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The Elements for Improving Childhood Asthma Outcomes



THE GEORGE WASHINGTON UNIVERSITY
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THE DEPARTMENT OF HEALTH POLICY

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The Elements for Improving Childhood Asthma Outcomes

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Executive Summary

Executive Summary

Childhood asthma is a serious and chronic health issue that affects one in seven U.S. children and their families, compromising their health and quality of life and placing a heavy financial burden on families as well as an enormous strain on the health care system.

Treating, managing, and ultimately preventing and reducing the burden of asthma represents a critical test of the ability of the U.S. health system – health insurers, clinical care providers, and public health agencies – to work together. Our investigation found that, as a country, we already know enough to act and improve life for the millions of children living with asthma; we're just not aiming high enough. If we did, the nation would create and put into place an array of policy reforms that together could translate into real change.

Research has shown the effectiveness of comprehensive asthma treatment and management: (1) high quality clinical care; (2) case management and educational counseling; and (3) community and home interventions that help families reduce the environmental triggers that can cause or worsen asthma.

For comprehensive asthma treatment and management to reach children in need, several elements are essential, and collaboration and communication are key:

- Stable and continuous health insurance;
- High quality clinical care, case management, and asthma education available for all children, including those who remain ineligible for insurance coverage;
- The ability to continuously exchange information and monitor progress, using as much as possible health information technology (HIT);
- Reduction of asthma triggers in homes and communities; and
- Learning what works and increasing knowledge.

This report lays out the facts and offers specific policy recommendations for success that could change the face of childhood asthma in America. These recommendations aim to make better use of programs and policies already in place, such as Medicaid and the Children's Health Insurance Program (CHIP), as well as private sector insurance coverage and existing public health programs. The recommendations also underscore the importance of careful research – scientific, practical, and community-based – in order to continue to learn what works best and strengthen knowledge for future action.

In a reformed health system, these initial efforts are not wasted tools. Instead, they become the critical platform on which further interventions would rest.

WHAT WE KNOW

Asthma is extraordinarily prevalent. Asthma represents the second most prevalent childhood condition and the single most common chronic condition among children. In 2008, one in every seven children — 10.2 million — had lifetime asthma, and one in 11 children — 6.95 million — had current asthma. Prevalence rates are even higher among the 24 million children at risk for medical underservice as a result of low family income and residence in communities that lack adequate primary health care resources.

Asthma prevalence is growing. The proportion of children with asthma steadily grew over the 1997-2008 time period. Nearly 60 percent of children with diagnosed asthma have experienced an attack within the previous 12 months.

Asthma is nationwide, but certain states and communities experience especially serious burdens. For example, nearly one in five children living in Puerto Rico has asthma. Community-level data are largely lacking, but the existing research suggests that in some communities as many as 40 percent of children are living with asthma. Asthma appears to be equally prevalent in rural and urban areas.

Low income and minority children bear the heaviest burden of asthma and its consequences, including death. One in three children living with asthma is poor, and 60 percent have family incomes below twice the federal poverty level. Health care providers that specialize in treating low income and medically underserved children report particularly high levels of asthma. Community health centers in 2007 reported that 20 percent of their pediatric patients had asthma. Compared to white non-Hispanic children, asthma is 60 percent higher among African-American children and nearly 300 percent higher among Puerto Rican children.

Asthma is extremely costly. Asthma adds nearly 50 cents to every health care dollar spent on children compared to children without asthma. In 2006, the nation spent eight billion dollars alone on treating childhood asthma. Compared with children who do not have asthma, pharmaceutical expenditures are nearly four times higher for asthmatic children, outpatient office-based expenditures are 55 percent higher, and emergency department care is 40 percent higher. Asthma was associated with 13.6 percent of all pediatric hospitalizations in 2006, and children with asthma who use emergency department care are significantly more likely than children without asthma to require inpatient admission (65 percent v 44 percent).

Racial and ethnic disparities in access to effective treatment are widespread. Despite the need and risk, health care expenditures are the lowest for the children most at risk. African-American children and Hispanic children receive about half as much outpatient care and medication management than white children. Yet because they are more likely to be low income and medically underserved, Hispanic children also experience the highest hospital emergency department expenditure rate.

Insurance is key, but we may be missing many children. An estimated nine percent of all children living with asthma remain completely uninsured; we estimate that nearly 600,000 are eligible for Medicaid or CHIP but unenrolled.

It Doesn't Have to Be This Way; We Know Enough to Act

Asthma is a bellwether of health system performance, and progress in reducing and controlling asthma is a sign of health system improvement. Effective management of asthma spans the entire health system and thrives on smooth coordination and effective communication among key actors: health insurers, health care providers, public health agencies, schools, state and local environmental programs, and community programs.

Childhood asthma is a serious and chronic health issue that affects one in seven U.S. children and their families...

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...progress on asthma depends on learning what works in the real-world — in and outside of health care settings

Certain factors that trigger asthma, such as genetic predisposition, history of allergies, or gender, may not be amenable to change. But key risk factors are open to change. These include inadequate access to high quality medical care, inadequate health education for families of children with asthma, and failure to address indoor asthma triggers and outdoor environmental risks.

Over the long term, progress on asthma depends on learning what works in the real-world — in and outside of health care settings — and advancing our scientific understanding of the condition and its effects.

The elements for improving childhood asthma outcomes include the following:

- **Stable and continuous health insurance.** All children — especially those with asthma — must have stable, continuous, and high quality health insurance coverage, the foundation of comprehensive health care. Some 1.17 million children - an estimated nine percent of all children living with asthma - remain completely uninsured. We estimate that nearly 600,000 are *currently* eligible for Medicaid or CHIP but unenrolled. Medicaid and CHIP are essential to the health of low income children; no eligible child with asthma should go without coverage.
- **High quality clinical care, case management, and asthma education available for all children, including those who remain ineligible for insurance coverage.** The health care system must perform well, getting the right care to children and their families at the right time. High quality care is essential for all children, including those who remain ineligible for coverage. For children at risk for medical underservice, access points through community health centers, children's hospitals, public hospitals and health systems, and other sources of community care are essential. High quality care means having a regular source of medical care that offers a medical home to children and their families, access to specialty care, preventive care and prompt treatment for acute episodes, ongoing case management and health education, and linkages to home-based and environmental services. Increasingly, having a medical home also will mean having a provider with the ability to make meaningful use of health information technology and with the ability to exchange essential information with community public health agencies, and school systems, particularly those with on-site asthma management programs. More generally, educators and school health care staff must also be able to manage asthma in school settings.
- **The ability to continuously exchange information and monitor progress, using as much as possible health information technology or HIT.** Providers, insurers, and public health agencies must be able to collaborate on efforts to monitor communities for asthma prevalence, as well as on the progress of children in treatment. Children's health care providers need to be able to exchange information with other providers, such as hospitals that provide emergency or inpatient treatment for acute episodes. All health care providers need to be able to communicate treatment information not only to insurers but to public

health agencies, which must be able to monitor communities both for asthma prevalence and the availability of effective clinical and community preventive services. Implementation of the Medicaid HIT incentive provisions contained in the HITECH Act will be of crucial importance in assuring that pediatric care benefits from HIT, because of the high proportion of U.S. children enrolled in Medicaid and CHIP.

- **Reduction of asthma triggers in homes and the communities.** Asthma is triggered by specific risk factors found in homes and communities. Combining high quality clinical care with health education in the home works to reduce environmental health risks. We just are not doing enough of it. Public health agencies, housing authorities and environmental agencies must promote evidence-based interventions and services that are essential to reducing the many environmental asthma triggers that lie beyond the control of any one family and fall outside of traditional “health care” interventions.
- **Learning what works and increasing knowledge.** Much work has been done to build the knowledge base for what is needed, but what we know needs to be continuously tested and refined in order to make health care as effective as possible. We need further basic research into the science of asthma so that new and more effective treatments can be developed. Despite the involvement in asthma-related research on the part of numerous agencies at the United States Department of Health and Human Services (HHS), there is no strategic plan for asthma research that lays out a strategy moving across the continuum of scientific discovery and translation into routine practice.

How to Achieve the Elements for Improving Asthma Outcomes: Using Available Tools and Aiming Higher

We have numerous tools for improving asthma treatment and management, while reducing the burden of asthma on children and families. But we need to aim higher through innovation in existing programs as well as through active coordination across the major federal agencies whose programs and strategies influence national asthma policy, particularly for the most at-risk children. The policy innovations launched today will lay important groundwork for broader transformations to come through comprehensive health reform.

Today’s federal health programs offer specific policy levers that can be used to enable better performance for children with asthma. Numerous federal agencies play a crucial role in achieving a robust response to the great challenges posed by childhood asthma: HHS; the United States Environmental Protection Agency (EPA); and the United States Department of Education (ED).

We present specific and feasible policy recommendations for each element identified as key to improving asthma outcomes:

Stable and Continuous Health Insurance

- Make continuous Medicaid and CHIP enrollment a part of every eligible child’s asthma treatment plan developed by the child’s health care provider team. Approximately a half million children with asthma are eligible but unenrolled in Medicaid or CHIP — and with millions more currently enrolled in Medicaid or CHIP but at risk for breaks in coverage — Medicaid and CHIP enrollment should be viewed as part of the treatment plan for every eligible child with asthma.

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- Encourage all states to expand Medicaid and CHIP to at least 300 percent of the federal poverty level and to adopt new options to fully cover legally resident children. With expanded eligibility for coverage comes the potential for more stable and higher quality health care. Today seven states cover all children with family incomes up to 300 percent of the federal poverty level. Were all states to increase coverage to 300 percent of the federal poverty level, an additional one million children beyond those currently eligible would be eligible for Medicaid or CHIP. Of this number, an estimated 180,000 would be previously uninsured children with asthma. Expansion of public insurance to reach all eligible children nationally would represent an enormous advance and one consistent with broader health reform.
- Encourage all states to adopt Medicaid and CHIP enrollment and retention reforms, especially reforms aimed at making enrollment and retention activities possible through community health care providers, schools, and other locations where children and families can easily apply for, and renew, coverage. Outreach funding should be made available through Medicaid and CHIP, and community providers should partner with hospitals furnishing acute care to assure that no child is missed.
- Make enhanced asthma treatment and management a specific focus of quality performance improvement in Medicaid and CHIP. The 2009 CHIP legislation increases the focus on quality performance improvement among Medicaid and CHIP providers through the development of national performance measures and alignment of these measures with provider payment incentives. Existing performance measures related to childhood asthma should be strengthened to more closely align with the National Heart Lung and Blood Institute's (NHLBI) National Asthma Education and Prevention Program (NAEPP) clinical treatment guidelines, particularly in the areas of health education and case management. Medical home and accountable care organization demonstrations that utilize these measures to incentivize provider performance should be encouraged.
- Create an HHS-led, cross-agency, Administration-wide national plan for changing childhood asthma outcomes. Despite a wealth of programs and the importance of HHS programs to ensure accessible and quality care for children most at risk for asthma and its consequences, there is no current joint HHS guidance that comprehensively addresses childhood asthma, although HHS did issue a strategic plan on asthma in May 2000. The plan describes the role of the Department in pursuing priority public health actions to eliminate disparities and reduce the overall impact of asthma and to address urgent needs for research in order to better understand the causes of the epidemic and develop preventive interventions to address these causes. The need for such leadership and guidance is particularly acute today in the case of programs overseen by the Centers for Medicare and Medicaid Services (CMS) because of the role of Medicaid and CHIP in financing systemic improvements in pediatrics. The creation of such guidance could be led by a Secretarial-level workgroup consisting of CMS, the Health Resources and Services Administration (HRSA), the Centers for Disease Control and Prevention (CDC), the Indian Health Service (IHS), the Office of the National Coordinator for Health Information Technology (ONCHIT), in collaboration with the Departments of Education (ED) and Housing and Urban Development (HUD) and the EPA.

Through a transparent process that involves consumers, health professionals, payers, and experts in public health practice, health information, health care financing, school health, community health, and clinical treatment for children with asthma, a Secretarial work-group could develop comprehensive guidance. Such guidance could address the plethora of daily practical issues that arise when states and localities attempt to make better and more coordinated use of separate public programs in order to improve quality and efficiencies, reduce disparities in health and health outcomes, reduce public health threats, and improve overall population health. Practical guidance would greatly help translate the promise of public programs into real-world change. Such guidance could address with clarity:

1. The clinical services and treatments that Medicaid and CHIP will pay for and the treatment settings in which payment can be made;

High quality clinical care, case management, and asthma education available for all children, including those who remain ineligible for insurance coverage.

