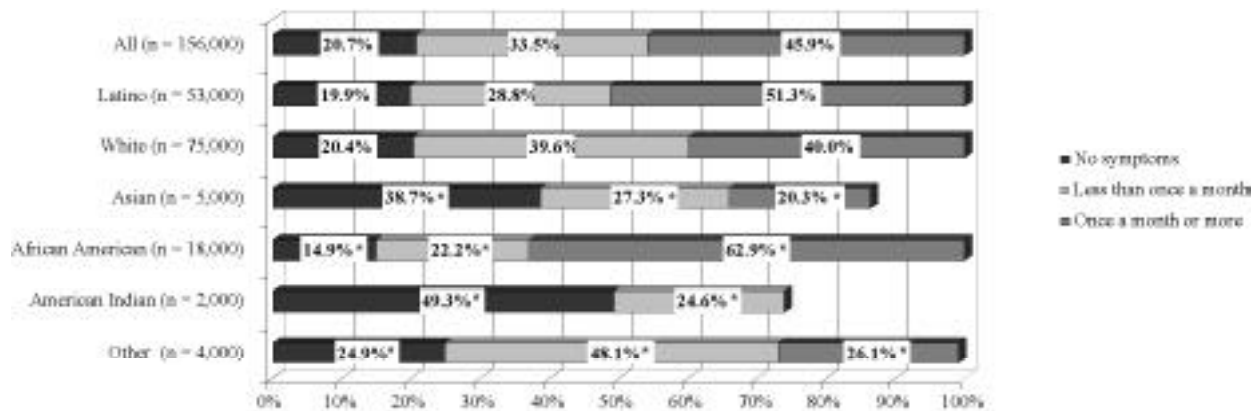
Note: Totals may not be accurate due to rounding errors based on estimates.

Source: 2001 California Health Interview Survey

Race and ethnicity. Among children and adolescents ages 0-17, a higher percentage of African American children diagnosed with asthma experienced symptoms once a month or more than did children and adolescents from other ethnic groups. Over half of the Latino children and adolescents and almost two-thirds of African American children and adolescents diagnosed with asthma experienced symptoms once a month or more (see Figure 6). Although

there were insufficient data to explore symptom prevalence in San Joaquin Valley American Indian children, it is important to note that statewide data showed that American Indian children had one of the highest frequencies of asthma symptoms among the ethnic groups, with 37.9% of those diagnosed with asthma experiencing symptoms once a month or more (2001 CHIS; UCLA Center for Health Policy Research, 2004).

Figure 6
Frequency of Asthma Symptoms by Ethnicity Among San Joaquin Valley Children and Adolescents Ages 0-17 Diagnosed with Asthma, 2001



Note. Due to the small sample size, estimates for San Joaquin Valley Asian and American Indian children and adolescents are unavailable or are unstable.

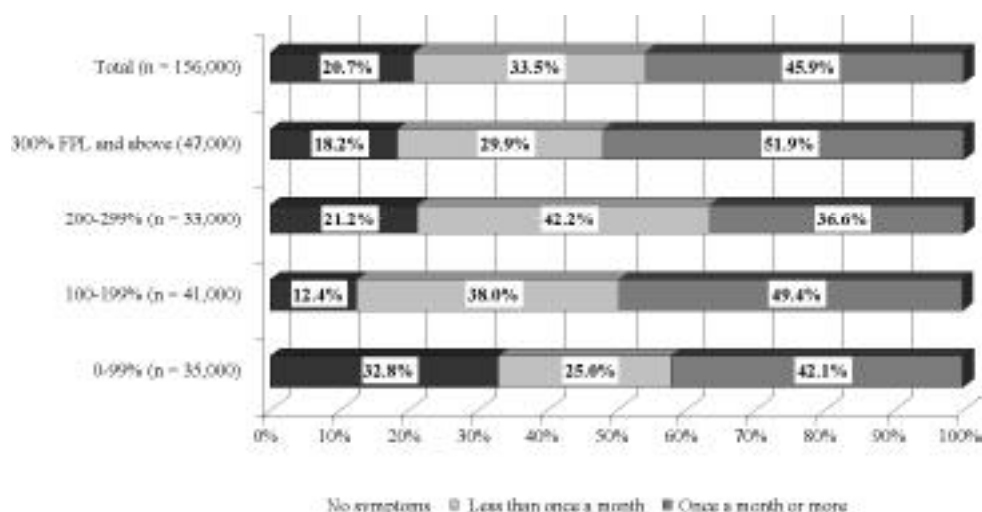
* Statistically unstable data

Source: 2001 California Health Interview Survey

Income. Children and adolescents ages 0-17 from families with incomes at 300% of the federal poverty level and above had the highest percentage of asthma symptoms occurring once a month or more. Over half of children and adolescents diagnosed with asthma from families with incomes at 300% of the federal poverty level and above experienced symptoms once a month or more. A smaller

