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California Research Bureau 2002 Educational Tour Series

Policy Brief Number 3

Asthma Prevalence, Barriers to Effective Treatment, and Current Policy Recommendations for the State of California

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Introduction

PURPOSE

The purpose of this paper is to discuss the impact of asthma on the state of California and to review current policy recommendations. Asthma is the most common chronic disease in childhood and, at last estimate, 10.6 million people in the United States were thought to be suffering from this problem¹. California has higher rates of asthma than most other states. As costs for the treatment of asthma continue to increase, further strains are placed on California's health care system.

California differs from other states in four major areas that are thought to account for its high asthma rates. One reason is thought to be the environment or more specifically, poor air quality. Annually, greater than 90% of Californians breathe unhealthy air. The California Air Resources Board has identified a number of pollutants that negatively affect breathing, including particulate matter and ozone.² In the American Lung Association clean air test, which measures ozone pollution, California has had the worst air quality in the nation for the last three years.³ One of the major contributors to both particulate matter and ozone pollution is diesel exhaust. Diesel exhaust is a known contributor to lung cancer, bronchitis and asthma.³

Another reason that asthma has such an impact on California is thought to be that, since it disproportionately affects minority children, any state with a large number of such children will have more asthma. For California, this turns out to be true. California has a greater percentage of minority children than most states, and many live in poor air quality areas and also lack consistent health care.⁴

Access to health care is an important part of asthma management. California has a growing uninsured population which leads to increased emergency room visits and hospital stays that could be avoided with appropriate prevention and treatment. Lastly, California needs to implement better asthma screening guidelines and improve adherence by patients and physicians to current treatment guidelines. Research discussed in this paper will show that patients with uncontrolled asthma are usually not taking the correct medications.

The four major areas outlined above will be discussed in detail followed by policy recommendations to improve each one. In a time of growing health care costs, when more fiscal responsibility is being shifted to the states, the appropriate prevention and management of diseases such as asthma is crucial.

¹ "Measuring Childhood asthma prevalence..." MMWR Oct 13, 2000/ v49 i40;908-911.

² "California air quality data." California Air Resources Board, Jan. 7, 2003. www.arb.ca.gov

³ "34 California Counties Flunk Annual American Lung Association Clean Air Test." American Lung Association May 1, 2002. www.californialung.org

⁴ "Asthma: a concern for minority populations." NIH Fact Sheet, 2001. www.niaid.nih.gov

WHAT IS ASTHMA AND HOW IS IT TREATED?

Asthma is a chronic inflammatory disease of the lungs that is characterized by wheezing, cough, shortness of breath, and chest tightness. The symptoms are caused by airway inflammation and hyper-responsiveness (an exaggerated response to normal stimuli such as a dust particle) that lead to constriction and obstruction of the airways. Airways are big tunnels that carry air to the lungs. As the airways travel through the lungs, they become smaller, like branches of a tree. During an attack, muscles around the airways constrict (tighten), and less air passes in and out of the lungs (the hyper-responsiveness). Excess mucus forms in the airways clogging them even further (the inflammation). The attack, also called an episode or exacerbation, is what causes the symptoms of wheezing and difficulty breathing described above. Inflammation can be present even when a person does not have any symptoms. Many people think that, because they no longer have symptoms, they do not have asthma; but this is not true. There is no cure for asthma, although a person can go for many years without any symptoms.

The cause for asthma is unknown, yet studies have determined risk factors for asthma to include genetic predisposition, environmental triggers such as indoor pollutants (dust mites, mold spores, animal dander, cockroaches, cleaning agents, wood burning stoves) as well as outdoor pollutants (pollen, diesel exhaust, irritants). Asthma attacks are caused by “triggers” or factors that cause the inflammation and decreased air flow described above. Common asthma triggers that can be partially avoided are cold air, dust, pollen, mold, and other environmental irritants. Use of protective covers on bedding, removal of carpets, keeping pets out of sleeping areas and removing standing water in the house can decrease mold, animal dander, and pollens. Other triggers that can be prevented are allergies, exercise, viruses, and air particles. Allergies can be controlled with medication which will decrease the likelihood of an asthma attack. Appropriate use of asthma medication can also make exercise possible and enjoyable again. Air particles are difficult to avoid. Obviously, improved air quality is necessary. However, avoiding exercise during poor air quality times can help. Controlling colds with medications can also decrease the frequency of attacks. Smoking is another trigger that usually can be avoided. Unfortunately, a common cause of exacerbations for children with asthma is an adult who smokes in the home.

