UCLA Health Policy Research Brief

February 2007

Low-Income Californians Bear Unequal Burden of Asthma

Susan H. Babey, Theresa A. Hastert, Ying-Ying Meng and E. Richard Brown

In California, 2.8 million children and adults (900,000 children and 1.9 million adults) suffer from active asthma. One out of six of these Californians (16%) lives below the poverty level.[1] Low-income adults and children with active asthma disproportionately bear the burden of asthma. They experience more frequent symptoms, go to the emergency department (ED) more often for asthma care, miss more school and have poorer health status. They also are more likely to lack access to health care and to live in conditions associated with asthma exacerbations.

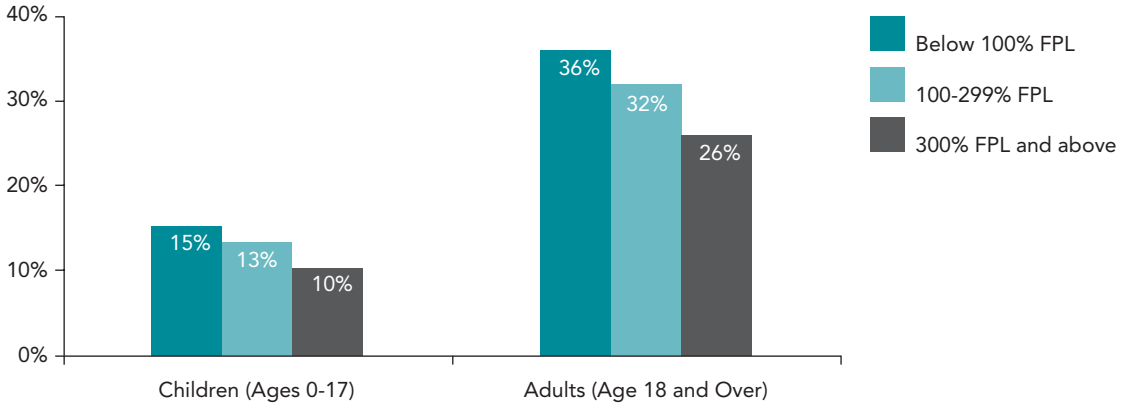
Using data from the 2003 California Health Interview Survey (CHIS 2003), this policy brief examines the burden of asthma among low-income asthma sufferers as well as some opportunities to reduce the burden for these asthma sufferers. Active asthma refers to people who have been diagnosed with asthma and who reported they still have asthma and/or experienced an asthma attack in the past year.

Low-Income Families Disproportionately Affected by Frequent Asthma Symptoms, Emergency Department Visits and Poor Health Status

Low-income families in California disproportionately experience negative consequences of asthma, such as frequent asthma symptoms, ED visits for asthma, school absenteeism and poor health status.

Exhibit 1

Prevalence of Daily or Weekly Asthma Symptoms by Income Among Those with Active Asthma, California, 2003



Note: In 2003 the Federal Poverty Level was $12,384 for a family of two and $18,810 for a family of four; *http://www.census.gov/hhes/poverty/threshld/thresh03.html* (accessed May 25, 2006).

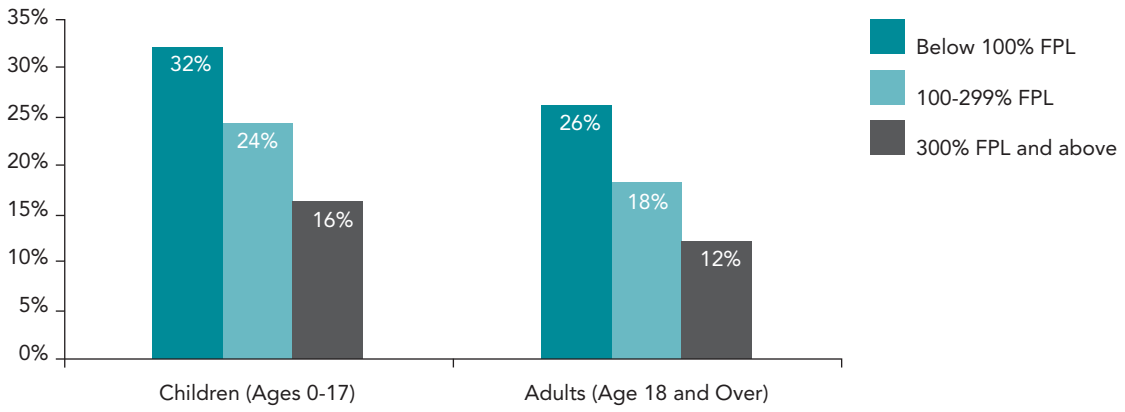
Source: 2003 California Health Interview Survey

The California Endowment

Support for this policy brief was provided by a grant from The California Endowment.