proportion of children and adolescents from households with incomes below 200% of the federal poverty level experienced frequent asthma symptoms (see Figure 7). This finding is interesting given that children from families with higher incomes are more likely to have access to asthma care and management systems than are children from families with lower incomes.

Figure 7
Frequency of Asthma Symptoms by Federal Poverty Level Among San Joaquin Valley Children and Adolescents Ages 0-17 Diagnosed with Asthma, 2001

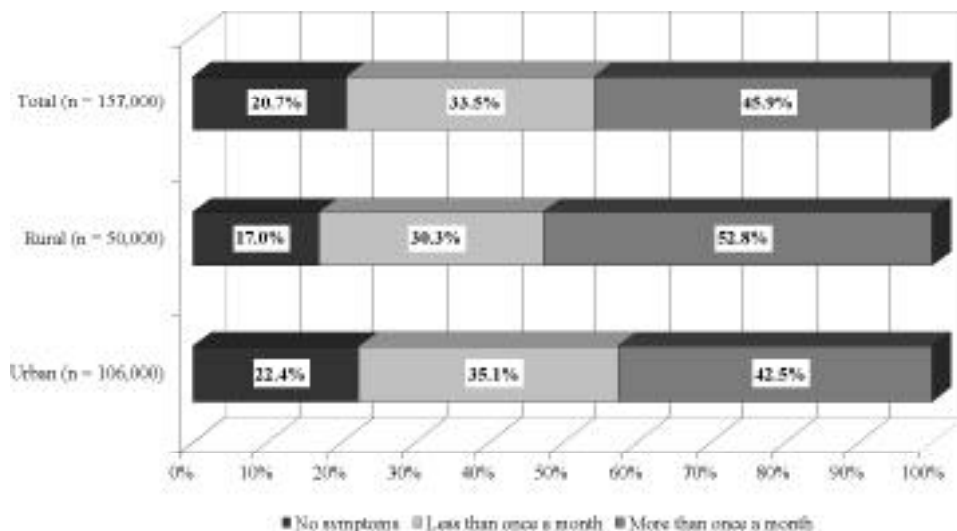


Source: 2001 California Health Interview Survey

Place of residence. Frequency of asthma symptoms in the San Joaquin Valley was also examined within the context of place of residence, comparing children who resided in rural and in urban communities (see Figure 8). Among the estimated 50,000 children and adolescents ages 0-17 diagnosed with asthma and living in rural settings, 52.8% experienced symptoms once a month or more. In comparison, 42.5% of children and adolescents diagnosed with asthma who live in urban settings experienced symptoms once a month or more.



Figure 8
Frequency of Asthma Symptoms by Place of Residence Among San Joaquin Valley Children and Adolescents Ages 0-17 Diagnosed with Asthma, 2001