2. Special financing opportunities in the case of community-based programs and health care providers that treat a disproportionate number of children with asthma and that are located in medically underserved rural and urban communities;
3. Options to finance outreach, health education, and case management in community settings;
4. Developing and using public health and practice registries related to childhood asthma and federal resources available for such activities;
5. Resources available for mitigating home and environmental threats;
6. The meaningful use of HIT in the context of pediatrics generally and childhood asthma in particular, because of the extent to which the quality of asthma care can benefit from improved health information exchange;
7. Privacy and security considerations in adapting HIT to childhood asthma, which must cross clinical care, payers, educational systems, environmental practice, and public health practice.

A far-reaching and visionary cross-agency initiative would do much in our view to encourage change at every level, while also attracting broad private sector participation because of the cost of childhood asthma to all payers.

- Make performance improvement in childhood asthma a key program aim for community health centers and the Indian Health Service (IHS). Together, community health centers and the IHS reach millions of the children most at risk for asthma. Performance in pediatric asthma management and treatment should become a basic mechanism for measuring health care performance.

The ability to continuously exchange information and monitor progress, using as much as possible opportunities presented by HIT.

Enhance asthma monitoring through model registries.

Asthma registries are essential to population surveillance, monitoring the accessibility and quality of care as well as patient outcomes, and tracking critical incidents. The CDC, in collaboration with HRSA's Bureau of Maternal

and Child Health and HHS' Assistant Secretaries for Health (ASH) and Preparedness and Response (ASPR), could develop special guidance on asthma registries that encourages the development and implementation of uniform registry systems in all states and communities with the capability of providing accurate data on prevalence, incidence, and treatment by race, ethnicity, age and gender, and primary language spoken, so that over time, an accurate and current national and community picture of childhood asthma will emerge.

Reduction of asthma triggers in homes and the communities.

Encourage public health agencies, housing authorities and environmental agencies to promote evidence-based interventions and services that are essential to reducing the many environmental asthma triggers that lie beyond the control of any one family and fall outside of traditional "health care" interventions.

Learning what works and increasing knowledge.

Promote a strengthened and diversified Administration-wide research agenda to include basic, clinical and translational/implementation investigations.

Numerous federal agencies are involved in asthma research, but there is no coordinated strategic agenda that spans basic and health services research and that lays out a broader vision, beginning with what is known today, and focusing on what needs to be known in practice tomorrow, and where knowledge needs to go over the long term. With the emerging consensus around the importance of comparative and clinical effectiveness research, and in light of the 2009 reforms enacted by Congress to advance such research, it is time to fulfill the 2000 Congressional directive for a comprehensive asthma research agenda, bringing a fresh eye to the issue and coordinating the agenda to encompass both research that advances daily practice with research that will deepen knowledge about asthma and its causes.



Introduction

Introduction



“Looking back to my asthma days when I was a child, I think I have blocked a lot of it out. I was sort of traumatized by it, I think, in part because I was older when I was diagnosed, probably nine, and I used asthma medications (inhaler/nebulizer) until I was 16 or 17. I was self-conscious about it. I only had to go to the emergency room once for an asthma attack that turned into pneumonia and that required steroid treatment. I missed a month of school because of it. Although I did not have frequent attacks, each one was terrifying, a sort of panicked, hot-all-over feeling of trying to get enough air. I think the worst of it was being unable to do things like run and feeling “sickly.” Asthma made me feel fragile, as if my respiratory system was untrustworthy – and breathing is pretty fundamental!”

— Meagan,
diagnosed with asthma at age 9

Asthma is a serious and chronic condition that can be fatal. Grasping the magnitude of the condition requires translating asthma statistics into real-life events and outcomes. More than 10 million children have lifetime asthma, millions of whom have suffered an attack in the past year.ⁱ Every day children are rushed to the emergency department, and some are hospitalized as they struggle to breathe.ⁱⁱ Childhood asthma exacts a major toll on child health and family well-being.

Asthma places a heavy burden on children and families and is enormously costly to the health care system and society as a whole. For this reason, addressing the problem of childhood asthma is important at any time. But the challenge of effectively treating asthma at both the personal and social levels takes on added dimensions in a reform environment, as the nation looks for ways to expand coverage while attempting to bend the curve on health care spending, learning what works and adding to scientific knowledge, promoting system transparency, and improving population health, especially for those at highest risk of illness, disability, and death. Childhood asthma is a bellwether condition whose effective treatment tests our ability to make real change. Its management demands a team effort by families, health care professionals, and communities. A decisive effort to lessen the burden of asthma offers an unparalleled strategy for assessing over time whether the health system is moving in the right direction.

Unmanaged asthma flourishes at the intersection of system failure: failure on the part of health care providers to detect it and provide appropriate, guideline-based clinical management and a failure of some payers to properly incentivize these results; failure on the part of public health and social services programs to enable and empower families to address asthma triggers; failure of public health to vigilantly monitor communities for its presence and the quality of treatment; failure to invest in community prevention strategies; and failure to strategically plan for and invest in basic and health services research.

This report lays out the key facts – the extent of the problem of childhood asthma, the children at highest risk, what works, and what it will take to make what works available to all children. It finds that the tools we need are well within our grasp; what we need to do is use them and aim higher.

For comprehensive asthma treatment and management to reach children in need, several elements are essential, and collaboration and communication are key:

- Stable and continuous health insurance;
- High quality clinical care, case management, and asthma education available for all children, including those who remain ineligible for insurance coverage;
- The ability to continuously exchange information and monitor progress, using as much as possible health information technology or HIT;
- Reduction of asthma triggers in homes and communities; and
- Learning what works and increasing knowledge.

This report begins by laying out the dimensions of the challenge, as well as what is known about how to address asthma. It then examines what works and sets forth a series of policy recommendations aimed at translating this knowledge about what works into reforms that can benefit all children living with asthma.

This report focuses on public policy reforms, building on evidence to date from the peer-reviewed literature, as well as on prior reports resulting from expert consensus reviews, and relevant policy reports (including the American Lung Association’s “A National Asthma Public Policy Agenda,” 2009; the Public Health Foundation’s “We Can Do Better: Improving Asthma Outcomes in America,” 2009; and the RAND Corporation’s “Health: Improving Childhood Asthma Outcomes in the United States A Blueprint for Policy Action,” 2001.)ⁱⁱⁱ



What We Know

What We Know

THE MAGNITUDE OF THE PROBLEM

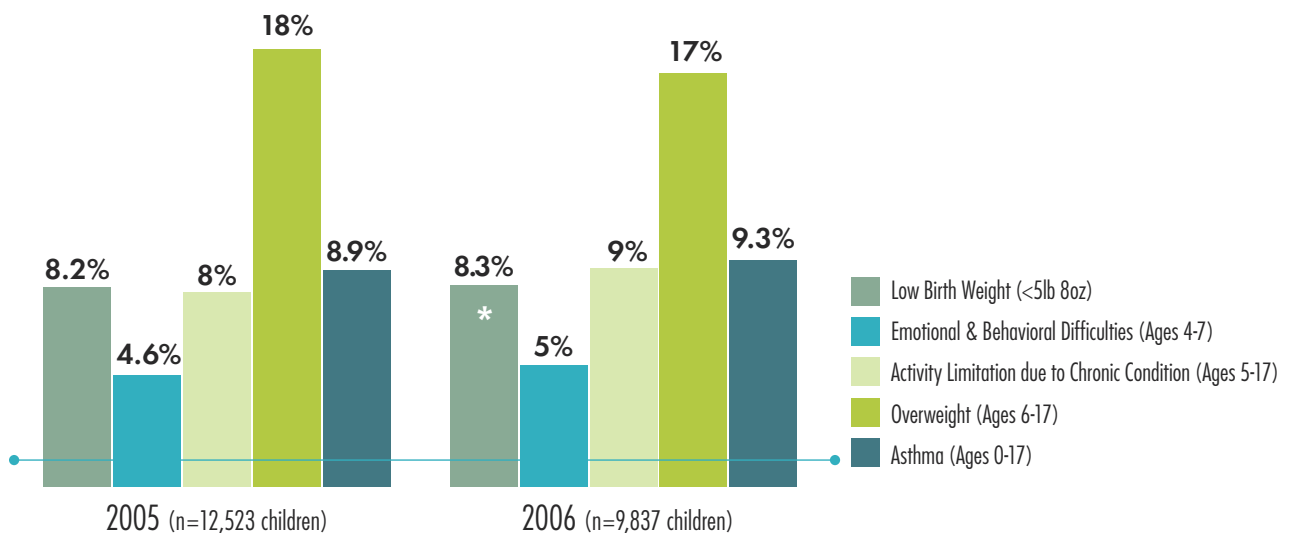
Asthma is a chronic lung disease that cannot be cured, although treatment options exist to manage the disease and its symptoms.^{iv} Asthma inflames and narrows the bronchial tubes, the lungs' airways.^v It causes recurring periods of wheezing (a whistling sound when breathing), chest tightness, shortness of breath, and coughing, which tend to occur at night or early in the morning.^{vi} Asthma affects people of all ages, but it most often begins in childhood.^{vii} Even when children with asthma are feeling fine, the condition can flare up at any time. Asthma can impose serious limitations on the normal activities of childhood and can lead to death.^{viii}

Prevalence of Asthma

There is no uniform system currently available that — in real time and at a community level — can measure the presence of asthma among children as well as the proportion of children with asthma who are receiving appropriate treatment. Instead, there are a series of studies that provide insight into childhood asthma prevalence, which show a range of prevalence rates from 9–14 percent depending on the ages of children included and the definition of asthma (e.g., ever diagnosed with asthma or lifetime asthma vs. current asthma). In this report, we use data largely drawn from the National Health Interview Survey (NHIS) and the Medical Expenditures Panel Survey (MEPS), employing other studies at various points to illustrate important population differences and patterns.

Asthma is not only serious, it is widespread. In 2008, 14 percent of all children (one in seven)^{ix} had lifetime asthma and 9.4 percent of all children (one in 11) had current asthma at the time when they were surveyed, making it second only to childhood obesity in prevalence (Figure 1). (Evidence suggests a potential link between childhood obesity and the presence of asthma.)^x

Figure 1: Asthma is the Second Most Prevalent Child Health Condition, 2005-2006

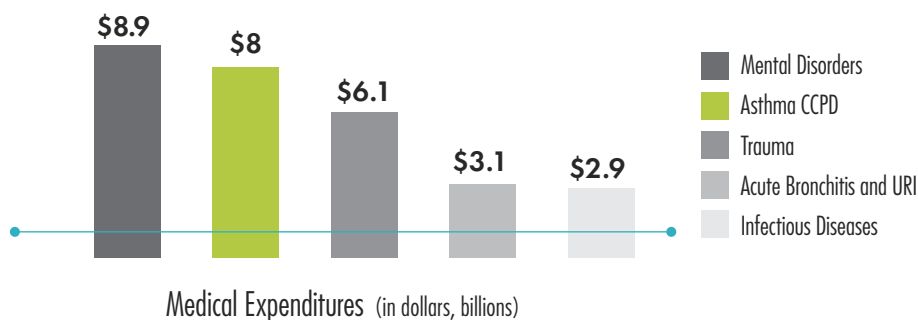


* The increase in the percentage of children born LBW at birth is the only statistically significant difference between 2005 and 2006.
Source: Center for Disease Control and Prevention, National Center for Health Statistics. National Health Interview Survey, 2005-06

Not Only Common, Also Costly

Serious asthma is not only common (Figure 1), it is costly (Figure 2). On an annual basis, asthma and other pulmonary diseases represent the single most common chronic condition for which children are treated (12.9 million in 2006 according to MEPS data):^{xi} Furthermore, compared to other childhood diseases, childhood asthma – particularly when poorly managed – is extremely costly to treat (Figure 2).