Exhibit 2

Emergency Department Visits for Asthma by Income Among Those with Active Asthma, California, 2003



Note: In 2003 the Federal Poverty Level was $12,384 for a family of two and $18,810 for a family of four; *http://www.census.gov/hhes/poverty/threshld/thresh03.html* (accessed May 25, 2006).

Source: 2003 California Health Interview Survey

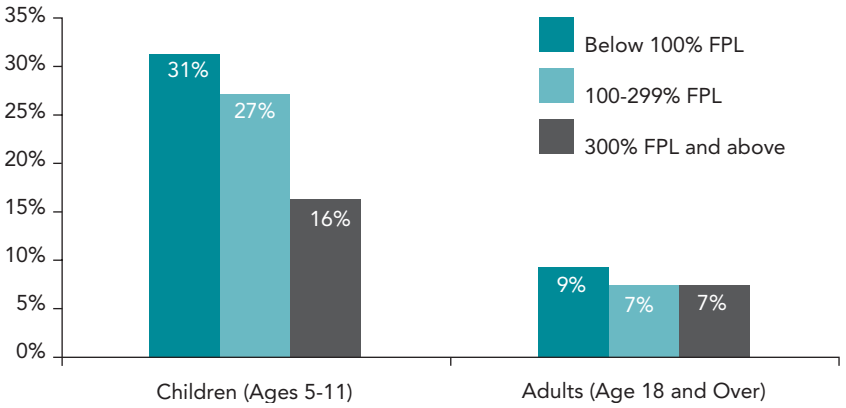
In California, 660,000 children and adults with active asthma experienced symptoms at least once a week (24%). A higher proportion of adults living below the federal poverty line experience frequent asthma symptoms compared to more affluent adults. Among adults with active asthma, 36% of those with household incomes below the federal poverty level (FPL) experienced asthma symptoms every day or every week compared with 26% of those with household incomes at or above 300% FPL (Exhibit 1). Among children, 15% of those living in poverty experienced symptoms at least once a week compared to 10% of more affluent children. However, this difference is not statistically significant.

Utilization of the ED for asthma care is costly and in most cases avoidable. In addition, seeking asthma treatment in an ED could be an indicator of inadequate asthma management. In California, 500,000 adults and children went to the ED for asthma at least once in the past year (18%).

The rate of ED visits for asthma is twice as high among children and adults living below the poverty line as among more affluent families. Among those with active asthma, 32% of children living in poverty had at least one ED visit for their asthma in the past year compared to just 16% of those at or above 300% FPL (Exhibit 2). A similar pattern is found among adults. Twenty-six percent of adults with incomes below 100% FPL went to the ED for asthma compared to 12% of those with incomes at or above 300% FPL. This is consistent with previous research showing that a greater proportion of patients reporting to emergency departments are from low-income households compared to those reporting to an ambulatory asthma clinic.[2]

Asthma is one of the leading causes of missed school days among children and accounts for millions of lost workdays annually among adults.[3] In California, 88,000 children ages 5-11 missed at least one week of school (23%) and 81,000 adults missed at least one week of work (7%) because of their asthma. Among children ages 5-11 with active asthma, children in households below the poverty line were more likely to miss at least one week of school (31%) than those with incomes at or above 300% FPL (16%; Exhibit 3). More adults from households with incomes below the poverty line missed at least one week of work (9%) compared with adults from higher-income households (7%); however, this difference is not significant.

Percent of Children Who Missed at Least One Week of School and Percent of Employed Adults Who Missed at Least One Week of Work Due to Asthma by Income Among Those with Active Asthma, California, 2003 **Exhibit 3**