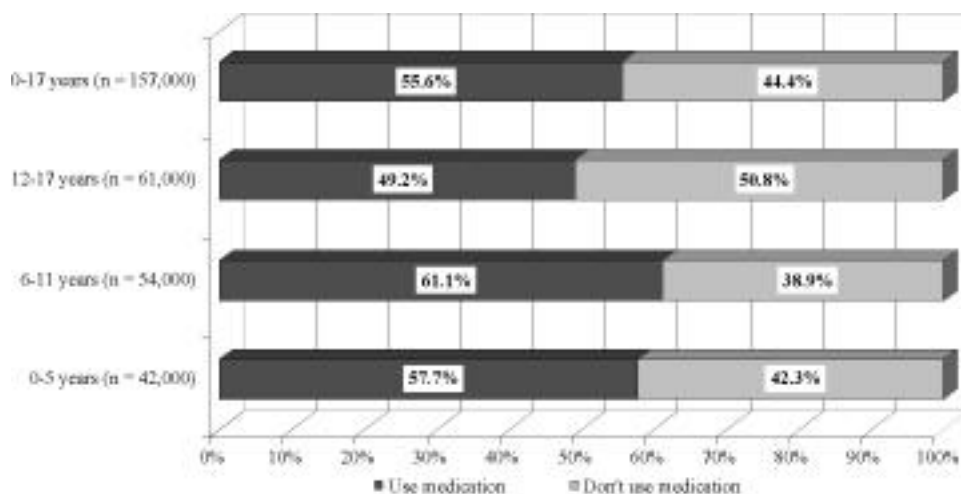


Source: 2001 California Health Interview Survey

Use of medication to control asthma symptoms. Experiencing frequent asthma symptoms may be related to inadequate medical control of the disease, exposure to environmental triggers, and increased severity of this chronic disease (Brown et al., 2002). Possible evidence of inadequate control is reflected in the frequency of symptoms among children who took medication for asthma.

An estimated 87,000 San Joaquin Valley children and adolescents ages 0-17 diagnosed with asthma reported taking medication to control their asthma symptoms (2001 CHIS; UCLA Center for Health Policy Research, 2004). This number represented over one half of all children and adolescents diagnosed with asthma (see Figure 9). Figure 9 also shows that younger children (ages 0-11) used medication for the treatment of asthma at a higher rate than did adolescents ages 12-17.

Figure 9
San Joaquin Valley Children and Adolescents Ages 0-17 Who Were Diagnosed With Asthma and Take Medication to Control Asthma Symptoms, 2001



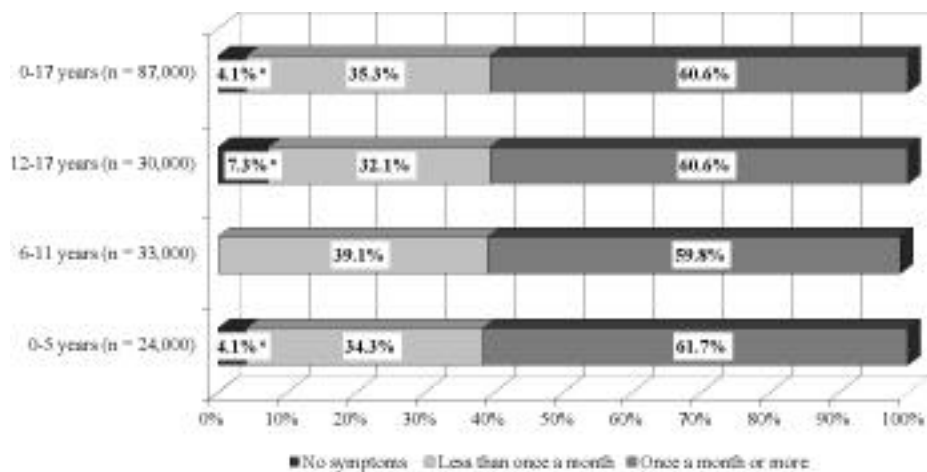
Source: 2001 California Health Interview Survey

Of the estimated 87,000 children and adolescents ages 0-17 who were diagnosed with asthma and reported taking medication for asthma, 60.6% experienced symptoms once a month or more (see Figure 10). This means that asthma symptoms were not well controlled, even by medication, in over 50,000 San Joaquin Valley children and adolescents. Although it is likely that the severity of asthma was

greater among children and adolescents who used medication to manage this condition, these data indicate that asthma symptoms continued to occur frequently in the lives of many San Joaquin Valley children and adolescents who took medication to control asthma symptoms. The potential for disrupted family, school, and day care routines is evident.

Figure 10

Frequency of Asthma Symptoms Among San Joaquin Valley Children and Adolescents Ages 0-17 Who Were Diagnosed With Asthma and Take Medication to Control Asthma Symptoms, 2001



