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The Los Angeles County Health Survey is a periodic, population-based telephone survey that collects information on sociodemographic characteristics, health status, health behaviors, and access to health services among adults and children in the county. The 2002–2003 survey collected information on a random sample of 8,167 adults and 5,995 children. Interviews were offered in English, Spanish, Cantonese, Mandarin, Korean, and Vietnamese. The most recent survey was supported by grants from First 5 LA, the California Department of Health Services through grants to the Family Health, Tobacco Control and Prevention, and Alcohol and Drug Programs, and the Public Health Response and Bioterrorism Preparedness federal grant. The survey was conducted for the Los Angeles County Department of Health Services between October 2002 and March 2003 by Field Research Corporation.

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**Acknowledgements**

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Special thanks to Anna Long, PhD, MPH; Jean Armbruster, MA; Wendy Schiffer, MSPH; and Alex Chen, MD for their contributions to this report.

**For additional information about the  
L.A. Survey: [www.lapublichealth.org/ha](http://www.lapublichealth.org/ha)**



October 2004

# CHILDHOOD ASTHMA

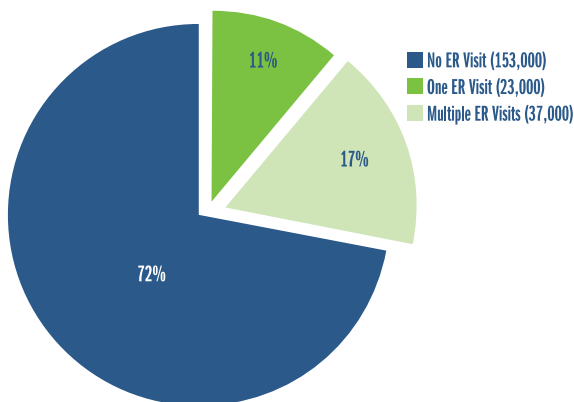
Asthma is a leading cause of chronic illness among children and adolescents in the United States. Nationwide, asthma was the third leading cause of hospitalization among children 15 years and younger.<sup>1</sup> In Los Angeles County, childhood asthma accounted for nearly 5,000 hospitalizations in 2002.<sup>2</sup> Although asthma is a potentially serious disease, most asthma symptoms and associated morbidity can be prevented or controlled with appropriate medical treatment and environmental measures, such as avoidance of tobacco smoke and allergens. However, results of the 2002-2003 Los Angeles County Health Survey indicate that many children with asthma in the county have poorly-controlled symptoms

that limit their physical activity and frequently require emergency room and other urgent care services.

Key findings of the survey:

- Overall, an estimated 8% of children (<18 years old), or an estimated 217,000 children, in the county had asthma in 2002-2003 (Table 1), similar to the rate in 1999-2000.<sup>3</sup>
- Among children with asthma, nearly half (45%) had to limit their physical activities at least some of the time because of their asthma. More than one-quarter (28%) had to go to an ER or other urgent care facility for their asthma in the past year; 17% of children with asthma required multiple visits (Figure 1).

**FIGURE 1** Percent (and Estimated Number) of Children with Asthma with ER Visit(s) in the Past Year, 2002-03



## Disparities in Asthma Prevalence and Activity Limitation

Asthma prevalence was approximately two times higher among African-American children (16%) than White (9%), Asian/Pacific Islander (9%) and Latino (6%) children (Table 1). The markedly higher asthma rate among African-American children was also found in the 1999-2000 survey. Asthma was more prevalent among boys (10%) than girls (6%), and increased with age, from 6% among those <5 years old to 10% among those 12-17 years of age. The prevalence was higher among children living in households with incomes above

1. Centers for Disease Control and Prevention, National Center for Environmental Health, 2004.  
2. Office of Statewide Health Planning and Development, Hospital Discharge with Asthma as Principal Diagnosis, Los Angeles County, 2002.

3. Asthma prevalence is based on ever having been diagnosed with asthma by a healthcare provider and having had an asthma attack in the past 12 months or having asthma still. This definition, consistent with national and state standards, was revised for the 2002-03 survey. An analysis of 1999 and 2002 asthma rates using the 1999 definition revealed no change in asthma prevalence between the two survey time periods.

200% federal poverty level (FPL) than among children in lower income households. This finding may be due to differential access to healthcare because the results are based on parent reports of physician-diagnosed asthma.