Figure 2: Asthma Costs for Children, 2006



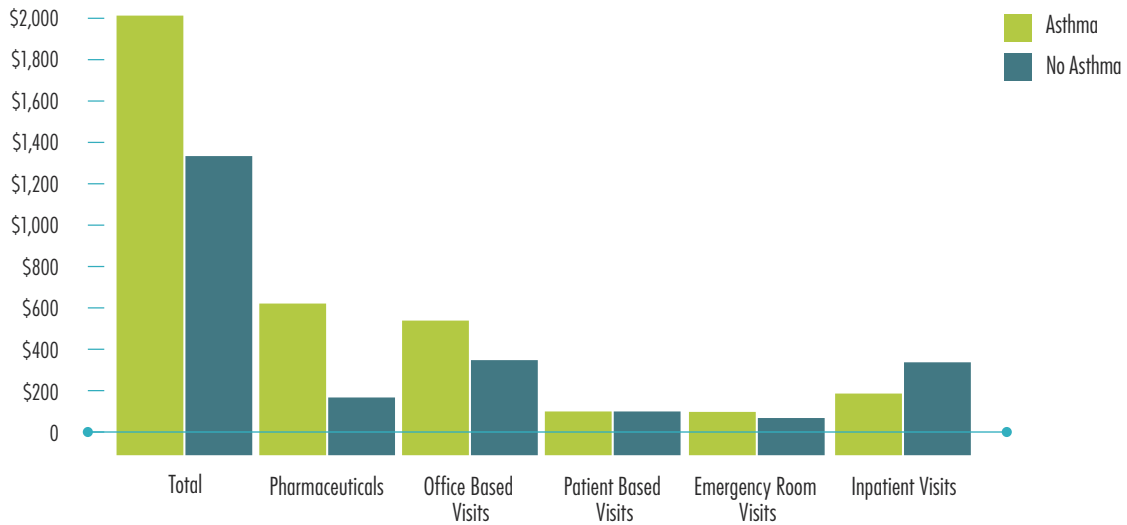
Source: Soni, Anita, Statistical Brief #242, April 2009, Rockville, MD: AHRQ

Asthma adds about 50 cents to every health care dollar spent on children with asthma compared to children without asthma. Average total health care expenditures in 2006 (which included pharmaceuticals, office-based visits, outpatient hospital visits, emergency room visits, and inpatient visits) for children with asthma were \$1,906 compared to \$1,263 for children who were not diagnosed with asthma (Figure 3), while average health care expenditures for all children ages 0 to 17 were \$1,330 per child in 2006. Compared with children who do not have asthma, pharmaceutical expenditures are nearly four times higher for asthmatic children, outpatient office-based expenditures are 55 percent higher, and emergency department care is 40 percent higher (Figure 3). Asthma was associated with 13.6 percent of all pediatric hospitalizations in 2006, and children with asthma who use emergency room care are significantly more likely than children without asthma to require inpatient admission (65 percent v 44 percent)^{xii}. In 2005, in a sample of community hospitals in 23 states, asthma was found to be the second most common cause of emergency department visits that led to hospitalizations.^{xiii}

Asthma adds about 50 cents to every health care dollar spent on children with asthma compared to children without asthma.

What We Know

Figure 3: Pediatric Health Care Spending - Children With and Without Asthma, 2006

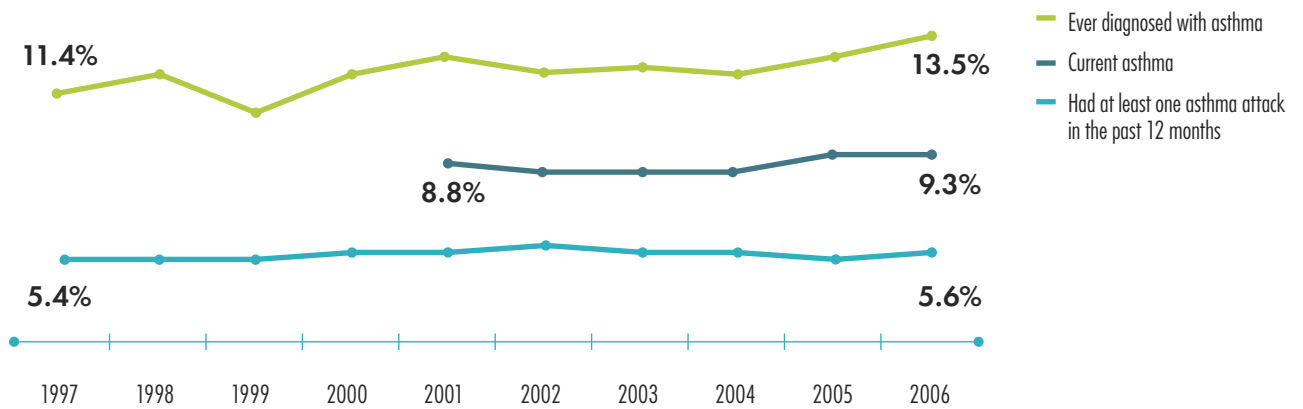


Source: Dor, A. Rochard P., Tan, E. (2009). Analysis of 2008 MEPS Data. Washington, DC: GWU.

Not a Quiet Presence

Asthma is not a quiet presence. Nearly one out of every 16 children has experienced an asthma attack in the preceding 12 months (Figure 4), and in the case of children already diagnosed with asthma, 60 percent have experienced an attack within the past year. These figures have increased slightly over the past decade as has the proportion of children with asthma (Figure 4).

Figure 4: Asthma Attacks in the Past 12 Months, 1997-2006



Source: Centers for Disease Control and Prevention. National Center for Health Statistics. National Health Interview Survey.

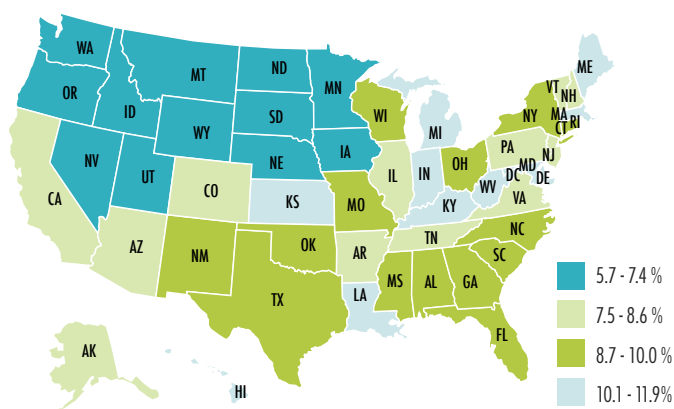
Certain Children Face a Higher Asthma Burden

Asthma is a nationwide problem, but its prevalence varies geographically, socio-economically, and by race and ethnicity.

Geography

- More than a third of children (37 percent) in the United States aged 0-17 live in the South, and 34 percent of children with asthma live in the South (2008 Census and 1996-1997 and 1999-2000 MEPS data). In the rest of the country, children with asthma are otherwise evenly distributed among the three regions (Northeast: 20 percent, Midwest: 23 percent, and West: 23 percent).^{xiv}
- Across the country, state asthma prevalence varies, with even the lowest ranges still unacceptably high, and many states reporting 10-12 percent prevalence (Figure 5). An astonishing 19 percent of all Puerto Rican children have asthma. While the majority of children with asthma live in metropolitan statistical areas (MSAs), 20 percent of all children with asthma^{xv} live outside a metropolitan region, in communities that are more sparsely populated and more highly rural.^{xvi}

Figure 5: Childhood Asthma is National in Scope but More Common in Certain States, 2003



Source: Analysis of National Survey of Children's Health by Akinbami et al., PEDIATRICS Volume 123, Supplement 3, March 2009 S131 www.pediatrics.org. Sample included 102,353 child-level interviews completed nationally, and approximately 2,000 interviews collected per state ranging from 1,483-2,241.

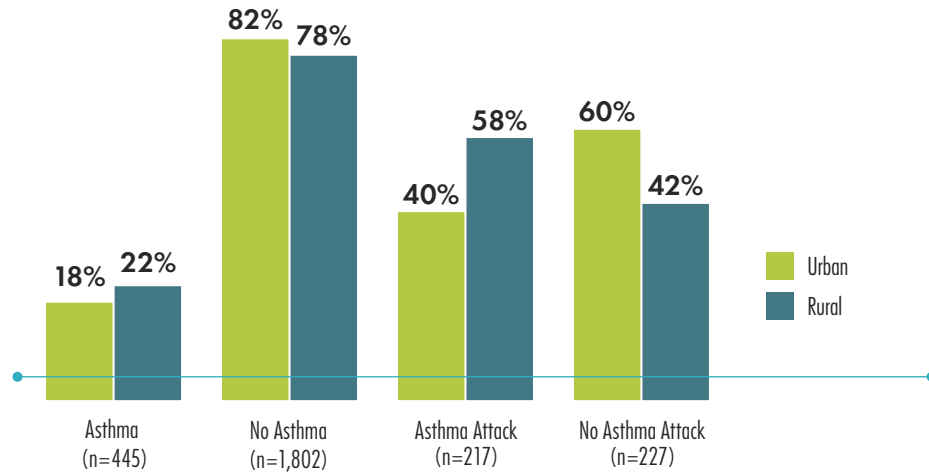
- Systematic community-level information about asthma prevalence is lacking. But the data that do exist suggest that certain communities can be considered risk-epicenters because the prevalence of asthma is so far above the national average. For example, in Massachusetts, where the Department of Public Health has mapped asthma in 350 communities, one community (West Brookfield) showed a childhood asthma prevalence of more than 43 percent for the 2006-2007 school years, with

four other communities having prevalence above 20 percent, and the remaining hovering between 5-15 percent.^{xvii} In Los Angeles County, California in 2008, the prevalence of childhood asthma was 14.2 percent and emergency department visits for children aged 0-17 were 69 per 10,000 residents.^{xviii}

- Urban/rural information is also not widely available. But among children who receive their care from community health centers, which report cases, the prevalence of asthma is virtually identical, regardless of urban/rural setting (Figure 6). However, a higher proportion of pediatric patients of rural health centers have experienced an asthma attack.

What We Know

Figure 6: Urban and Rural Children Seen at Health Centers Have Comparable Rates of Asthma, 2002



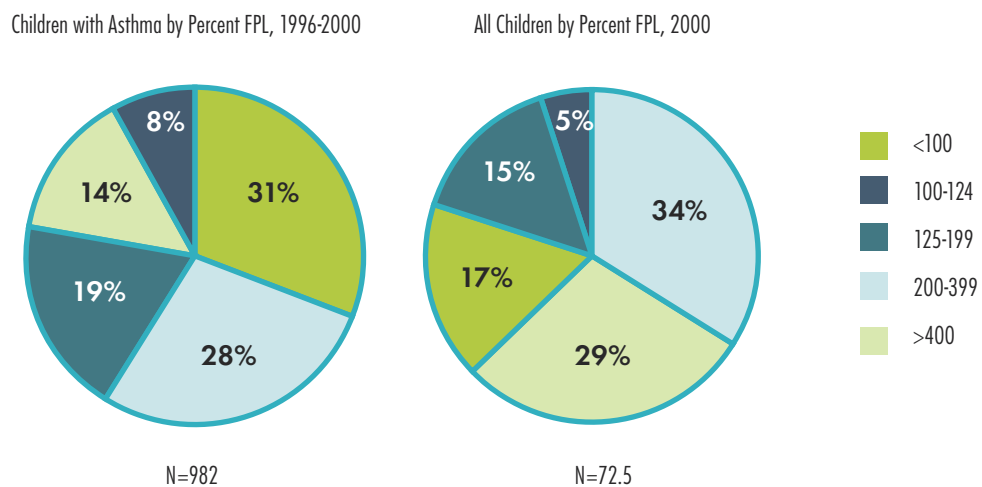
Source: 2002 CHC User Survey, HRSA, DHHA. Sample was weighted and included data from 2,129 interviews and augmented by 3,028; medical

Poverty, race, and ethnicity

As with other preventable and treatable conditions, poverty is a significant asthma predictor. Moreover, racial and ethnic disparities are clearly evident.

- 20 percent of children seen at health centers are reported to have asthma. Health center patients are far more likely to be low income (91 percent have family incomes below 200 percent of the federal poverty level of \$44,100 for a family of four in 2009) than the general population, and are significantly more likely to be members of racial and ethnic minority groups (37 percent were white non-Hispanic, 36 percent Hispanic, 23 percent African-American, 3 percent Asian, and 1 percent Native American in 2006).
- Low income children account for approximately 37 percent of all U.S. children;^{xix} but they represent nearly three in five (58 percent) children with asthma (Figure 7).

Figure 7: Children with Asthma are Disproportionately Low Income, 1996-2000



Source: Kim *et al.* (2009). Health Care Utilization by Children with Asthma, Preventing Chronic Disease Vol. 6: No. 1 AND Medical Expenditure Panel Survey (2000).

African-American children are nearly seven times as likely as white children to experience death from asthma (Table 1). Asthma prevalence appears to be higher not only among African-American children but also among American Indian, and it is particularly elevated among Puerto Rican children.^{xx} The consequences of asthma also appear to be greater for minority children, with more missed days of school or work, increased rates of hospitalizations and emergency room visits and elevated risks for mortality.^{xxi}

...poverty is a significant asthma predictor. Moreover, racial and ethnic disparities are clearly evident.