* Statistically unstable data

Source: 2001 California Health Interview Survey

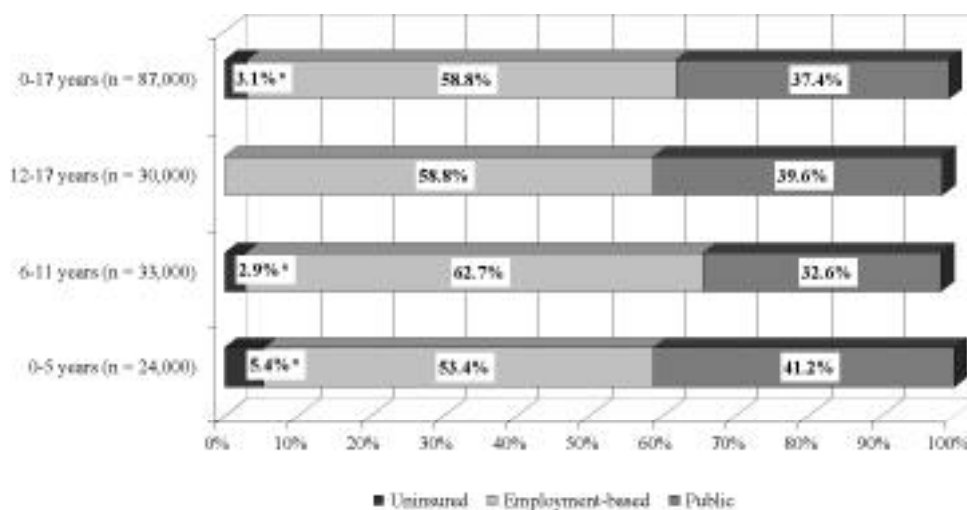


Medication Use and Health Insurance

The majority of children and adolescents ages 0-17 living in the San Joaquin Valley who were diagnosed with asthma and reported taking medication to control their asthma symptoms were insured by either a public (e.g., Medicaid [Medi-Cal] and CHIP [Healthy Families]; 37.4%) or an employment-based (58.8%) health insurance program (2001 CHIS; UCLA Center for Health Policy Research,

2004). Figure 11 shows these data by specific age groups. Almost all (96.9%) children and adolescents ages 0-17 in the San Joaquin Valley who reported taking medication for asthma had some type of health care coverage. Even with health insurance coverage the high costs of copayments, deductibles, and uncovered expenses may serve as a deterrent to seeking care and treatment, as does not having insurance.

Figure 11
Health Insurance Coverage Among Children Who Were Diagnosed With Asthma and Take Medication to Control Asthma Symptoms, 2001



*Statistically unstable data

Source: 2001 California Health Interview Survey

Emergency Room Visits

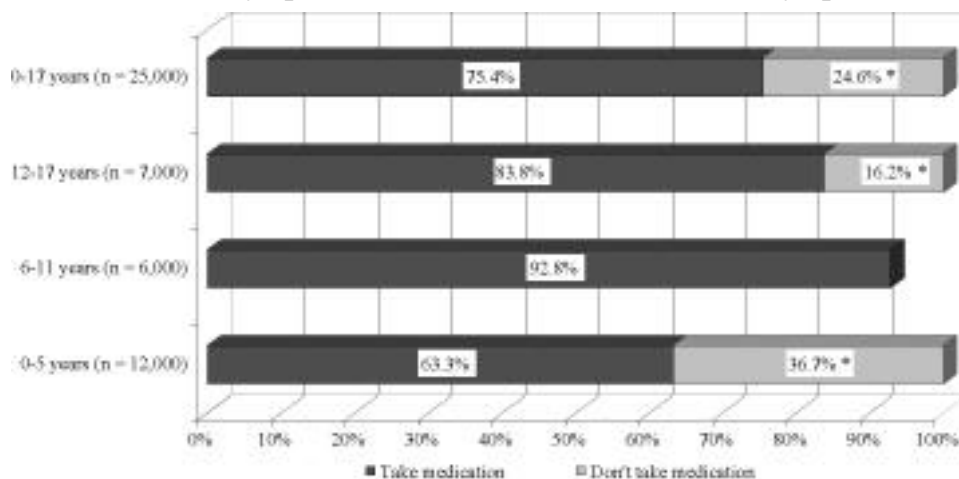
When asthma symptoms become unmanageable at home or school, children and adolescents often seek care in a hospital emergency department. Asthma accounted for an estimated 11.9% of emergency room visits for children and adolescents ages 0-17 diagnosed with asthma (2001 CHIS; UCLA Center for Health Policy Research, 2004). This translated into an estimated 25,000 emergency room visits across the San Joaquin Valley in the 12 months prior to the 2001 CHIS interview.

Many of these emergency room visits were made by children and adolescents who experienced uncontrollable symptoms and reported taking asthma medication. Three in four (75.4%) children and adolescents ages 0-17 diagnosed with asthma who visited an emergency room for asthma symptoms reported taking medication (2001 CHIS;

UCLA Center for Health Policy Research, 2004). The percentage of children who reported taking medication was even higher in school-age children, as 92.8% of children ages 6-11 diagnosed with asthma who visited an emergency room for asthma symptoms were taking medication (see Figure 12).