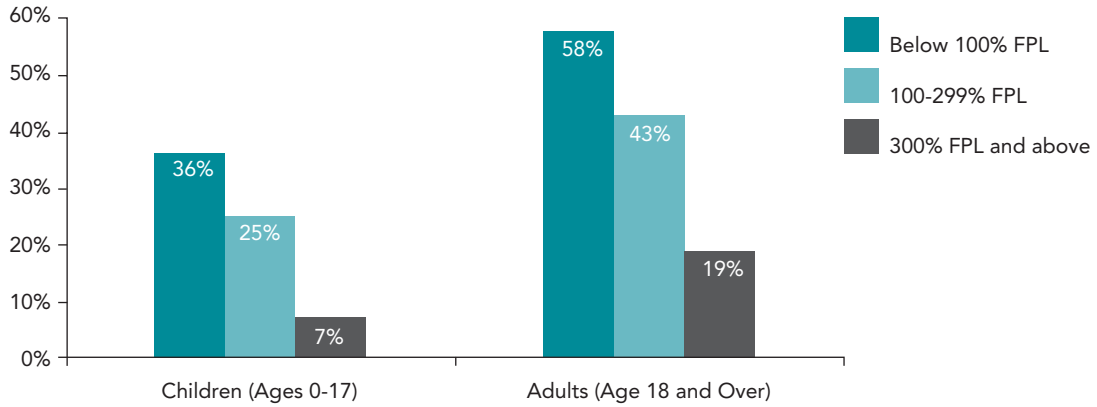


Note: This analysis excluded adults not currently working. In 2003 the Federal Poverty Level was $12,384 for a family of two and $18,810 for a family of four; *http://www.census.gov/hhes/poverty/threshld/thresh03.html* (accessed May 25, 2006).

Source: 2003 California Health Interview Survey

Asthma can negatively impact the overall health of those living with the condition. In California, 780,000 adults and children with active asthma report fair or poor health status (28%). The percent of children and adults reporting fair or poor health status is much higher among those living in poverty than among those living in higher-income households. Among children with active asthma, those with family incomes below poverty are five times more likely to be in fair or poor health than those at or above 300% FPL (36% vs. 7%; Exhibit 4). Among adults with active asthma, those with incomes below 100% FPL are three times more likely to report being in fair or poor health than those with incomes at or above 300% FPL (58% vs. 19%).

Percent Reporting Fair or Poor Health Status by Income Among Those with Active Asthma, California, 2003 **Exhibit 4**



Note: In 2003 the Federal Poverty Level was $12,384 for a family of two and $18,810 for a family of four; *http://www.census.gov/hhes/poverty/threshld/thresh03.html* (accessed May 25, 2006).

Source: 2003 California Health Interview Survey

Poor Access to Care and Inadequate Asthma Management Contribute to Disparities

Asthma is a complex condition and a number of factors are likely to contribute to the asthma burden experienced by California's low-income families. Among Californians with active asthma, those from low-income families are more likely to lack continuous health coverage, have no usual source of health care, and never have received an asthma management plan from their doctor or other health care provider.

Lack of health insurance has been associated with worse health outcomes in both children and adults with asthma.[4] In California, 370,000 persons with active asthma (13%) lacked insurance coverage for all or part of the year, a problem that is much more likely to affect low-income families than more affluent families. Among adults and children with active asthma, approximately one out of five adults and children living in lower-income households were uninsured for all or part of the year (18% and 19% respectively for below 100% FPL and 100-299% FPL) compared with one out of twelve adults and children with household incomes at or above 300% FPL (8%; Exhibit 5).

Continuity of care has been associated with better outcomes, including fewer emergency department visits and fewer hospitalizations among asthma patients.[5] However, more than 290,000 California children and adults with active asthma (11%) have no usual source of health care, a barrier to receiving the continuity of care that is essential to controlling their disease. Lack of a usual source of health care is more prevalent among low-income families than more affluent ones. Among adults and children with active asthma, 14-16% of those living in lower-income households had no usual source of health care compared with just 7% of those with household incomes at or above 300% FPL (Exhibit 5).

Individualized, written asthma management plans are important in helping people with asthma to reduce exposure to environmental triggers that increase the frequency and severity of their symptoms, and to use medication effectively to control the disease.[6] Despite the evidence of their importance, 1.7 million children and adults with active asthma (61%) have never received an asthma management plan (Exhibit 5). Californians with active asthma who live in poverty are less likely to have received an asthma management plan than more affluent Californians. Among adults and children with active asthma, 65% of those from lower-income households never received an asthma management plan. But even among

Exhibit 5

Health Care Access Indicators by Income Among Those with Active Asthma, All Ages, California, 2003

	Uninsured All or Part Year	No Usual Source of Health Care	Never Received Asthma Management Plan
Income as Percent of Federal Poverly Level (FPL)	**%**	**%**	**%**
0-99% FPL	18%	16%	65%
100%-299% FPL	19%	14%	64%
300% FPL and above	8%	7%	59%
Californians with Active Asthma	**13%**	**11%**	**61%**

Note: Age groups were combined to produce more reliable estimates. In 2003 the Federal Poverty Level was $12,384 for a family of two and $18,810 for a family of four; *http://www.census.gov/hhes/poverty/threshld/thresh03.html* (accessed May 25, 2006).