Table 1. Childhood Asthma Prevalence by Race and Ethnicity

CHILDREN AGES 0-17 (2004-2005)	PREVALENCE (percent of children with current asthma at time of survey)	DEATHS (per 1 million children)
Total	8.7	2.4
Race		
Black	12.8	9.0
White	7.9	1.3
American Indian/ Alaska Native	9.9	—
Asian	4.9	—
Race/Ethnicity		
Hispanic	7.8	1.5
Puerto Rican	19.2	—
Mexican	6.4	1.3
Non-Hispanic Black	12.7	8.8
Non-Hispanic White	8.0	1.2

— = data not available/ sample too small

Source: Akinbami et al., PEDIATRICS Volume 123, Supplement 3, March 2009 S131 www.pediatrics.org

Lower health care expenditures reflect differences in both utilization and cost. Health care expenditures for African-American children with asthma averaged \$1,153 in 2006, a spending level 49 percent less than the average amount spent on white children with asthma (Figure 8). This disparity is largely explained by lower expenditures on pharmaceutical and office-based services; on average, health expenditures for African-American children with asthma were 47 percent lower for pharmaceuticals and 46 percent lower for office-based care (Figure 8). Similar disparities can be seen in the case of Hispanic children: as with African-American children, this disparity is largely explained by lower pharmaceutical and office-based expenditures. In contrast, in the case of Hispanic children with asthma, expenditures for emergency room care were more than double (103 percent) the ER expenditures for white children with asthma.

What We Know

Figure 8: Health Expenditures are Lower for Minority Children, Particularly for Pharmaceutical and Outpatient Care, while Emergency Room Expenditures are Higher, 2006



Source: Dor, A., Richard, P., Tan, E. (2009) Analysis of 2006 MEPS Data. Washington, DC: George Washington University.
 Note: White children with asthma are the reference group. Statistical significance is indicated through the p-value: * <.1 ** <.05 *** <.01

Although differences in expenditures between the groups in Figure 8 may be partly the result of variations in health care costs across communities, further analysis suggests that disparities in expenditures tend to reflect disparities in the actual level of care received. While the average African-American child with asthma made 2.6 office-based visits and annual visits averaged 3.6 for Hispanic children, white children showed an annual visit rate in 2006 of 6.0 visits.

ASTHMA RISK FACTORS

Asthma is the result of many factors. Some are not controllable. Others, however, are amenable to intervention.

Factors That **Cannot** Be Controlled

Among children, certain immutable characteristics, such as gender and genetic predisposition, seem to be predictors of asthma. A history of allergies also appears to be a predictor (Figure 9). For children with these risk factors, paying attention to controllable risks may be especially important.

Figure 9: Non-Controllable Asthma Risk Factors Among Children

RISK FACTOR	
Gender	Boys have asthma more often than girls.
Race	Asthma is more common among black children than white children.
Ethnicity	Asthma is more common among certain Hispanic children than non-Hispanic children.
Genetic Predisposition	Children with a genetic predisposition to asthma have an inherent tendency to have bronchial tubes overreact.
Individual History of Allergies	Children with an allergy are more likely than other children to develop asthma.
Family History of Allergies & Asthma	Children with asthma and allergies often come from families who have had allergies and asthma.

Factors That Can Be Controlled

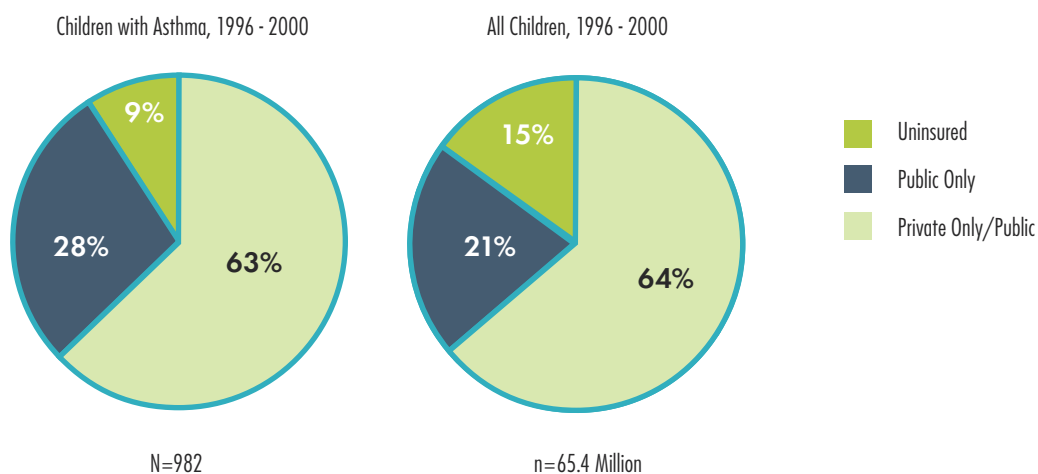
A major body of research into the effective management and treatment of asthma underscores five major risk factors that can be controlled or changed through intervention:

- Inadequate access to appropriate, high quality health care and case management;
- A failure to address the indoor air environment and other indoor asthma triggers;
- Failure to systematically address outdoor environmental triggers that affect communities in which children live and grow;
- The absence of a means for monitoring asthma prevalence and treatment in order to effectively deploy resources; and
- A coordinated research strategy.

Inadequate Access to Appropriate Health Care

Access to appropriate health care for children with asthma begins with stable and comprehensive health insurance that makes care accessible and affordable and which has been shown to have a significant impact on health care utilization and health outcomes.^{xvii} Yet an estimated eight million children are uninsured, and 70 percent of these children are thought to be eligible for CHIP or Medicaid but not enrolled. Millions more experience lapses in health insurance coverage as a result of changing family income and living circumstances, both of which can affect coverage. Low income children with asthma are estimated to be somewhat less likely than those without asthma to be uninsured (Figure 10). But even among these children, nine percent have been estimated to be uninsured. Using 2006 data, this translates into 1.17 million uninsured children with asthma (out of a total of 12.9 million in 2006).

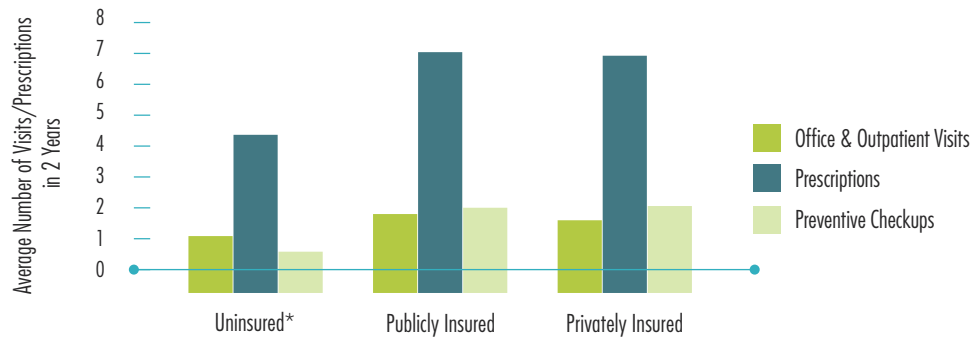
Figure 10: Nine Percent of Children with Asthma are Uninsured, 1996-2000



What We Know

The evidence shows that uninsured children with asthma receive fewer office and outpatient visits, prescriptions, and preventive checkups than publicly-insured children (Figure 11).^{xxiii}

Figure 11: Uninsured Children with Asthma Use Fewer Services, 1996-2000



Source: Kim et al. (2009). Health Care Utilization by Children with Asthma, *Preventing Chronic Disease* Vo. 6: No. 1

Even if only half of uninsured children with asthma are eligible for Medicaid or CHIP (a lower figure, given their higher rate of public insurance coverage), this lower estimate nonetheless means that 4.5 percent of all children with asthma (nearly 600,000) may be uninsured yet eligible for Medicaid or CHIP.

Beyond insurance coverage is the question of whether health care is accessible. Using data on the prevalence of medical underservice among the population, we estimate that approximately 24 million children live in urban and rural communities that are classified as medically underserved because of the shortage of primary health care, the higher poverty and health risks these communities experience, or a combination of these factors. Not surprisingly, because low family income is a predictor of medical underservice, among publicly-insured children with asthma, reliance on emergency departments is elevated compared to privately-insured children.^{xxiv}

Even where access exists, care may be clinically incomplete and inadequate. It has been estimated that less than 50 percent of children with asthma receive quality care, indicating a severe under-provision of recommended clinical services.^{xxv} Expert guidelines from the NHLBI/NAEPP (Figure 12) present comprehensive recommendations on clinical practice standards that build on the best evidence.

Even where access exists, care may be clinically incomplete and inadequate. It has been estimated that less than 50 percent of children with asthma receive quality care.

Figure 12: Preventing, Diagnosing, Treating and Managing Asthma

<p>PREVENTION:</p> <ul style="list-style-type: none"> - Daily preventive medication (see Treatment, to the right) - Health education of children and their families - Environmental remediation in the home to address triggers 	<p>TREATMENT:</p> <ul style="list-style-type: none"> - Asthma treatment plan tailored to the child to control asthma daily over the long term (daily controller medicine, e.g., inhaled corticosteroid with spacer) - Asthma action plan tailored to the child to treat asthma attacks when they occur (quick relief medicine, e.g., albuterol)
<p>DIAGNOSIS:</p> <ul style="list-style-type: none"> - Routine checkups, including clinical assessments (there is currently no sensitive and specific diagnostic test), with a recommended frequency of checkups determined by clinical judgment depending on how a child's asthma is classified: <ul style="list-style-type: none"> • Every six months for children with intermittent or mild persistent asthma that has been under control for at least three months. • More often than every six months for children with uncontrolled or severe persistent asthma or for children who need more supervision. - Spirometry - Peak expiratory flow (PEF) - Chest x-ray, sweat test and other tests to rule out asthma - Allergy tests for an individual risk assessment 	<p>MANAGEMENT:</p> <ul style="list-style-type: none"> - Child and family follow a plan, which includes pharmacologic therapy, tailored to the child to control asthma - Primary care and specialist physicians teach skills to use child's asthma treatment and action plans - Nurses, social workers, community health workers conduct regular home visits to provide ongoing asthma education, periodic health and environmental risk assessment, and environmental remediation - Documentation of all encounters for monitoring and evaluation

Source: "Expert Panel Report 3 Summary Report 2007: Guidelines for the Diagnosis and Management of Asthma" and "EPR-3: Full Report 2007" (<http://www.nhlbi.nih.gov/guidelines/asthma/asthgdln.htm>).

But current national system performance standards fail to capture many of these recommended clinical standards, particularly asthma education, case management, and environmental remediation. Additionally, one of the two system guidelines does not capture management of co-occurring conditions (Figure 13). However, a recently released set of proposed measures by the National Committee for Quality Assurance (NCQA) and the American Medical Association (AMA)'s Physician Consortium for Performance Improvement® (PCPI) do address asthma control specifically looking at tobacco smoke exposure in the home, in addition to other health care measures.

What We Know

Figure 13: Recommended Clinical Standards Compared to Performance Measures for Asthma

ASTHMA CATEGORIES	CLINICAL STANDARDS	PERFORMANCE MEASURES	
	NAEPP EPR3 Guidelines for the Diagnosis & Management of Asthma	National Quality Forum Measures	CHIPRA Children's Health Quality Core Measures, AHRQ
Asthma Measurement	Yes	Yes ¹	No
Asthma Management: Asthma Education	Yes	No	No
Written Action Plans	Yes	Yes ^{2, 3}	Yes ^{4, 5}
Case Management	Yes	No	No
Management of Co-morbid Conditions	Yes	No	Yes ⁶
Environmental Remediation	Yes	No	No
Appropriate Medication	Yes	Yes ^{7, 8, 9, 10}	Yes ^{11, 12, 13}
Hospitalizations & Use of ED	No	Yes ¹⁴	Yes ^{15, 16}

Source: Lyon, M., Rosenbaum, S., Markus, A. Washington, DC: GWU

¹ Asthma Assessment-Percentage of patients who were evaluated during at least one office visit for the frequency (numeric) of daytime and nocturnal asthma symptoms

² Management plan for people with asthma-Percentage of patients for whom there is documentation that a written management plan was provided either to the patient or the patient's caregiver or at a minimum, specific written instructions on under what conditions the patient's doctor should be contacted or the patient should go to the emergency room

³ Home Management Plan of Care Document Given to Patient/Caregiver- Documentation exists that the Home Management Plan of Care (HMPC) as a separate document, specific to the patient, was given to the patient/caregiver, prior to or upon discharge.