Need for emergency asthma care among children and adolescents who take medication may be an indicator of limited access to care providers, limited patient education on symptom management, inadequate monitoring, and asthma symptoms being difficult to control in some children, even when medication has been prescribed. Furthermore, these findings may reflect inadequate understanding of or adherence to treatment regimens by children and their families.

Figure 12
San Joaquin Valley Children and Adolescents Ages 0-17 Diagnosed With Asthma Who Visited an Emergency Room for Asthma Symptoms and Take Medication to Control Symptoms, 2001



* Statistically unstable data
 Source: 2001 California Health Interview Survey

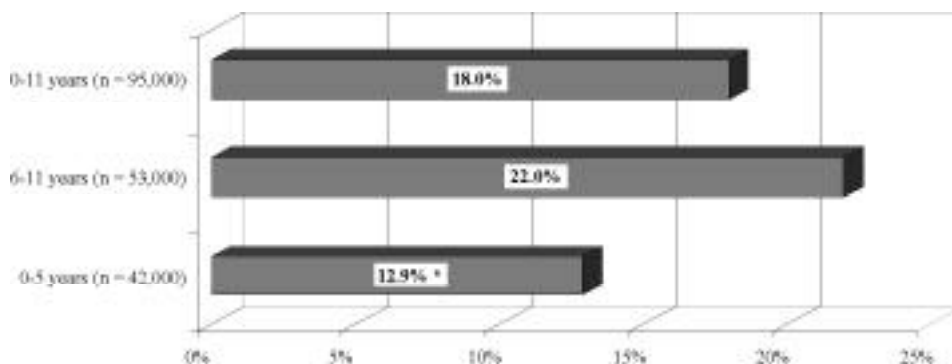
Some emergency room visits for asthma resulted in hospitalizations. An estimated 4,000 San Joaquin Valley children and adolescents ages 0-17 diagnosed with asthma were hospitalized for this condition at least once during the 12 months prior to the 2001 CHIS (2001 CHIS; UCLA Center for Health Policy Research, 2004). Although 4,000 admissions represents a small percentage (2.5%) of the 157,000 Valley children and adolescents who have been diagnosed with asthma, acute hospital admission indicates severe asthma symptoms requiring inpatient medical care and supervision. In summary, these findings raise further concern that many children and adolescents who take medi-

cation for asthma do not achieve sufficient control of asthma symptoms, requiring emergency-room care and acute hospital care.

Physical Limitations Related to Asthma

Asthma symptoms sometimes limit or prevent children and adolescents from engaging in activities that are considered usual for their age. Figure 13 shows the percentage of children and adolescents ages 0-11 diagnosed with asthma that were so affected by this chronic disease that it limited or prevented them from engaging in activities at home and at school.

Figure 13
San Joaquin Valley Children and Adolescents Ages 0-17 Whose Asthma Limits or Prevents Activities That Are Usual for Their Age, 2001



* Statistically unstable data
 Source: 2001 California Health Interview Survey

Limitations due to asthma also affect the school experience. It was estimated that approximately 30.8% of adolescents ages 12-17 diagnosed with asthma missed one to two days of school every month because of their health condition (2001 CHIS, UCLA Center for Health Policy Research, 2004). Compromised physical activity and school absences due to asthma symptoms can affect the academic performance of students regardless of their age and reduce opportunities for these children and adolescents to interact with peers in the classroom, on the playing field, or in extracurricular activities.

Patient Education

Health care providers can provide key information on activity limits and monitoring symptoms to help children and adolescents learn how to manage this health condition. Data about how well-informed young patients were about their asthma condition were only available for adolescents

ages 12-17. These data were examined to assess how many adolescents had been informed about how to prevent asthma from worsening and how to recognize the onset of asthma symptoms.

It was estimated that over half (57.5%) of San Joaquin Valley adolescents diagnosed with asthma had been informed by their physician about how to prevent asthma from worsening. Nevertheless, a large proportion of adolescents had not been educated about preventative measures they could take to abate the effects of asthma. It was also estimated that over half (55.2%) of these adolescents had not been educated by their doctors about how to recognize asthma symptoms (2001 CHIS; UCLA Center for Health Policy Research, 2004). These findings have implications for frequency of symptoms, medication use, emergency room use, and hospitalization for uncontrollable asthma.