Source: 2003 California Health Interview Survey

Percent Reporting Smoking and Cockroaches in the Home by Income Among Those with Active Asthma, All Ages, California, 2003

Exhibit 6

	Smoking in Home	Cochroaches in Home
Income as Percent of Federal Poverly Level (FPL)	**%**	**%**
0-99% FPL	16%	28%
100%-299% FPL	12%	16%
300% FPL and above	7%	8%
Californians with Active Asthma	**10%**	**14%**

Note: Age groups were combined to produce more reliable estimates. In 2003 the Federal Poverty Level was $12,384 for a family of two and $18,810 for a family of four; *http://www.census.gov/hhes/poverty/threshld/thresh03.html* (accessed May 25, 2006).

Source: 2003 California Health Interview Survey

those in households with incomes at or above 300% FPL, 59% report never having received an asthma plan from their provider—a serious breakdown in the quality of asthma care.

Household Living Conditions Contribute to Disparities

Household risk factors, such as the presence of tobacco smoke and cockroaches, can exacerbate asthma symptoms. Low-income Californians are more likely to be exposed to these household risk factors.

Exposure to second-hand smoke has been associated with wheeze illnesses and breathlessness among school-age children, with adult-onset of asthma, and with worsening asthma control in adults.[7] In California, 280,000 children and adults with active asthma are exposed to second-hand smoke at home (10%). Low-income Californians with active asthma are more likely to live in smoking households (Exhibit 6). Among adults and children with active asthma, the percentage of those living below the poverty line that are exposed to second-hand smoke (16%) is more than twice as high than for those with incomes at or above 300% FPL (7%).

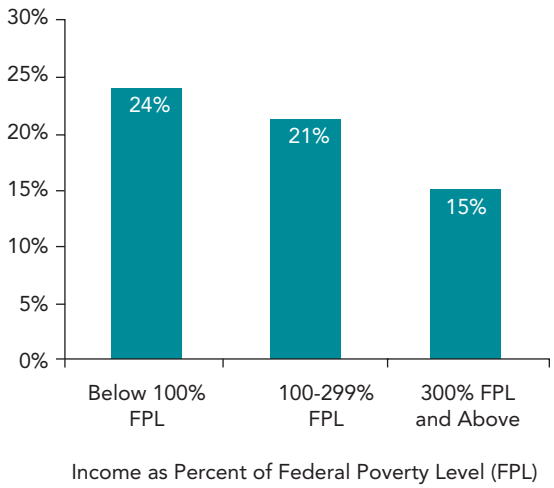
Sensitization and exposure to cockroach allergens is associated with increased asthma morbidity in the United States, especially among minority groups such as Latinos and African Americans, and among low-income persons.[8] In California, 380,000 children and adults with active asthma report seeing cockroaches in their homes (14%). Low-income Californians with active asthma are more likely to have seen cockroaches in their homes in the previous year (Exhibit 6). Among adults and children with active asthma, the percentage of those living below the poverty line that have seen cockroaches in their home (28%) is more than three times as high as for those with incomes at or above 300% FPL (8%). In substandard housing, cockroaches are often present regardless of cleaning practices, suggesting a need for improvement in housing conditions rather than changes in the behavior of individuals.[9]

Health Behaviors Contribute to Disparities

Tobacco smoke is a common trigger for asthma, and people with asthma are strongly encouraged to avoid smoking.[10] However, 340,000 California adults with active asthma (18%) smoke, and low-income adults are

Exhibit 7

Prevalence of Current Smoking by Income Among Those with Active Asthma, Adults Age 18 and Over, California, 2003



Note: In 2003 the Federal Poverty Level was $12,384 for a family of two and $18,810 for a family of four; *http://www.census.gov/hhes/poverty/threshld/thresh03.html* (accessed May 25, 2006).

Source: 2003 California Health Interview Survey

more likely to smoke than those from more affluent households. Among adults with active asthma, 24% of those living below the poverty line are current smokers compared to 15% of those with incomes at or above 300% FPL (Exhibit 7).