⁴ From 3rd round of measures that did not meet thresholds for Delphi II scoring, CHIPRA Children's Healthcare Quality Measures, AHRQ: Percentage of patients for whom there is documentation of a written asthma action management plan was provided either to the patient or the patient's caregiver OR, at a minimum, specific written instructions on under what conditions the patient's doctor should be contacted or the patient should go to the emergency room

⁵ AHRQ, Joint Commission only measure: Children's asthma care: percent of pediatric asthma inpatients with documentation that they or their caregivers were given a Home Management Plan of Care (HMPC) document

⁶ From 2nd round of measures that passed Delphi II but not recommended, CHIPRA Children's Healthcare Quality Measures, AHRQ: Annual influenza vaccination (all children and adolescents diagnosed with asthma)

⁷ Suboptimal Asthma Control (SAC) and Absence of Controller Therapy (ACT)- Rate 1: The percentage of patients with persistent asthma who were dispensed more than 5 canisters of a short-acting beta2 agonist inhaler during the same three-month period. Rate 2: The percentage of patients with persistent asthma during the measurement year who were dispensed more than five canisters of short-acting beta2 agonist inhalers over a 90 day period and who did not receive controller therapy during the same 90-day period.

⁸ Use of Appropriate Medications for People with Asthma-Percent of patients who were identified as having persistent asthma during the measurement year and the year prior to the measurement year and who were dispensed a prescription for either an inhaled corticosteroid or acceptable alternative medication during the measurement year

⁹ Asthma Pharmacologic Therapy-Percent of all patients with mild, moderate, or severe persistent asthma who were prescribed either the preferred long-term control medication (inhaled corticosteroid) or an acceptable alternative

¹⁰ Use of Systemic Corticosteroids for Inpatient Asthma-Percentage of pediatric asthma inpatients (age 2-17 years) who were discharged with principle diagnosis of asthma who received systemic corticosteroids for inpatient asthma.

¹¹ From 2nd round of measures that passed Delphi II but not recommended, CHIPRA Children's Healthcare Quality Measures, AHRQ: Use of appropriate medications for people 5-20 years of age with Asthma-Average number of member controller months

¹² AHRQ, Joint Commission only measure: Children's asthma care: percent of pediatric inpatients who receive systemic corticosteroids during hospitalizations

¹³ AHRQ, Joint Commission only measure: Children's asthma care: percent of pediatric asthma inpatients who received relievers during hospitalization

¹⁴ Use of Relievers for Inpatient Asthma-Percentage of pediatric asthma inpatients, age 2-17, who were discharged with a principal diagnosis of asthma who received relievers for inpatient asthma

¹⁵ Annual number of asthma patients (> 1 year old) with > 1 asthma-related ER visit

¹⁶ From 2nd round of measures that passed Delphi II but not recommended, CHIPRA Children's Healthcare Quality Measures, AHRQ: Annual number of asthma patients (>1 year old) with >1 asthma-related hospitalization

System information exchange and transparency measures are missing. Neither the NIH clinical practice guidelines nor the system performance measures capture providers' ability to use HIT in practice, to exchange data with other clinical providers and health care entities, to exchange data with school systems and other community programs serving children with asthma, or to report treatment and management data to payers or public health agencies. For example, there are no measures that might be used to capture hospital performance in reporting childhood asthma emergency room cases or inpatient admissions to a child's primary care physician or to a public health agency. No measures have yet been developed to determine the effectiveness of reporting from ambulatory care settings into a public health treatment registry, or the effectiveness of reporting between a public health registry and payers.

Failure to Address the Indoor Air Environment

Environmental risk factors play a documented role in triggering childhood asthma and interfering with its control. The evidence to date shows that exposure to cigarette smoke, other irritants (such as strong odors and nitrogen dioxide) and certain allergens increases children's risk of developing – or losing control of – asthma (Figure 14).

Figure 14: Tobacco, Dust Mites Pests and Pets Represent Major Environmental Risk Factors

EXPOSURE TO TOBACCO SMOKE	INDOOR ALLERGENS & IRRITANTS
<p>Cigarette smoke. Children who smoke at least 300 cigarettes per year are three to four times more likely to develop asthma by the time they graduate high school.^{xxvi}</p>	<p>Dust mites. Exposure to dust mites increases a child's risk for developing asthma and exacerbating asthma.^{xxxii}</p>
<p>Cigarette smoking during pregnancy. Women who smoke during pregnancy increase the risk of wheezing (a symptom of asthma) in their babies who also have worse lung function than babies whose mothers did not smoke.^{xxvii} Children exposed in utero who become frequent, regular smokers are nine times more likely to have new onset of asthma compared to non-exposed smokers.^{xxviii}</p>	<p>Pests and cockroaches. Children who have a high level of cockroach droppings in their home are more likely to have a new diagnosis of asthma and asthma attacks when they have asthma than children whose homes have a low level.^{xxxii}</p>
<p>Exposure to environmental tobacco smoke. Children who are exposed to environmental tobacco smoke are at increased risk for developing asthma, and if they already have asthma, they are more likely to experience increases in the severity of their symptoms.^{xxix, xxx}</p>	<p>Pets. The evidence on the effect that pets in the home have on developing asthma is unclear but suggests that if a child has asthma, being around a pet at home may worsen his condition.^{xxxiii, xxxiv} But other research shows that being around multiple pets, particularly dogs, early in life might actually protect a child against developing asthma.^{xxxv}</p>

What We Know

Failure to address outdoor air quality in communities in which children live, particularly communities facing higher social, economic, and health risks

The failure to address outdoor air quality perpetuates children's exposure to pollutants which can trigger or exacerbate asthma.

Air pollution, ozone specifically, has been shown to be associated with asthma triggers and respiratory problems like wheezing and shortness of breath.^{xxxvi} In 2007, the EPA estimated that 64 percent of children lived in counties where the eight hour ozone standard was violated at least one day a year.^{xxxvii} Researchers estimate that among children with asthma, more than 60 percent live in a community where one or more federal air quality standards are not being met.^{xxxviii} Outdoor and indoor air quality are implicitly linked, and this link further reinforces the need for parallel efforts to reduce pollutants in the outdoor environment and improve the quality of the air children breathe outside, as well as inside their homes and schools. These efforts span a range of activities, including restricting emissions and other air pollutants, reducing environmental tobacco smoke and ensuring schools are built away from congested roadways.

The absence of a means for monitoring asthma prevalence and treatment in order to effectively deploy resources

Underlying these challenges is the absence of an effective system for monitoring the prevalence of asthma at the national, state, and community levels and for gauging the availability or effectiveness of treatment and its outcome on child health. In 1999, the President's Task Force on Environmental Health Risks and Safety Risks to Children issued a report entitled "Asthma and the Environment: A Strategy for Children." Although the report generally lacked specific recommendations for federal agency action, it did call for a coordinated nationwide surveillance and monitoring system that would allow for data collection and analysis at all levels. This recommendation has yet to be implemented.^{xxxix}

The data in this report are drawn from a series of important yet disconnected studies that provide national estimates of prevalence. What is lacking is a systematic approach to asthma monitoring that

captures information on the prevalence of asthma. Similarly, there is a lack of a uniform approach to the development of asthma treatment registries so that regardless of the community, health care professionals and health care institutions can work with public health agencies to maintain essential information on children who are receiving effective treatment or children who have experienced asthma-related emergency department care or an inpatient admission. Because these basic tools are absent, it is not possible to know about the prevalence of childhood asthma or the quality of care for all communities. Furthermore, it is impossible for public health agencies to effectively engage with health care professionals, insurers, schools, state and local environmental and public housing agencies, and other relevant agencies, to deploy resources and improve coordinated interventions that simultaneously upgrade the accessibility and quality of care, while also supporting community-wide health education and risk reduction activities.

The absence of a coordinated research strategy

Asthma is a condition that calls for two types of research: The first is applied research that operates in routine care and on the ground and allows public health officials, treating health care professionals, and community providers to test and evaluate the effectiveness of different types of interventions. These interventions include different approaches to asthma education, different types of care settings, the impact on adherence rates of different approaches to care management, or effective ways to triage children from emergency care episodes into stable and ongoing care arrangements. The second is basic and early translational research that enables discovery and development of therapeutic and diagnostic modalities. Despite the disproportionately large number of funded basic and clinical studies, remaining key research questions that focus on gaining a greater understanding of elevated childhood asthma risk include the role of viral or bacterial infections, the presence of certain antibodies (especially IgE, a class of antibodies that plays an important role in allergies and asthma), nutrition and diet, lifestyle, and other factors. Yet despite the fact that numerous agencies are involved in asthma research (Figure 15), no single unified research agenda exists.

Figure 15: Numerous Federal Agencies are Currently Involved in Research and Policy Initiatives that Address Childhood Asthma

HEALTH & HUMAN SERVICES, INCLUDING:	<ul style="list-style-type: none"> • Agency for Healthcare Research and Quality • Centers for Disease Control and Prevention • Centers for Medicare and Medicaid Services • Food and Drug Administration • Health Resources and Services Administration • National Institutes of Health <ul style="list-style-type: none"> - National Heart, Lung, and Blood Institute - National Institute of Allergy and Infectious Diseases - National Institute of Environmental Health Sciences - National Institute of Child Health and Human Development - National Center on Minority Health and Health Disparities • Office of Minority Health
HOUSING & URBAN DEVELOPMENT	
ENVIRONMENTAL PROTECTION AGENCY	
DEPARTMENT OF EDUCATION	

Air pollution, ozone specifically, has been shown to be associated with asthma triggers and respiratory problems like wheezing and shortness of breath.

WHAT WORKS: WE KNOW ENOUGH TO ACT

Because childhood asthma is a condition with roots that are both biological and environmental, and because of what it takes to achieve effective control, asthma can be thought of as an important measure of health system performance. At the most immediate level, progress in preventing and managing asthma depends on engaged and empowered families who have the tools they need to care for their children. Some families have all of the resources they need to manage asthma without additional help. But many families do not, thus facing hardships brought on by low family income, a lack of stable insurance coverage, and residence in communities without adequate primary care resources and threatened by serious environmental problems.

Empowering all families requires the presence of policies that incentivize high performance and careful coordination among several key health system players. The elements for improving childhood asthma outcomes include the following:

- Stable and continuous health insurance;
- High quality clinical care, case management, and asthma education available for all children, including those who remain ineligible for insurance coverage;
- The ability to continuously exchange information and monitor progress, using as much as possible health information technology or HIT;
- Reduction of asthma triggers in homes and communities; and

What We Know

- Learning what works and increasing knowledge.

Undergirding these key players are two foundational activities. The first is an information system that can yield information about asthma prevalence at the community level, the rate and location of critical incidents that require follow-up such as a hospital inpatient admission or death, and information on the proportion of children receiving effective treatment. The second is an overarching research strategy that produces information about what works in clinical care and asthma management and that adds to the scientific knowledge base about asthma.

- **Stable and continuous insurance coverage**

Stable and continuous insurance coverage that makes care affordable and accessible and incentivizes appropriate utilization and high quality clinical performance is the foundation on which health care rests. In this regard, because asthma is disproportionately concentrated among lower income children, Medicaid and CHIP are particularly key. Reforms enacted in 2009 added \$33 billion for coverage of children, enabling programs to reach an additional 4 million children by 2013.^{xi} Together, the two programs both allow states to expand the reach of health insurance while incentivizing enrollment and retention of eligible children. As of 2009, 29 million children were enrolled in Medicaid and seven million in CHIP. The Children's Health Insurance Program Reauthorization Act (CHIPRA) provides enhanced funding to permit coverage of children in families with incomes up to 300 percent of the federal poverty level, while providing federal assistance at regular Medicaid matching rates in states that elect to extend coverage still further. Were all states to increase coverage to 300 percent of the federal poverty level, an additional one million children beyond those who are already eligible but unenrolled would be eligible for Medicaid or CHIP. Of this number, an estimated 180,000 would be previously uninsured children with asthma. CHIPRA allows states to reach all financially eligible legally resident children during the first five years of their U.S. residency. CHIPRA further simplifies citizenship documentation requirements and provides bonus payments to states whose enrollment and retention efforts produce enrollment levels that exceed their target rates. Full implementation of these reforms could help reach the nearly 600,000 children with asthma who are eligible for coverage today but remain unenrolled. CHIPRA also provides \$100 million in outreach funds, establishes a multi-year clinical quality improvement initiative, and contains demonstration funding to improve the use of health information technology. Existing Medicaid and CHIP provider payment policies permit the use of payment arrangements, through direct coverage or the use of managed care arrangements that incentivize provider adherence to clinical quality standards. National health system performance measurement tools already contain certain measures of clinical quality performance related to childhood asthma.