Summary of Findings

Summary of Findings

Asthma Prevalence Reaching Epidemic Proportions

The prevalence of asthma among children and adolescents in the San Joaquin Valley has reached epidemic proportions, with one in six children in the Valley having been diagnosed with asthma at some point in his or her lifetime. The expanding child population in the Valley increases the likelihood that even more children and adolescents will be diagnosed with this chronic disease, thereby further taxing publicly funded and privately supported medical resources. The forecasted costs associated with an expanding population and the broader need for treating asthma adds to the urgency of abating this epidemic.

The frequency at which asthma symptoms occurred among children and adolescents diagnosed with asthma in the Valley is stunning. An even more dramatic statistic is that three in five children and adolescents diagnosed with asthma who take medication for this condition continued to experience asthma symptoms once a month or more.

Disparities in Asthma Prevalence

The prevalence of asthma in the San Joaquin Valley is characterized by disparities in age, gender, and ethnicity. Lifetime prevalence rates are higher among San Joaquin Valley adolescents ages 12-17 than they are among younger children. The findings of this report show that asthma was slightly more common among boys than it was among

girls, as over 60% of children ever diagnosed with asthma in the San Joaquin Valley were boys. Furthermore, a higher proportion of children and adolescents from African American and American Indian backgrounds than from other racial or ethnic groups have been diagnosed with asthma.

When examining estimates of lifetime asthma prevalence by place of residence, rates of lifetime asthma prevalence were similar in urban and rural settings. An unexpected finding was the relatively low rates of lifetime asthma prevalence and asthma symptom prevalence among children from families with lower income. This may be related to the lower rates of lifetime asthma prevalence among Latino and Asian children, who together accounted for 74.5% of the children from low-income families (i.e., 0-99% FPL).

Disparities in Asthma Management

Disparities by age, gender, ethnicity, and place of residence were also apparent in asthma management. Frequency of asthma symptoms are an important indicator of the adequacy of asthma management.

When examining San Joaquin Valley children and adolescents by age groups, two in five children ages 6-11 diagnosed with asthma experienced asthma symptoms once a month or more. This ratio was even higher among children ages 0-5 diagnosed with asthma; one in two children in this age group experienced symptoms once a month or more.

Although more San Joaquin Valley boys than girls were diagnosed with asthma, girls seemed to experience symptoms more frequently. Among children diagnosed with asthma, girls, especially girls ages 6-11 and 12-17, experienced asthma symptoms more frequently than did boys.

Although there were unmet needs in asthma management for many San Joaquin Valley children, there was a disproportionate representation of children from Latino and African American groups with these unmet needs. Over half of the Latino children and adolescents and almost two-thirds of African American children and adolescents diagnosed with asthma experienced symptoms once a month or more, compared to 40% of White children and adolescents. Although there were insufficient data on American Indian children in the San Joaquin Valley to draw a definitive conclusion, statewide trends suggested that American Indians also experienced similar disparities in the frequency



of asthma symptoms. The disproportionate distribution of lifetime asthma and asthma symptom prevalence among the various ethnic groups underscores the disparate way in which this chronic disease affects children of color.

Disparities in the frequency of asthma symptoms were also detected in relationship to the types of communities in which children and adolescents resided in the San Joaquin Valley, with those who lived in rural settings reporting more frequent asthma symptoms than those who lived in urban settings.

Symptom management. Other findings associated with the frequency of asthma symptoms raised concerns about how effectively these symptoms were being managed with medication. A total of 87,000 children, over half of children and adolescents ages 0-17 and almost two-thirds of children ages 6-11 diagnosed with asthma, reported taking medication to control asthma symptoms.

An analysis of the estimated 25,000 children and adolescents who visited an emergency room in the 12 months prior to the 2001 CHIS showed that 75.4% were taking medications to control asthma symptoms. This proportion was even higher among school-aged children ages 6-11 (92.8%). In addition, an estimated 4,000 children and adolescents were hospitalized for asthma symptoms in the same 12-month period. These findings may indicate inadequate control, poor understanding, and poor adherence to treatment regimens.

The extent of uncontrolled asthma symptoms among children and adolescents in the San Joaquin Valley suggests a need for more systematic surveillance and monitoring, consistent patient education, and regular follow-up to manage this chronic condition. Health care providers, educators, and social service professionals must work together with children, adolescents, and their families to more effectively manage asthma. Local, regional, and county decision-makers must work together to more clearly identify unmet needs and the extent of resources needed to reduce the prevalence of asthma symptoms among the youngest residents of the San Joaquin Valley.