Discussion and Policy Recommendations

Among adults and children with active asthma, those living in low-income families disproportionately bear the burden of asthma. They are more likely to experience frequent symptoms, go to the emergency department for asthma care, miss school and have poorer health status. They are also more likely to lack access to health care and to live in conditions such as smoking households that are associated with asthma exacerbations.

The disproportionate asthma burden experienced by low-income Californians is likely due to a number of factors, including inadequate health insurance coverage and inadequate access to consistent care. Asthma symptoms and negative asthma outcomes are often preventable with appropriate care and management. The prevention and control of asthma symptoms, and reducing the disproportionate asthma burden suffered by low-income Californians, require clinical, policy and public health efforts. These efforts should include improving access to appropriate health care, improving asthma management efforts, and reducing exposure to asthma triggers.

- **Improve access to health care** – Improved access to health care, including continuous health insurance coverage and having a usual source of health care, is associated with better health outcomes for those with active asthma. However, compared with more affluent respondents, more than twice as many low-income adults and children lack continuous health coverage and a usual source of care. Improving access to continuous health coverage and to appropriate and consistent health care—particularly for those in lower-income households—is important to improve asthma management, and to decrease reliance on costly emergency department visits and hospitalizations in order to treat asthma.

- **Improve asthma management efforts** – Low-income adults and children with asthma are less likely to receive asthma management plans than their more affluent counterparts. Asthma management plans are effective in helping people with asthma control their disease. Statewide, 61% of Californians with asthma have never received an asthma management plan. In addition, adults and children from low-income households are less likely to receive asthma management plans than those from more-affluent homes. Providing asthma management plans to low-income patients could improve asthma control and reduce the risk of requiring more intensive treatment in the future.

- **Raise awareness of and reduce exposure to asthma triggers –** Household environmental factors, such as exposure to tobacco smoke and the presence of cockroaches in the home, exacerbate asthma symptoms. Californians in low-income households are more likely to live in homes where these triggers are present. Physicians and health educators should work to raise awareness of these triggers and ways to minimize exposure, particularly for low-income patients. In addition, smoking cessation efforts should be expanded—with a particular focus on adult smokers suffering from current asthma or living with someone with asthma, especially those from low-income households—because tobacco smoke is more likely to be present in those homes than in more affluent ones. Smoking and exposure to second-hand smoke are associated with increased asthma symptom prevalence and worsened asthma control. Also, these indoor asthma triggers may add to the effects of air pollution in some parts of the state. Some triggers, such as smoking, can be reduced through behavior change, whereas others require policy changes. For example, we can reduce exposure to second-hand smoke by creating policies that ban smoking in multi-unit housing or we can reduce cockroaches by improving building inspection and remediation practices.

Controlling asthma is an important goal for health policy and health care professionals because of the burden that it places on those who suffer from the condition and their families, as well as on the medical care system.

Data Source

All statements in this report that compare rates for one group with another reflect statistically significant differences ($p<0.05$) unless otherwise noted. The findings in this brief are based on data from the 2003 California Health Interview Survey (CHIS 2003). CHIS 2003 completed interviews with over 42,000 households, including adults, adolescents and children drawn from every county in the state. Interviews were conducted in English, Spanish, Chinese (both Mandarin and Cantonese), Vietnamese and Korean.

The findings included in this policy brief are subject to some limitations. These findings are based on self-reported, cross-sectional data. It is possible that respondents' self-reports were influenced by a recall bias. As a cross-sectional survey, caution should be taken in drawing conclusions about causal relationships based on statistical relationships found in this study.

CHIS is a collaboration of the UCLA Center for Health Policy Research, the California Department of Health Services, and the Public Health Institute. Funding for CHIS 2003 was provided by the California Department of Health Services, The California Endowment, the National Cancer Institute, the Centers for Disease Control and Prevention (CDC), the Robert Wood Johnson Foundation, the California Office of the Patient Advocate, Kaiser Permanente, L.A. Care Health Plan and the Alameda County Health Care Agency. For more information on CHIS, visit *www.chis.ucla.edu.*

Author Information

Susan H. Babey, PhD, is a research scientist at the UCLA Center for Health Policy Research. Theresa A. Hastert, MPP, is a senior research associate at the UCLA Center for Health Policy Research. Ying-Ying Meng, DrPH, is a senior research scientist at the UCLA Center for Health Policy Research. E. Richard Brown, PhD, is the director of the UCLA Center for Health Policy Research and a professor in the UCLA School of Public Health.