Among children with asthma, the percentage that had to limit their physical activity was higher among Latino, Asian/Pacific Islander and African-American children than White children (Table 2). The prevalence of activity limitation was higher among those living in poverty (58%) and near poverty (53%) than among

those living above 200% of the federal poverty level (31%) (Figure 2).

## Control of Asthma

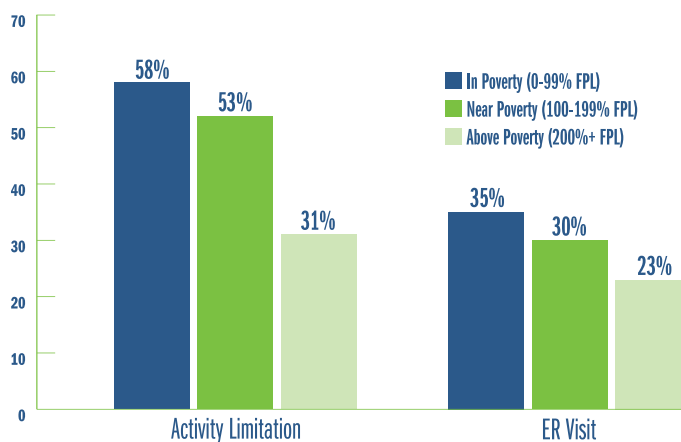
Effective management of asthma improves health outcomes, for example, minimizing activity limitation, and reduces the use of high-cost health care services. Asthma hospitalizations are considered “ambulatory care sensitive”, meaning that with timely and appropriate outpatient services they might be avoided.<sup>4</sup> However, quality of health care, rather than simple access or receipt of care, is the critical link to improving asthma management. Reliance on episodic (e.g., urgent or emergency) care only when a child’s symptoms worsen does not foster ongoing, preventative management of the disease.

**TABLE 1** Prevalence of Asthma Among Children (Age 0 to 17 Years), 2002-03

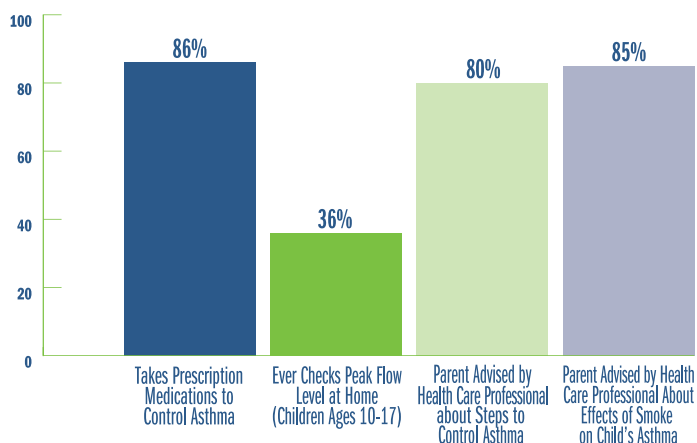
	Percent	95% Confidence Interval	Estimated Number
<b>Los Angeles County</b>	7.9	7.1 - 8.8	217,000
<b>Gender</b>			
Male	9.9	8.6 - 11.2	139,000
Female	5.8	4.8 - 6.9	78,000
<b>Age Group</b>			
0 to 5 Years	5.9	4.5 - 7.2	50,000
6 to 11 Years	7.7	6.4 - 9.1	77,000
12 to 17 Years	10.1	8.4 - 11.8	90,000
<b>Race/Ethnicity</b>			
Latino	6.0	5.1 - 7.0	99,000
White	8.9	6.9 - 10.8	49,000
African-American	16.1	11.9 - 20.3	45,000
Asian/Pacific Islander	8.7	6.0 - 11.4	24,000
<b>&gt;Federal Poverty Level (FPL)</b>			
0-99% FPL	7.1	5.5 - 8.6	66,000
100-199% FPL	7.0	5.4 - 8.6	58,000
200-299% FPL	8.8	6.7 - 11.0	35,000
300% or above FPL	9.9	8.2 - 11.6	58,000
<b>Service Planning Area</b>			
Antelope Valley	12.3	7.8 - 16.8	13,000
San Fernando	8.4	6.5 - 10.3	45,000
San Gabriel	7.5	5.6 - 9.4	37,000
Metro	5.3	3.2 - 7.3	15,000
West	13.0	8.2 - 17.8	14,000
South	5.9	3.6 - 8.1	20,000
East	6.9	4.9 - 8.9	29,000
South Bay	9.8	7.1 - 12.5	43,000

> Based on 2002 Federal Poverty Level (FPL) thresholds which for a family of four (2 adults, 2 dependents) correspond to annual incomes of \$18,859 (100% FPL), \$37,718 (200% FPL) and \$56,557 (300% FPL).