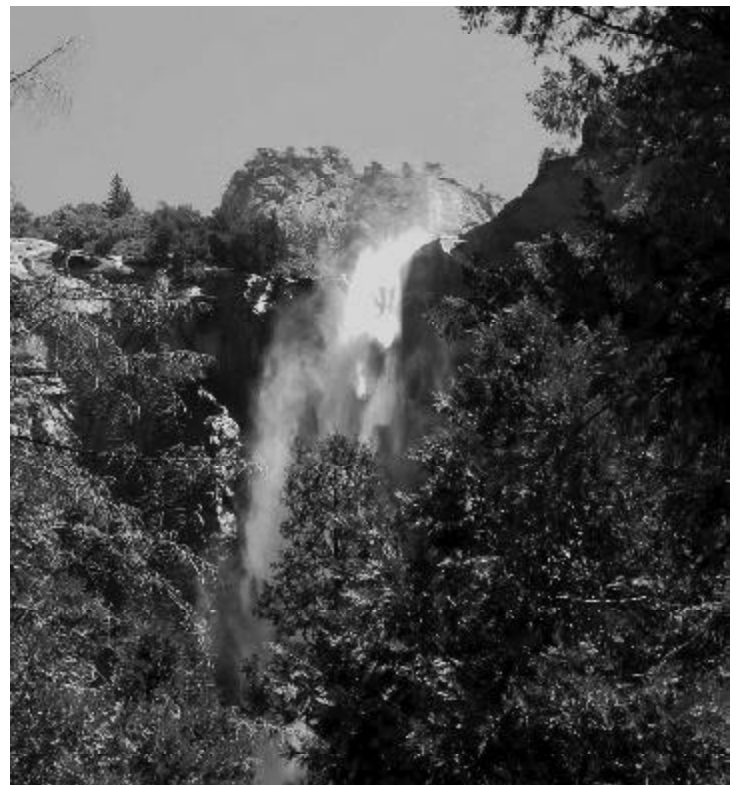
Costs of Asthma to the San Joaquin Valley Region

One in eight San Joaquin Valley children and adolescents ages 0-17 experienced asthma symptoms at least once a year. Frequency and severity of asthma symptoms among children and adolescents have obvious implications for critical activities in their lives, such as social interaction, school attendance, and academic achievement. Disrup-

tions in daily routines affect not only the child or adolescent but also the employment, work productivity, income-earning capacity, and quality of life of families.

Clearly, the prevalence of asthma among children and adolescents residing in the San Joaquin Valley has reached epidemic proportions; however, the costs of this epidemic have yet to be totaled. Some of these children and adolescents suffer unmanageable symptoms that require intensive medical care in both inpatient and outpatient settings. Health care costs, the loss of revenue to local school districts from high absenteeism, the disruption of family employment, and related threats to the economic well-being of families are all short-term costs of this epidemic. The potential long-term costs of asthma include lower academic achievement, lost economic participation, lower productivity, and stunted economic growth of communities in the San Joaquin Valley.

Projected population growth combined with the poor air quality in the San Joaquin Valley threatens to continue to compromise or restrict the health, well-being, and academic progress of a growing number of children and adolescents. Increasing demands for emergency health care and the chronic management needs required by children with asthma threaten to burden an already taxed health care system. The end effect is a health care crisis that threatens to have exponential and far-reaching effects for families and communities in the San Joaquin Valley.



Recommendations

The high prevalence of childhood asthma requires action to develop and implement policy that will provide for the detection, monitoring, and critical and timely management of asthma symptoms for children in this region. Valley policy-makers must address efforts to identify children at risk and provide needed care for children and adolescents with asthma, as well as reduce asthma triggers such as poor air quality. It will take systematic and coordinated efforts to monitor and ultimately reduce asthma-related school absences, emergency room visits, and hospitalizations. Ultimately, the goal is to reduce the number of new cases of childhood asthma in this region. In spite of local and regional efforts to manage and reduce the prevalence of asthma and related symptoms, the findings in this report point to a growing crisis with tremendous social, health, educational, and economic implications for the San Joaquin Valley.

The following recommendations for action are proposed:

Expand Detection and Surveillance for Young Children

- Medical communities and advocacy groups in the San Joaquin Valley should aggressively promote the diagnosis and treatment of asthma among children, especially those in the 0-5 age group.