Acknowledgements

The authors wish to thank Winnie Huang, MS, Sungching Glenn, MS, Jason Monroe, Jenny Chia, PhD, Hongian Yu, PhD, Garrison Frost, Celeste Maglan and Sheri Penney for their assistance. The authors would also like to thank the following individuals for their helpful comments: Anne Kelsey Lamb, MPH, Director, Regional Asthma Management and Prevention Initiative; and Allison L. Diamant, MD, MSHS, associate professor in the Division of General Internal Medicine and Health Services Research at the David Geffen School of Medicine at UCLA.

Suggested Citation

Babey SH, Hastert TA, Meng YY and Brown ER. *Low-Income Californians Bear Unequal Burden of Asthma*. Los Angeles: UCLA Center for Health Policy Research, 2007.

UCLA CENTER FOR HEALTH POLICY RESEARCH

The UCLA Center
for Health Policy Research
is affiliated with the
UCLA School of Public Health
and the UCLA School of Public Affairs.

PB2007-1

Editor-in-Chief: E. Richard Brown, PhD

Phone: 310-794-0909
Fax: 310-794-2686
Email: chpr@ucla.edu
Web Site: www.healthpolicy.ucla.edu

Notes

1 In 2003 the Federal Poverty Level was $12,384 for a family of two and $18,810 for a family of four; *http://www.census.gov/hhes/poverty/threshld/thresh03.html* (accessed May 25, 2006).

2 Hanania NA, David-Wang A, Kesten S, Chapman KR. Factors associated with emergency department dependence of patients with asthma. *Chest*. Feb 1997;111(2):290-295.

3 American Academy of Allergy, Asthma and Immunology, Allergy and Advocate: Fall 2004. Available at: *www.aaaai.org/patients/advocate/2004/fall/costs.stm*. Mannino DM, Homa DM, Akinbami LJ, Moorman JE, Gwynn C, Redd S. Surveillance for Asthma—United States, 1980–1999. Morbidity and Mortality Weekly Report Surveillance Summary. March 29, 2002; 51(No.SS-1):1–13.

4 Ferris TG, Crain EF, Oken E, Wang L, Clark S, Camargo Jr CA. Insurance and quality of care for children with acute asthma. *Ambulatory Pediatrics*. Sep-Oct 2001;1(5):267-274. Markovitz BP, Andresen EM. Lack of insurance coverage and urgent care use for asthma: a retrospective cohort study. *BMC Public Health*. 2006;6:14.

5 Cree M, Bell NR, Johnson D, Carriere KC. Increased continuity of care associated with decreased hospital care and emergency department visits for patients with asthma. *Disease Management.* Feb 2006;9(1):63-71.

6 Agrawal SK, Singh M, Mathew JL, Malhi P. Efficacy of an individualized written home-management plan in the control of moderate persistent asthma: a randomized, controlled trial. *Acta Paediatrica.* Dec 2005;94(12):1742-1746. Holt S, Masoli M, Beasley R. The use of the self-management plan system of care in adult asthma. *Primary Care Respiratory Journal*. Mar 2004;13(1):19-27.

7 Agrawal SK, Singh M, Mathew JL, Malhi P. Efficacy of an individualized written home-management plan in the control of moderate persistent asthma: a randomized, controlled trial. *Acta Paediatrica.* Dec 2005;94(12):1742-1746., Holt S, Masoli M, Beasley R. The use of the self-management plan system of care in adult asthma. *Primary Care Respiratory Journal*. Mar 2004;13(1):19-27. Thorn J, Brisman J, Toren K. Adult-onset asthma is associated with self-reported mold or environmental tobacco smoke exposures in the home. *Allergy*. Apr 2001;56(4):287-292. U.S. Department of Health and Human Services. *The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon General – Executive Summary*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, Coordinating Center for Health Promotion, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2006.

8 Arruda LK, Vailes LD, Ferriani VP, Santos AB, Pomes A, Chapman MD. Cockroach allergens and asthma. *Journal of Allergy and Clinical Immunology*. Mar 2001;107(3):419-428.

9 Rauh VA, Chew GR, Garfinkel RS. 2002. Deteriorated housing contributes to high cockroach allergen levels in inner-city households. *Environmental Health Perspectives*. 110(Suppl. 2):323–27

10 Lemiere C, Boulet LP. Cigarette smoking and asthma: a dangerous mix. *Canadian Respiratory Journal*. Mar 2005; 12(2):79-80.

UCLA Center for Health Policy Research

10960 Wilshire Blvd., Suite 1550
Los Angeles, California 90024