**FIGURE 2** Activity Limitation and Emergency Room Visits Among Children with Asthma (Age 0 to 17 Years), 2002-03



**FIGURE 3** Asthma Management Practices Among Children with Asthma (Age 0 to 17 Years), 2002-03



In Los Angeles County, despite the fact that 94% of children with asthma had health insurance coverage and 97% had a regular provider, many required emergency health care services. Twenty-eight percent of children with asthma in the county needed emergency or urgent medical care in the past 12 months and more than half of these children visited the ER multiple times due to asthma. The percentage that had to go to an emergency room or urgent care clinic for their asthma in the past year was also higher among children living in poverty (35%) and near poverty (30%) than among those living above 200% of the federal poverty level (23%) (Figure 2).

Additional data reported by parents in the survey reveal important opportunities for improving practices that lead to more effective medical- and home-

management of asthma among children. For example, only 36% of children with asthma had their peak flow level (a recommended monitoring test of lung function) checked at home (Figure 3). More than 86% of children with asthma took prescription medication to control asthma. Approximately 80% of parents reported that a health care professional had talked to them about environmental measures they could take in the home to help control their child's asthma. Also, 85% of parents reported that a health care professional had advised them about the importance of keeping their child away from tobacco smoke to help control their asthma; however, 10% of children with asthma were exposed to tobacco smoke in the home on a regular basis.

**TABLE 2 Activity Limitation and ER Visits Among Children with Asthma (Age 0 to 17 Years), 2002-03**

	ACTIVITY LIMITATION			EMERGENCY ROOM OR URGENT CARE VISIT		
	Percent	95% Confidence Interval	Estimated Number	Percent	95% Confidence Interval	Estimated Number
<b>Los Angeles County</b>	45.3	39.6 - 50.9	98,000	28.2	23.0 - 33.5	60,000
<b>Gender</b>						
Male	47.6	40.6 - 54.7	66,000	26.0	19.5 - 32.4	36,000
Female	41.1	31.7 - 50.5	32,000	32.4	23.6 - 41.3	24,000
<b>Age Group</b>						
0 to 5 Years	40.9	29.3 - 52.4	21,000	39.1	27.9 - 50.4	19,000
6 to 11 Years	50.7	41.5 - 59.9	39,000	26.0	18.0 - 34.0	20,000
12 to 17 Years	43.1	34.3 - 51.9	39,000	24.4	15.8 - 33.0	22,000
<b>Race/Ethnicity</b>						
Latino	56.0	48.1 - 63.9	55,000	31.9	24.2 - 39.5	31,000
White	22.6	12.0 - 33.2	11,000	17.7*	8.9 - 26.5	9,000
African-American	38.9	25.0 - 52.9	17,000	33.3	19.5 - 47.1	14,000
Asian/Pacific Islander	59.6	44.2 - 75.0	14,000	26.7*	11.4 - 42.0	6,000
<b>Parent Education Level</b>						
Less than high school	63.0	51.7 - 74.2	33,000	33.8	22.2 - 45.4	17,000
High school	41.8	28.3 - 55.3	20,000	33.7	20.3 - 47.1	16,000
Some college or trade school	41.0	31.4 - 50.5	30,000	21.0	13.6 - 28.3	15,000
College or post graduate degree	33.4	23.6 - 43.3	14,000	26.5	17.2 - 35.8	11,000

\* Estimate should be viewed with caution because of small numbers.

## Discussion

The prevalence of childhood asthma in Los Angeles County has remained relatively stable since 1999-2000 and is comparable to the rate reported nationally.<sup>5</sup> However, the prevalence among African-American children in the county remains substantially higher than among those in other racial/ethnic groups. This disparity has also been reported nationally and in many other jurisdictions although the magnitude of the disparity appears greater in Los Angeles County. Despite considerable research across the country, the factors responsible for the racial disparity in asthma prevalence remain poorly defined.