- **High quality clinical care, case management, and asthma education available for all children, including those who remain ineligible for insurance coverage, and comprehensive and continuing clinical care in a medical home that contains important links to community and home settings**

The quality of the clinical care available to children with asthma is critical. Figure 12, above, showed the elements of recommended clinical practice in the case of pediatric asthma based on the latest NHLBI/ NAEPP guidelines. These elements boil down to a key imperative: a medical home with skilled and knowledgeable health care professionals who, acting as a team, continuously monitor the child's health status over time and manage the medications that are crucial to improved long-term lung function (not merely episodic management of attacks). Furthermore, health care professionals must be able to effectively communicate to children and families at an appropriate literacy level (including having easily comprehensible health education materials and written asthma action plans), so that families are armed with the knowledge and information they need to reduce risks and manage their children's condition. In addition to effective communication with families, health professionals must be able to communicate with each other in the treatment and management of asthma, through the appropriate and efficient use of HIT.

The importance of health education in both clinical care and community settings cannot be overstressed if the aim is to empower families with the knowledge and tools to act. Some families whose children have asthma are able to put knowledge into practice on their own. Other families, whose children may be at the highest risk, also face added barriers of poverty, family stress, and other factors that can limit their ability to turn knowledge into action. For these families, the health care system needs to be able to support them outside of the office practice and in community settings through home visits and case management supports. Figure 16 displays the elements of health education and child and family support, while Figure 17 illustrates the important elements necessary in school environments to help families and children with both the treatment and management of asthma.

Figure 16: Key Components of Asthma Health Education^{xli}

- Individually tailored to child needs, including intensity (research suggests a dose-response)
- Appropriate health literacy level
- Self-management techniques (eg. peak flow) and medication education
- Education about environmental remediation and trigger reduction strategies in the home
- Conducted in concert with an individually tailored written action plan

Sources: Coffman et al. 2008; Ducharme et al. 2008; Purmort et al. 2000; Wood et al. 2006

Figure 17: Asthma and the School Environment^{xlii}

- School-based health centers with sufficient time from a school nurse
- Individualized case management from school nurse, including having access to a child’s written action plan
- Self-management techniques (eg. peak flow) and medication education
- In-service asthma education and trigger reduction education to teachers and school personnel
- Individual and small group health education sessions on asthma management
- Education sessions for parents (for young children) about asthma management (including symptom identification and education about controller and rescue medication)

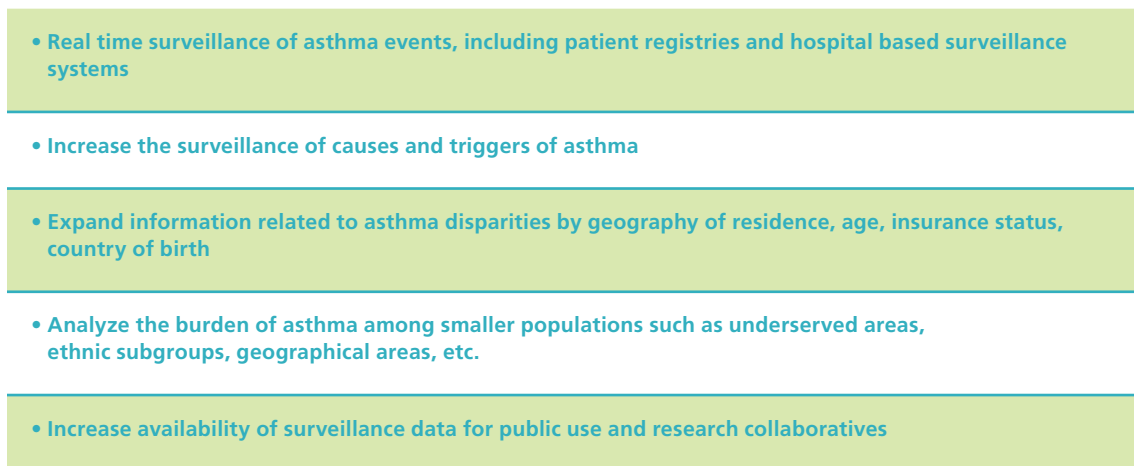
Sources: Adams et al. 2000; Levy et al. 2006; Purmort et al. 2000; Webber et al. 2003

What We Know

- **The ability to continuously exchange information and monitor progress, using as much as possible health information technology.**

Knowing which communities experience a particularly great burden of asthma and the number of children receiving effective treatment, tracking serious incidents such as the hospitalization or death of a child from asthma, and having the information needed to deploy community prevention resources are the hallmarks of an effective and engaged public health system. Asthma registries that can tell public health experts about cases when they occur, the number of children with diagnosed asthma, and information about the care that children are receiving, represent essential tools in any significant effort to reduce and manage childhood asthma. The increased use of HIT provides the opportunity to simplify the broad adoption of registries. An additional critical role for public health is translating evidence into information regarding asthma's prevalence and impact in order to provide the evidence base for community-wide interventions aimed at reducing environmental risks such as emissions (including idling around schools), pesticide control, environmental tobacco smoke, and pest management for housing units.^{xliv} With nationwide adoption of such a registry system would come far better knowledge about the prevalence of asthma and the quality of treatment.

Figure 18: Key Components of Asthma Surveillance



Sources: Massachusetts and California State Asthma Action Plans

- **Reduction of asthma triggers in homes and communities.**

Because asthma can be initially triggered or re-triggered by many environmental factors, their removal from a child's home environment is essential (Figure 19). This means not only counseling families about triggers but actually helping them reduce or eliminate them through the use of special vacuums, air filtration, smoking cessation, special mattress covers, pest elimination (roach and rodent allergies are a major asthma trigger) and other home modifications. Seminal NIH-funded multi-site randomized controlled intervention research studies (NCICAS and ICAS studies) yielded important insight into the role of integrated pest management and other cleaning strategies to reduce triggers and control asthma symptoms in the home (Figure 19).

Figure 19: Environmental and Home Remediation^{xliv}

<ul style="list-style-type: none"> • Interventions tailored to individual child's skin prick results 	<ul style="list-style-type: none"> • Regular assessment of home environmental exposures (e.g., every six months for two years)
<ul style="list-style-type: none"> • Allergen-permeable covers for child's mattress, box spring, pillows 	<ul style="list-style-type: none"> • Routine evaluation of asthma-related complications (e.g., every two months for two years)
<ul style="list-style-type: none"> • HEPA air filters 	<ul style="list-style-type: none"> • Asthma education and management and directions on how to reduce environmental exposures to indoor allergens
<ul style="list-style-type: none"> • Vacuum with a HEPA air filter 	<ul style="list-style-type: none"> • Smoking cessation counseling

Sources: Morgan et al. 2004; Gergen et al. 1999; Greineder et al. 1999

Interventions in community locations used by children – playgrounds, schools and school-yards, and public housing projects – and the implementation of policies, such as those designed to reduce idling by buses around schools, have increasingly been shown to play a role in reducing asthma triggers. A growing body of evidence suggests that interventions designed to improve the

environments where children play and live can help decrease asthma morbidity.

Together — home and community interventions — have been shown to be effective at improving health, reducing illness, controlling trips to the hospital emergency department and inpatient admissions, reducing lost school and work days, and improving children's ability to engage in the normal activities of childhood.

A Case in Point: Addressing Asthma in Englewood

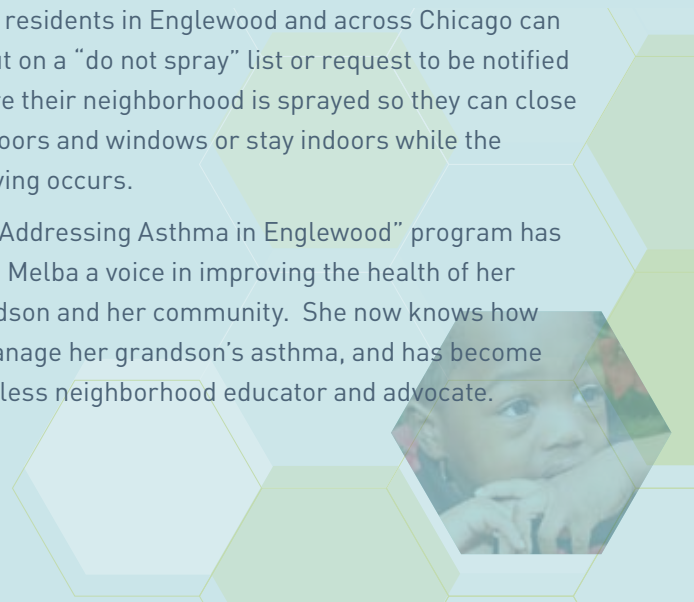
Asthma deaths in Illinois are the highest among African-Americans in the United States. Within Chicago, the Englewood neighborhood just south of downtown carries more than its share, with asthma-related hospitalizations that are double the city's average. When an entire community shoulders such a heavy burden of a chronic disease like asthma, solutions require more than individual action – it must be a collaborative effort.

The “Addressing Asthma in Englewood” program, funded by the Merck Childhood Asthma Network, Inc., is creating that kind of collaboration. Consider the story of Melba Miles, proud grandmother to 2-year-old Jamal who suffers from asthma. With an understanding that successfully managing asthma involves controlling indoor and outdoor triggers, part of the Englewood program includes a neighborhood advisory board that considers community-wide changes that can improve asthma control across Englewood. At one meeting of

the board's community leaders and caregivers, Melba expressed her concerns about the effects pesticide spraying was having on residents' asthma. The city's policy was to spray vacant lots in Chicago, the majority being in Englewood, without any warning to neighborhood residents. Melba reported that after nearby lots were sprayed, Jamal and others with asthma experienced breathing troubles.

Leaders on the “Addressing Asthma” board took action. Working with city officials, they created new spraying policies that would limit exposure to the pesticides. Now, residents in Englewood and across Chicago can be put on a “do not spray” list or request to be notified before their neighborhood is sprayed so they can close the doors and windows or stay indoors while the spraying occurs.

The “Addressing Asthma in Englewood” program has given Melba a voice in improving the health of her grandson and her community. She now knows how to manage her grandson's asthma, and has become a tireless neighborhood educator and advocate.



What We Know

EXAMPLES OF SUCCESSES & BEST PRACTICES

Important examples and important elements of what is working in asthma management and treatment can be found around the nation (Figures 20).

Figure 20. Asthma Best Practices^{xlv}

KEY COMPONENTS OF A SUCCESSFUL ASTHMA PROGRAM

Tailored Home Environment Remediation: Implementation of Inner-City Asthma Study (ICAS)*	
La Red de Asma Infantil de Merck de Puerto Rico (Puerto Rico Merck Childhood Asthma Network Program)	<ul style="list-style-type: none"> • A tailored environmental evidence-based intervention designed to reduce exposure to allergens in the home • Children skin tested for allergen sensitivities using the protocol from the original study as well as additional local allergens • Families receive three in-home education sessions on remediating exposure to common household allergens (dust mites, cockroaches) delivered by an environmental counselor or community health worker. • Education on remediation of allergens based on the child’s sensitivities is also provided, as well as supplies like HEPA filters and dust mite impermeable mattress covers.
Asthma Outcomes Among La Red Patients	<ul style="list-style-type: none"> • Since its inception the program has reduced asthma-related emergency department and hospitalizations by more than one half, from 93 percent to 35 percent for ED use and 27 percent to 9 percent for hospitalizations • Building on years of community-partnership and demonstrated success, the San Juan Department of Health is committed to sustaining the program in the pilot communities and extending it to other clinics in the city
Children’s Health Fund: Childhood Asthma Initiative (CAI) Family Asthma Guide**	
Asthma management guide to help families understand how asthma happens, what the triggers are, and how to control symptoms, including medication use:	<ul style="list-style-type: none"> • Provides families tips and guidance on proper medication use and suggestions for making the best use of doctor’s visits • Written in a way that is accessible to low-literacy families • Includes a sample written action plans families can complete and share with their doctors and schools to ensure they can control and manage their child’s asthma
Asthma Outcomes Among CAI Patients	<ul style="list-style-type: none"> • 75 percent of patients had persistent asthma symptoms at the time of initial assessment – at follow-up, incidence was reduced to 59 percent • Hospitalization decreased: 18 percent of asthma patients for the 12 months before initial assessment, down to 3 percent of patients prior to follow-up assessment • ED use declined from 53 percent of patients during the year prior to initial assessment to 20 percent of patients prior to follow-up assessment.