Focus State, Regional, and Local Efforts on Disparities in Asthma Prevalence and Management

- Children who reside in the San Joaquin Valley are more likely to have asthma and experience asthma symptoms more frequently than are children statewide. Priority should be placed on the importance of public education, asthma detection, and management strategies for this chronic condition for all children in the San Joaquin Valley.
- The disproportionate rates of lifetime asthma prevalence among African American and American Indian children and adolescents should be viewed as a major health disparity that requires a rapid response by local communities in which these disparities occur.
- The disproportionate rates of frequent asthma symptoms among Latino and African American children also indicate disparities in asthma management that require attention.

- Strategies for asthma detection and management in the San Joaquin Valley must be designed and implemented with consideration for the ethnic and cultural diversity of San Joaquin Valley families.
- Collaborative strategies are needed to reach out to children, adolescents, their parents, and their families. Health care providers, school health personnel, and media sources all play important roles in stressing the importance of asthma diagnosis, patient and family education, and strategies to insure the effective management of symptoms.

Formalize the Role of School Health Personnel in the Surveillance and Management of Asthma

- Asthma-related school absences represent a significant cost to local school districts. Mechanisms to track and report these absences would provide much needed data for policy-makers, administrators, educators, health professionals, and concerned parents to take more focused action in local communities.
- Recent legislative efforts at the state level are beginning to address the need for statewide policy to define the role of school health personnel in the surveillance and management of asthma. Optimizing the quality of indoor air in the school environment is also part of this legislative package (Richman, 2004). These steps provide a clear focus for continued efforts to address and stem the tide of this growing epidemic.

Establish Local, Regional, and Statewide Surveillance Systems to Detect, Monitor, and Track the Progress of Systems of Care

- As recommended by the U.S. Department of Health and Human Services (2000), a systematic approach to asthma surveillance would identify high-risk populations and high-risk factors, which would assist in the development of public health interventions and assessment of health programs and environmental controls such as for air quality.
- Systematic surveillance of asthma by local authorities is a priority and is needed to measure accurately its effects on the lifestyle and activities of daily living of children and adolescents diagnosed with this con-

dition. Asthma-related school absences need to be closely monitored. External funding for tracking the prevalence of asthma among children and adolescents must be sought for this activity.

- Timely data on asthma at the state and local level will support efforts to explore the relationship between asthma morbidity and mortality and age, ethnicity/race, gender, income level, and place of residence, and support the development of effective public health interventions for communities in the San Joaquin Valley.

Keep Environmental Policy Issues in the Forefront

- Poor indoor and outdoor air quality make asthma symptoms worse. Recent legislation has begun to address measures to improve air quality in the San Joaquin Valley. Governmental regulations, sanctions, and incentives; school policy; business practices; and individual choices all play a part in improving air quality. Education, advocacy, and media attention have been effective in raising public support for some of these strategies. These efforts must continue on behalf of the 157,000 San Joaquin Valley children and adolescents with asthma.

Conclusion

This report describes the prevalence of asthma and frequency of asthma symptoms among children and adolescents in the San Joaquin Valley. Disparities among children and adolescents with asthma were observed across age, gender, ethnicity, and place of residence. The findings of this report imply that further study, targeted action, and public health surveillance are needed to more adequately grapple with the broad effects of asthma. These effects include (a) an increased burden on the health care system because of inadequate detection and unmanageable symptoms; (b) the loss of local school district revenues due to of asthma-related absences; (c) the risk of low academic achievement and limited physical, social, and emotional development opportunities among children and adolescents due to poor symptom management and restricted activity; and (d) the reduced productivity related to providing care to children who experience asthma symptoms and its economic impact on parents, their families, and their employment. Viewed in this manner, these ef-

fects are far reaching and beyond the scope of this report, but they are relevant issues that warrant further study. In the meanwhile, aggressive efforts to monitor and manage asthma symptoms and control environmental conditions that trigger the onset of asthma symptoms are critical steps in managing this epidemic. Environmental policy, agricultural activities, urbanization, population growth, interstate traffic on nearby highways, the geography of the Valley, and the state and local budget issues all require consideration in solutions generated to grapple with the high prevalence of asthma and asthma symptoms.

The future for children with asthma in the San Joaquin Valley remains uncertain. The forecasted population expansion of the San Joaquin Valley underscores the need to prioritize this problem in education, health, social, and environmental policy. The future of the Valley depends on it.

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