Although most children in the county with diagnosed asthma have health insurance coverage and a regular source of health care, the survey results suggest that many children are not getting the care needed to adequately control their symptoms. This finding is consistent with other studies that indicate that access to regular health care is necessary but not sufficient to ensure optimal management of childhood asthma.<sup>6,7</sup> A critical component of asthma management is educating parents and children on how to avoid asthma triggers in the environment, recognize asthma symptoms early, and use medications appropriately to prevent asthma exacerbations. This requires timely, ongoing, culturally sensitive and linguistically appropriate communication with a well-trained health care provider.

The survey found that only one-third of school-aged children with asthma had ever measured their peak flow level at home. National guidelines recommend regular monitoring of peak flow in the home to assess lung function and determine the adequacy of treatment and, when appropriate, the need for adjustment of treatments. In addition, while most parents reported that their child used prescription medications, studies have shown that these medications are often not used correctly.<sup>8</sup> For example, the effective use of inhalers often requires instruction by a health care provider or pharmacist and should be monitored to ensure correct technique and appropriate use.

The survey found lower asthma prevalence among low income and Latino children in the county. Given the well-documented barriers to health care in these populations, the findings suggest that a disproportionate percentage of these low income and Latino children may

have undiagnosed asthma. Studies have shown that in urban settings as many as 50% of children with asthma remain undiagnosed.<sup>9</sup> Children with asthma who are undiagnosed or who are not being adequately treated are at increased risk for a variety of complications. These include pneumonia, impaired growth and development, disrupted sleep, and important adverse social impacts, including increased school absenteeism due to illness and inability to be physically active in play and other recreational activities.

## What Can Be Done?

Efforts are needed at multiple levels to decrease the burden of asthma among children in Los Angeles County. Continued efforts are needed in the county to increase access to health care and improve continuity of care to ensure that children with asthma are diagnosed in a timely manner. These efforts are particularly important for African-American children, among whom the burden of asthma is so great, and for low income and Latino populations that have high rates of uninsured and reduced access to services. An important model for identifying hard to reach children with asthma is the Department of Health Services' Breathmobile® Program.<sup>10</sup> The program was designed with assistance from the Southern California Chapter of the Asthma and Allergy Foundation of America. The program uses a mobile van that travels to inner-city schools to identify children either with undiagnosed asthma or previously diagnosed asthma that is not being adequately treated. A validated survey instrument is used to identify children for further clinical evaluation and, if the asthma diagnosis is confirmed, treatment is provided and referral made for ongoing services.

Childhood asthma outcomes are greatly improved when the affected child and family are knowledgeable about the condition and take an active role in its management. Education is needed in both health care and community settings to promote asthma self-management practices and to create more supportive environments as, for example, in schools where staff are not often well equipped to meet the needs of children with asthma. In 2001, the Los Angeles Unified School District (LAUSD) Board of Education adopted a resolution recognizing the value of the American Lung

5. Center for Disease Control, National Center for Health Statistics, *Asthma Prevalence, Health Care Use and Mortality, 2002-2003*.

6. Mansour M.E., Lanphear B.P., and Dewitt T.G., *Barriers to Asthma Care in Urban Children: Parent Perspectives*, *Pediatrics* 106(3), September 2000.

7. Lara M., Duan N., Sherbourne C., Halfon N., Liebowitz A., and Brook R.H., *Children's Use of Emergency Department for Asthma: Persistent Barriers or Acute Need*, *Journal of Asthma* 40(3), 2003.

8. Lozano P., Finkelstein J.A., Hecht J., Shulruff R., and Weiss K.B., *Asthma Medication Use and Disease Burden in Children in a Primary Care Population*. *Archives of Pediatrics & Adolescent Medicine* 157(1):81-88, 2003.

9. Joseph C.L.M., et al., *Prevalence of Possible Undiagnosed Asthma and Associated Morbidity among Urban Schoolchildren*. *Journal of Pediatrics* 129:735-742, 1996.

10. Jones C.A., et al. *A School-Based Case Identification Process for Identifying Inner City Children with Asthma: The Breathmobile Program*. *Chest* 125:924-934, 2004.