*Tailored Home Environment Remediation: Implementation of Inner-City Asthma Study (ICAS). Source: Lara M, et al. (2009)

**Children’s Health Fund: Childhood Asthma Initiative (CAI) Family Asthma Guide.

Source: More information found at: Children’s Health Fund www.childrenshealthfund.org and <http://www.childrenshealthfund.org/child-health-care/special-initiatives/childhood-asthma-initiative>

KEY COMPONENTS OF A SUCCESSFUL ASTHMA PROGRAM CONTINUED

Urban Health Plan's Comprehensive Asthma Management Project	
<p>The Urban Health Plan (UHP), a federally qualified health center in the South Bronx has worked with more than 6,400 patients to manage and control their asthma. The team - Dr. Acklema Mohammed, MD, an asthma coordinator, six health educators and a medical assistant – helps children and their families by:</p>	<ul style="list-style-type: none"> • Providing an initial evaluation of the patients asthma, followed by continuous monitoring • Creating an individualized asthma action plan for each patient • Educating the patient and caregiver about the disease and proper use of medication • Testing the patients for exhaled nitrous oxide, which helps to identify potentially uncontrolled asthma; allows the team to track patient adherence to the management plan • If necessary, referring the family to an integrated pest management service provided in partnership with the NYC Department of Health and Mental Hygiene
<p>Asthma Outcomes Among UHP Patients</p>	<ul style="list-style-type: none"> • The average patient had 11.1 symptom free days out of 14 • Anecdotally, patients report not having to use the emergency department for care and having a better understanding of asthma • Through UHP's participation in a NYC Department of Health and Mental Hygiene Project, "Business Case for Quality" the organization's program demonstrated significant savings for insurance plans among both pediatric and adult patients

Urban Health Plan's Comprehensive Asthma Management Project. Source: More information found at: Urban Health Plan, Inc. <http://www.urbanhealthplan.org/index.html>

Two Foundational Investments: Health Information Technology and Research

Underlying these investments are two important elements. The first is a health information system that encompasses health care, health care financing, and public health. The system should also build on proven techniques such as interoperable programs that are capable of rapid communication about the community-wide presence of asthma, critical incidents, and the reach of treatment into the affected population. Such technology could form the basis of a national system for estimating asthma presence. It also represents a key source of information for both applied and scientific research and offers a crucial tool for developing standards to control environmental threats and deploying resources into communities that experience elevated levels of asthma.

The HITECH amendments contained in the American Reinvestment and Recovery Act (ARRA) provide some \$49 billion in investments over a 10-year time period to enable providers to become meaningful users of HIT and to enable the adoption and use of interoperable systems that allow for the sharing of information across the spectrum of clinical care, engaged patients and improved population and public health. The ONCHIT is charged with setting national HIT

policy and with ensuring that these investments advance both clinical quality and population health, with a particular focus on conditions that greatly burden health and that produce significant disparities in health and health care.

- **Learning what works and increasing knowledge.**

The second important element is the strategic use of research to learn more about what works and to advance knowledge about the causes and effects of asthma. A well-developed research strategy to understand better and identify the epidemiology, pathophysiology, complicating factors and effective interventions represents an essential support. Ongoing research, including laboratory, clinical, and translational efforts aimed at preventing, treating, and managing asthma, is critical. The commitment to a robust childhood asthma research agenda includes coordinated efforts among research partners and funders, adequate and sustained funding, and the prioritization of meaningful data collection.

What We Know

Numerous federal agencies are involved in research and policy initiatives that address childhood asthma. Relevant research activities can be found within several major agencies of the Department of Health and Human Services (Figure 15, above), the Environmental Protection Agency, the Department of Housing and Urban Development, and the Department of Education. State and local public health agencies also play important roles in asthma research.

In 2000, the director of NHLBI, through the NAEPP Coordinating Committee, was required to identify all federal programs that carry out asthma-related activities, develop a federal plan for responding to asthma, and submit recommendations to Congress on ways to strengthen and improve coordination of these activities. However, the Coordinating Committee has not yet published a federal plan for asthma research and an agenda to implement this plan. In 2007, the NAEPP successfully issued the third update to the comprehensive guidelines for the diagnosis and management of asthma. At the same time, other federal agencies with an important pediatric asthma research portfolio, such as the Centers for Disease Control and Prevention and its Prevention Research Centers, have not made childhood asthma an explicit priority for their research programs.

The majority of asthma research in the United States is funded by the NIH, which expends about 55 percent of its resources on basic science and the remainder on clinical and applied research.^{xlvi} While the pathway(s) of translating basic science findings into refined methods of disease detection and successful treatment options have been increasingly supported, the strategies of implementing evidence-based interventions (EBI) into real world settings and routine practice have been less well funded and consequentially have lagged scientifically. The funding available to link science and service is relatively small.^{xlvii}

Despite the number of existing studies and projects investigating basic and clinical facets of asthma in general or pediatric asthma in particular, several key research questions remain unanswered. These include, but are not limited to, the role of viral and bacterial infections in early childhood; causes of acute episodes (e.g., distinct from those associated with chronic symptoms or simply an exaggeration of the factors involved in persistent asthma); characteristics of IgE antibodies that are associated with asthma (e.g., how does specificity and perhaps affinity of IgE antibodies influence the risk for asthma?); lifestyle changes including the rise

in obesity as they influenced the development of asthma. Given that there have been major changes in the lifestyle of children over the same period during which asthma has increased, have these changes influenced the prevalence of asthma, the severity of symptoms and lung function? Possible elements of lifestyle changes that may have influenced asthma include more indoor entertainment (television, computers, etc. leading to prolonged time sitting still), decreasing “play” outdoors, changes in diet with the associated rise in obesity, decreased sunlight leading to decreased production of Vitamin D, and interaction between the environment and genetic factors on the development of the disease.

The answers to these and other questions could be generated by different types of research depending on how the questions are framed, including basic science investigations, clinical randomized and observational studies, population-based evaluations, and health services research. Finally, improved management of childhood asthma faces the challenges of developing science-based methods and increased funding to implement innovations of EBI into routine practice in order to improve quality of care. Investments in these types of studies would require coordination among federal and state agencies that fund asthma-related research.



What We Recommend

What We Recommend

A CHILDHOOD ASTHMA POLICY ROADMAP: USING AVAILABLE TOOLS AND AIMING HIGHER


We have numerous tools for improving asthma treatment and management, while reducing the burden of asthma on children and families. But we need to aim higher through innovation in existing programs as well as through active coordination across the major federal agencies whose programs and strategies influence national asthma policy, particularly for the most at-risk children. The policy innovations launched today will lay important groundwork for broader transformations to come through comprehensive health reform.

Today's federal health programs offer specific policy levers that can be used to enable better performance for children with asthma. Numerous federal agencies play a crucial role in achieving a robust response to the great challenges posed by childhood asthma: The United States Department of Health and Human Services; the United States Environmental Protection Agency; and the United States Department of Education.

We present specific and feasible policy recommendations for each element identified as key to improving asthma outcomes:

Stable and Continuous Health Insurance

- Make Medicaid and CHIP enrollment a part of every eligible child's asthma treatment plan developed by the child's health care provider team. With approximately a half million eligible but unenrolled children with asthma and millions more currently enrolled in Medicaid or CHIP but at risk for breaks in coverage, Medicaid and CHIP enrollment should be viewed as part of the treatment plan for every low income child with asthma who otherwise is without health insurance.
- Encourage all states to expand Medicaid and CHIP at least to 300 percent of the federal policy level and to adopt new options to fully cover legally resident children. With expanded eligibility for coverage comes the potential for more stable and higher quality health care. Today seven states cover all children with family incomes up to 300 percent of the federal poverty level.^{xlviii} Expansion of public insurance to reach all eligible children nationally would represent an enormous advance and one consistent with broader health reform.
- Encourage all states to adopt Medicaid and CHIP enrollment and retention streamlining reforms, especially reforms aimed at making enrollment and retention activities possible through community health care providers, schools, and other locations where children and families can easily apply for and renew coverage. Outreach funding should be made available through Medicaid and CHIP, and community providers should partner with hospitals that furnish acute care to assure that no child is missed.
- Make enhanced asthma treatment and management a specific focus of quality performance improvement in Medicaid and CHIP. The 2009 CHIP legislation increases the focus on quality performance improvement among Medicaid and CHIP providers through the development



of national performance measures and alignment of these measures with provider payment incentives. Existing performance measures related to childhood asthma should be strengthened to more closely align with NHLBI/ NAEPP clinical treatment guidelines, particularly in the areas of health education and case management, and special quality demonstrations that utilize these measures to incentivize provider performance could be encouraged.

High quality clinical care, case management, and asthma education available for all children, including those who remain ineligible for insurance coverage

- Create an HHS-led, cross-agency, Administration-wide national plan for changing childhood asthma outcomes. Despite a wealth of programs and the importance of HHS programs to ensure accessible and quality care for children most at risk for asthma and its consequences, there is no current joint HHS guidance that comprehensively addresses childhood asthma, although HHS did issue a strategic plan on asthma in May 2000. The plan describes the role of the Department in pursuing priority public health actions to eliminate disparities and reduce the overall impact of asthma and addressing urgent needs for research in order to better understand the cause of the epidemic and develop preventive interventions to address these causes. The need for such leadership and guidance is particularly acute today in the case of programs overseen by CMS because of the role of Medicaid and CHIP in financing systemic improvements in pediatrics. The creation of such guidance could be led by a Secretarial-level work group consisting of CMS, the Health Resources and Services Administration, the Centers for Disease Control and Prevention, the Indian Health Service, the Office of the National Coordinator for Health Information Technology, and in collaboration with Departments of Education and Housing and Urban Development and the EPA.

Through a transparent process that involves consumers, health professionals, payers, and experts in public health practice, health information, health care financing, school health, community health, and clinical treatment for children with asthma, a Secretarial work group could develop comprehensive guidance. Such guidance could address the plethora of daily practical issues that arise when states and localities attempt to make better and more coordinated use of separate public programs in order to improve quality and efficiencies, reduce disparities in health and health outcomes, reduce public health threats, and improve overall population health. Practical guidance would greatly help translate the promise of public programs into real-world change. Such guidance could address with clarity:

1. The clinical services and treatments that Medicaid and CHIP will pay for and the treatment settings in which payment can be made;
2. Special financing opportunities in the case of community-based programs and health care providers that treat a disproportionate number of children with asthma and that are located in medically underserved rural and urban communities;
3. Options to finance outreach, health education, and case management in community settings;
4. Developing and using public health and practice registries related to childhood asthma and federal resources available for such activities;
5. Resources available for mitigating home and environmental threats;
6. The meaningful use of HIT in the context of pediatrics generally and childhood asthma in particular, because of the extent to which the quality of asthma care can benefit from improved health information exchange; and
7. Privacy and security considerations in adapting HIT to childhood asthma, which must cross clinical care, payers, educational systems, environmental practice, and public health practice.

What We Recommend

A far-reaching and visionary cross-agency initiative would do much in our view to encourage change at every level, while also attracting broad private sector participation because of the cost of childhood asthma to all payers.

- **Make performance improvement in childhood asthma a key aim of community health centers and the Indian Health Service.** Together health centers and the Indian Health Service (IHS) reach millions of the nation's children most at risk for asthma. Performance in pediatric asthma management and treatment should become a basic mechanism for measuring health care quality improvement in both programs.

The ability to continuously exchange information and monitor progress, using as much as possible opportunities presented by HIT.

- **Enhance asthma monitoring through model registries.** Asthma registries are essential to population surveillance, monitoring the accessibility and quality of care as well as patient outcomes, and tracking critical incidents. The Centers for Disease Control and Prevention, in collaboration with HRSA's Bureau of Maternal and Child Health and HHS' Assistant Secretaries for Health and Preparedness and Response, could develop special guidance on asthma registries that encourages the development and implementation of uniform registry systems in all states and communities with the capability of providing accurate data on prevalence, incident, and treatment by race, ethnicity, age and gender, and primary language spoken, so that over time, an accurate and current national and community picture of childhood asthma will emerge.

Reduction of asthma triggers in homes and the communities.

- Encourage public health agencies, housing authorities and environmental agencies to promote evidence-based interventions and services that are essential to reducing the many environmental asthma triggers that lie beyond the control of any one family and fall outside of traditional "health care" interventions.