Association's Open Airways for Schools program and Environmental Protection Agency's (EPA) Tools for Schools program, and recommended the further implementation of these programs in Los Angeles schools.

The National Heart, Lung and Blood Institute's (NHLBI) Asthma Management Guidelines, considered the gold standard in asthma care, promotes high quality asthma care by providing healthcare providers with guidelines on the best strategies for delivering care to persons with asthma. Although most healthcare providers are aware of these guidelines, recommendations are not consistently followed. Continuous quality improvement interventions that emphasize best practices in the delivery of asthma care can minimize the gap between the knowledge and practice of asthma management.

Strategies to reduce the burden of asthma in the county's child population must also address conditions in the physical and social environments. For example, ongoing successful efforts to reduce levels of tobacco use in the county will have the important side benefit of reducing the severity of asthma among the many children who are currently exposed to tobacco smoke. Policies and other interventions that promote affordable housing and improve housing quality will help to reduce many of the conditions that trigger asthma attacks in children, including exposure to dust, molds, and insect fragments.

A number of studies, some conducted in Los Angeles,<sup>11,12</sup> have documented the important role of outdoor air pollution in worsening asthma symptoms. Although the past three decades have brought substantial improvements in the overall air quality in Southern California, in the past 5-6 years those improvements have leveled off. It is critical to emphasize the importance of environmental, energy and transportation policies that reduce motor vehicle and industrial emissions. Cleaner air will have a beneficial impact on child asthma as well as other respiratory conditions among children in the county.

## on the web



The **Los Angeles Asthma Collaborative** is a partnership of governmental agencies, public health groups and grass root organizations designed to alleviate childhood asthma by addressing environmental factors in the home that trigger the disease, and advocate for policies that encourage reduction of in-door and outdoor triggers.

[www.calasthma.org](http://www.calasthma.org)

The **Breathmobile**<sup>®</sup> is a comprehensive preventive asthma care program in Los Angeles County targeting high-risk inner city children at their schools. A fully equipped mobile clinic, staffed by asthma care specialists based at LAC+USC Medical Center, visits the schools on a regular basis. Children receive a comprehensive evaluation and treatment plan, and are monitored by school nurses.

[www.usc.edu/dept/CCR/leaders/mac.html](http://www.usc.edu/dept/CCR/leaders/mac.html)

The **American Lung Association of Los Angeles County (ALALAC) Open Airways for Schools** is a school-based asthma management program in Los Angeles County that involves children grades 3-5, their parents, teachers, school nurses and classmates. Children learn to solve problems related to asthma and increase their asthma management skills through group discussion and activities.

<http://www.lalung.org/yourlungs/ourprograms.htm>

The **California Community Asthma Intervention** promotes asthma management and education to families of children with asthma under 5 years of age. Trained community asthma coordinators work closely with families to help them get their child's asthma under control, provide education on appropriate administration of asthma medications, and the identification of asthma triggers.

[www.dhs.ca.gov/ps/cdic/cdcb/medicine/asthma/Documents/CAIBrochure.pdf](http://www.dhs.ca.gov/ps/cdic/cdcb/medicine/asthma/Documents/CAIBrochure.pdf)

The **California Asthma Public Health Initiative (CAPHI)** aims to improve the quality of life for all children and adults with asthma through implementation of effective programs and policies in asthma education, management, and prevention.

[www.dhs.ca.gov/ps/cdic/cdcb/Medicine/Asthma/](http://www.dhs.ca.gov/ps/cdic/cdcb/Medicine/Asthma/)

The **Environmental Protection Agency's Indoor Air Quality Tool for Schools** shows schools how to carry out a plan of action to improve indoor air problems at minimal or no cost using practical approaches and in-house staff.

<http://www.epa.gov/iaq/schools/toolkit.html>

The **Centers for Disease Control and Prevention** provides general information and national estimates on asthma in the United States.

[www.cdc.gov/asthma/faqs.htm](http://www.cdc.gov/asthma/faqs.htm)

11. Ostro B., et al. Air Pollution and Exacerbation of Asthma in African-American Children in Los Angeles. *Epidemiology* 12:200-208, 2001

12. McConnell R., et al. Air pollution and Bronchitic Symptoms in Southern California Children with Asthma. *Environmental Health Perspective* 107:757-760, 1999.