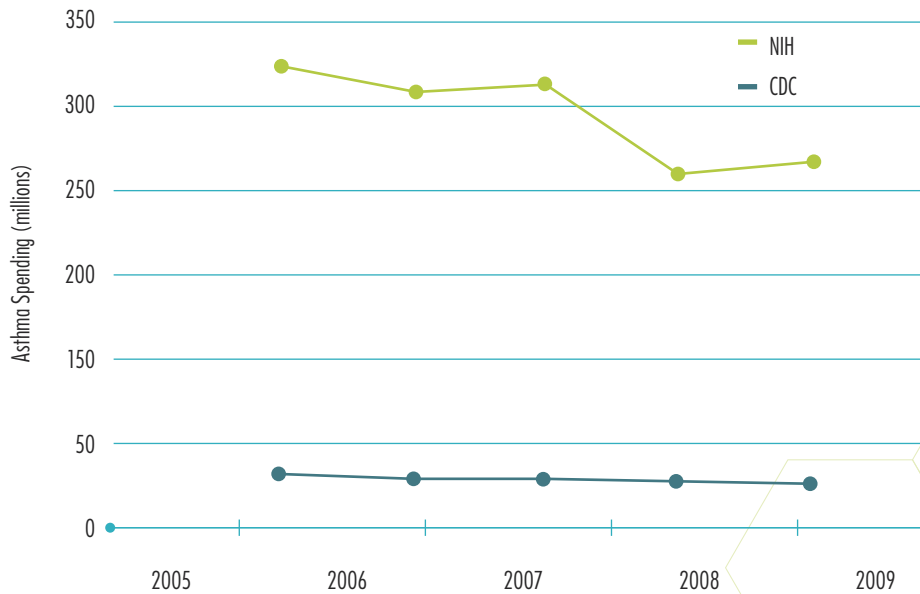
Learning what works and increasing knowledge.

- Promote a strengthened and diversified Administration-wide research agenda to include basic, clinical and translational/implementation investigations.

A far-reaching and visionary cross-agency initiative would do much in our view to encourage change at every level, while also attracting broad private sector participation...

Numerous federal agencies are involved in asthma research (Figure 15, above), but there is no coordinated, strategically thought out agenda that spans scientific and applied research and lays out a broader vision, beginning with what is known today, and focusing on what needs to be known in practice tomorrow, and where knowledge needs to go over the long term. Recent years have witnessed a shrinking research budget for asthma (Figure 21). While the overall NIH budget increased by 6.7 percent between 2005 and 2009 (from \$31.42 to \$32.32 billion in 2009 dollars), NIH funding for asthma research decreased by a real dollar decline of approximately 25 percent, from \$318.6 to \$252 million (in 2009 dollars). The CDC budget, which totals significantly less than the NIH budget, has fluctuated between 2005 and 2009 but has hovered at approximately \$9 billion (in 2009 dollars). From 2005 to 2009 CDC asthma funding has seen an overall decrease (\$35.8 to \$30.5 million in 2009 dollars). In addition, examples of duplicated and uncoordinated efforts abound with many equally notable lapses in strong and practical policy responses.^{xlix}

Figure 21: Federal Asthma Spending NIH and CDC (in 2009 dollars)



Note that the CDC figures may overstate investments in research since they include all asthma-related activities.
 Sources: NIH Research Portfolio Online Reporting Tool (RePORT). USDHHS. Accessed on July 16, 2009 [http://report.nih.gov/rcdc/categories/CDC Financial Management Office](http://report.nih.gov/rcdc/categories/CDC%20Financial%20Management%20Office).
 Budget Documents. <http://www.cdc.gov/fmo/fmafbybudget.htm> Accessed July 16, 2009.

What We Recommend

With the emerging consensus around the importance of comparative and clinical effectiveness research and in light of the 2009 reforms enacted by Congress to advance such research, it is time to fulfill the 2000 Congressional directive for a comprehensive asthma research agenda, bringing a fresh eye to the issue and coordinating the agenda to reach both research that advances daily practice and research that will deepen knowledge about asthma and its causes.

A robust asthma research agenda can be developed that builds on important research findings, and positive advances such as the publication of the NHLBI/ NAEPP guidelines and the NIH initiative to standardize outcome measures used in asthma-related research. However, in addition, adequate resources must be allocated to support the development of a coordinated research agenda and the implementation of the proposed agenda in the future.

- Expanded and sustained investment in basic science research is essential.

Asthma treatment and management will benefit enormously from the implementation of comparative clinical effectiveness research efforts that focus on the treatment and management of childhood asthma. Of particular importance will be well designed research that is capable of illuminating the beneficial effects for highest risk children of a comprehensive approach to childhood asthma treatment and management, with special emphasis on the effects of such an approach on health care costs, absenteeism at home and work, child health and development, and overall family functioning. Childhood asthma represents a strong case study of the extent to which clinical effectiveness research of the type envisioned under the American Reinvestment and Recovery Act (ARRA), which has already been used for investments in both basic and applied asthma research, can make a difference in the outcomes of high quality treatment for a chronic condition that can affect child health and development as well as family well-being. As the second highest source of pediatric health care spending, asthma represents a crucial area of focus for comparative effectiveness research. The thrust of comparative effectiveness research is to compare approaches to treating conditions and identify those strategies that promise both higher effectiveness and greater efficiencies. Enough is known about the effective management of asthma to warrant a high focus on comparative effectiveness research as a means of guiding clinical decision-making, structuring payment incentives, and advancing evidence-based public health approaches and investment.

These new efforts can be complemented by on-going and centralized tracking of past and current research investments (Figure 22) from the federal agencies involved in asthma research, and results inventoried by focus area and stratified by investments that are children-specific.

Figure 22: An Inventory of National Childhood Asthma Surveys

NATIONAL SURVEYS: CHILDHOOD ASTHMA DATA SOURCES

SURVEY INSTRUMENTS	DESCRIPTION	ASTHMA QUESTIONS	SPONSOR
Behavioral Risk Factor Surveillance System (BRFSS)	National, state-based, telephone health & health behavior survey for adults, data collected monthly (state level analysis)	2008 Questionnaire-optional state module about Childhood Asthma Prevalence (37 states & PR participated)	CDC
National Asthma Study (NAS)	One time survey for adults and children about asthma, national and four state data collected from 2003-2004 (limited state analysis)	Range of prevalence, health and health care experience questions for those with asthma	CDC
Healthcare Cost and Utilization Project (H-CUP)	Longitudinal health care and utilization databases, state to Federal level data, along with private data sources; ongoing data collection (state, patient-level analysis possible)	KIDS Inpatient Database about pediatric inpatient discharge, asthma associated hospital data (national analysis)	AHRQ
Medical Expenditure Panel Survey (MEPS)	Large scale database of surveys (individual and family data collection), nationally representative sub-sample (use NHIS sampling) for health care cost and use, accessibility, and health insurance coverage; ongoing data collection (local level analysis for insurance possible)	Asthma treatment and management (including medication) and related health care utilization questions	AHRQ
National Children's Study	Nationally representative sample using interviews, exams and samples to assess the effects of environmental influences on the health and development of children from 0-21, starting in 2010	Monitors potential causes of asthma (e.g. maternal health, environment, samples, interviews)	NICHD
National Health Interview Study (NHIS)	National cross-sectional household survey on the broad health of civilian U.S. residents, ongoing every year (national level analysis)	Range of asthma questions including prevalence, severity, and health care utilization	CDC
National Health and Nutrition Examination Survey (NHANES)	Nationally representative sample, on health and diet (interviews & physical exams), continuous interviews on emerging health needs; data collected every year (national level analysis)	Questions about asthma prevalence as a health condition	CDC
National Longitudinal Surveys (NLS)	NLSY79 Children and Young Adults Survey (biological children of women from NLS79 followed, asked health and life events questions, followed since 1986); data collected every two years (cohort specific analysis, not representative)	Health questions include asthma prevalence	DOL
National Survey for Children's Health (NSCH)	National representative telephone survey examining physical and emotional health of children (0-17); occurred in 2003-2004 and repeated 2007-2008 (state level analysis possible)	Range of asthma questions including prevalence, severity, and health care utilization	HRSA MCHB
National Survey of Children with Special Health Care Needs (SLAITS)	Nationally representative telephone survey assessing the prevalence and impact of special health care needs among children (0-17) and evaluating changes since 2001; occurred in 2005-2006	Monitors asthma prevalence and its effects on social activities	HRSA MCHB
Youth Behavioral Risk Surveillance System (YRBSS)	Nationally representative sample, school based health & health behavior survey for youth, conducted at national, state, territorial, tribal, local levels; data collected every two years (local level analysis possible)	Monitors asthma prevalence among youth	CDC

Sources: CDC Survey Questions. <http://www.cdc.gov/asthma/questions.htm> Accessed July 15, 2009; AHRQ Data. <http://www.ahrq.gov/data>. Accessed July 16, 2009.

A young boy with dark hair and a bright smile is flexing his right arm. He is wearing a white t-shirt with a Spider-Man graphic. The background shows a bookshelf with books and a framed photo of a child. The image has a soft, warm filter.

Concluding Thoughts

We know enough to act, and the nation has the resources in place to act now, regardless of what a reformed health care system will look like. A national commitment to high quality health care will spur progress for all children. At the same time, the tools exist today – the knowledge of what works, public and private health insurance that can enable strong and integrated health care systems, funding for improvements in the public health infrastructure, HIT adoption funding, and funds to grow high quality sources of primary health care, particularly for the nation’s highest risk children.



Methods-In-Brief

Methods-in-Brief

OVERVIEW

This report was designed to highlight the key issues around what is known and not yet known about childhood asthma. It also built on the existing knowledge to focus on how to implement strategies that are known to be effective in reducing asthma morbidity and advance the policy discussion around providing all children, especially those with asthma, with high quality and efficient health care. The report was assembled with the careful consideration of the existing evidence base for childhood asthma, including peer-reviewed journal articles, relevant policy reports, diverse nationally representative and robust data sets with validated measures to provide appropriate data with depth and breadth, in addition to in-person meetings and consultations with experts and guidance of an advisory committee of nationally recognized experts on child health, childhood asthma, and the insurance and health care landscape in the U.S.

Key Data Sources & Evidence

Expert Group Meetings

- GW-MCAN-RCHN CHF Childhood Asthma Policy Roundtable and Workshop, Grand Hyatt Washington, June 3, 2009, 8:00 AM–12 Noon
www.mcanonline.org/policy_issues/events.html

Nationally Representative Data Sources

- National Health Interview Survey (NHIS)
- Medical Expenditures Panel Survey (MEPS)
- Health Care Utilization Project (HCUP)
- National Survey for Children's Health (NSCH)

Peer-Reviewed Literature

- Recent, within 5-10 years, widely-cited and recognized as seminal in the field
- Most rigorous study design for interventions and research (e.g., randomized clinical interventions), including the Inner-City Asthma Study (ICAS) and the National Cooperative Inner-City Asthma Study (NCICAS)
- Categorized into domains relevant to childhood asthma including: biology, social environment, behavior, physical environment, policies, services, and clinical care

Key Policy Documents & Reports

- NAEPP: Expert Panel Report 3 Summary Report 2007: Guidelines for the Diagnosis and Management of Asthma and EPR-3: Full Report 2007
- American Lung Association: A National Asthma Public Policy Agenda, January 2009
- Public Health Foundation: We Can Do Better: Improving Asthma Outcomes in America, January 2009
- RAND Health: Improving Childhood Asthma Outcomes in the United States: A Blueprint for Policy Action, 2001
- Asthma UK: Where Next in Clinical Asthma Research? An Asthma UK Consultation on Clinical Asthma Research Strategy, 2004
- Action Against Asthma: A Strategic Plan for the Department of Health and Human Services, May 2000
- Putting the GIP Report in Motion: A Plan of Action for the National Asthma Control Initiative, April 2009
- President's Task Force on Environmental Health Risks and Safety Risks to Children. Asthma and the Environment: A Strategy to Protect Children. January 28, 1999 Revised May 2000

Special Technical Note about the Data Source & Methods Used for the GW 2006 MEPS Expenditure Analysis (Dor, A., Richard, P., and Tan, E., 2009)

GW used the 2006 Medical Expenditure Panel Survey (MEPS) to examine health care expenditures of children with asthma and determine health care expenditures of children conditional of having asthma. This analysis used the CDC definition of children ever diagnosed with asthma, which is different from the AHRQ definition used in the Kim et al. analysis of three years of MEPS data (Kim et al. (2009). Health Care Utilization by Children with Asthma, Preventing Chronic Disease Vo. 6: No. 1) which relates to direct medical expenditures for children who receive any asthma or COPD treatment in the past 12 months.

The 2006 MEPS is a set of large-scale family, individual, medical provider, and employer surveys across the United States. The MEPS is a nationally representative survey of health care use, insurance coverage, medical expenditures, sources of payment, demographic and socioeconomic variables for the U.S. civilian non-institutionalized population. The 2006 MEPS collects information from 34,145 individual respondents including 9,633 children below age 18 of which 1,022 were diagnosed with asthma. Within this sample, 796 children had persistent asthma during the past 12 months and 414 children experienced an asthma attack. Children are said to have persistent asthma if the child still had asthma or if the child had experienced an episode of asthma or an asthma attack in the past 12 months. Using the MEPS sampling weights, GW estimated that nationally 10.8 percent or a total of eight million children ages 0 to 17 have asthma.



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