Asthma is difficult to diagnose because many other diseases have the same symptoms. To establish the diagnosis of asthma, it must be determined that (1) episodic symptoms of airflow obstruction are present, (2) airflow obstruction is at least partially reversible, and (3) alternative diagnoses are excluded.⁵ In other words, the airways become smaller and then can open up again. A diagnosis is determined by the history of the patient, physical exam, and spirometry. Spirometry is an objective measure used to calculate the flow of air through the lungs. The patient simply blows air through the machine and the physician interprets the results. Once the diagnosis of asthma is made, the disease is categorized as follows. The four categories for asthma are: Mild Intermittent, Mild Persistent, Moderate Persistent and Severe Persistent.

- Mild Intermittent asthma is defined as daytime symptoms less than two times a week, rarely at night, with brief exacerbations.

⁵ “Guidelines for the Diagnosis and Management of Asthma,” National Institutes of Health Publication No. 97-4051, July 1997.

- Mild Persistent asthma is defined as symptoms more than twice a week, but less than once a day. Exacerbations can affect activity and night symptoms can occur more than twice a month.
- Moderate Persistent asthma is defined as daily symptoms with exacerbations more than twice a week that affect activity and can last for days. Night symptoms are more than one a week.
- Severe Persistent asthma is defined as continual symptoms, limited physical activity, and frequent day and night exacerbations.

Each of these categories also has a corresponding objective result on spirometry that can help in categorization. Correct categorization of each patient is crucial to appropriate treatment.

Treatment of asthma is in response to the severity of symptoms. First line treatment for asthma consists of short- and long-acting bronchodilators (albuterol) that relax bronchial smooth muscle and open up airways but do not affect the underlying disease. Oral steroid inhalers are used for more persistent asthma and have an anti-inflammatory effect to gain control and speed recovery of exacerbations. They also reduce bronchial hyper-responsiveness and modify disease progression. More recent studies indicate that early use of inhaled steroids in children actually slows progression of disease and would decrease morbidity and mortality. Other medications used to treat asthma include Cromolyn Sodium, Nedocromil, Anticholinergics (Atrovent), Antileukotrienes, and Theophylline. These medications are used when the first two - bronchodilators and steroids - have not adequately controlled symptoms.

ASTHMA IN THE U. S.

Asthma continues to burden the health care system. Despite new treatment guidelines and policy recommendations, the problem is getting worse for children and minorities. Among the general population it remains the same. Some alarming statistics:

- In 1998, 13.9 million clinic and 2 million emergency room visits were for asthma. (1)
- Asthma continues to have a greater impact on the nation's youth and is the third highest cause of hospitalization in children aged 15 and younger. (2)
- In the last 20 years, there was no significant improvement in school absence days or activity limitation due to asthma. (2)
- Emergency room visits related to asthma have increased by 33%. (3)
- There is a continued racial disparity in asthma mortality and morbidity that although documented, has not been addressed. African Americans continue to have higher rates of emergency room visits, hospitalizations and deaths due to asthma than do Caucasians. (4)

In summary, despite available treatment and intervention programs, asthma continues to adversely impact the nation's health care system.

Asthma Prevalence

NATIONAL ASTHMA PREVALENCE IS INCREASING

Asthma prevalence is defined as the number of people who have been told by a doctor that they have asthma. In 1998, approximately 10.6 million people in the United States had experienced an asthma episode in the past 12 months. Of the 10.6 million people, 6.8 million were adults and 3.8 million were children. African Americans had the highest prevalence (50/1,000 population) followed by Caucasians (39/1,000), and finally Latinos (36/1,000).⁶ The way asthma is measured nationally in the United States changed in 1997. Therefore, it is difficult to compare studies done on prevalence of the disease before 1997 to those done after 1997. Nevertheless, researchers have adjusted the data and still found an increase in prevalence in asthma over the past decades. Nationally, during 1997-1999, the rates of lifetime reported asthma were higher than previously reported.⁷ This is a disturbing trend. More people are being diagnosed with asthma and we do not know why.

ASTHMA IN CALIFORNIA

In the State of California, the direct and indirect cost of asthma continues to increase. In 1998, the estimated total cost of asthma was 1.266 billion dollars.⁸ Two studies that have recently looked at the prevalence of asthma in California shed some light on why the costs are so high.

The 2000 Behavioral Risk Factor Surveillance System⁹ (BRFSS) was the first national effort to collect state-specific data. It is a telephone survey conducted by the Centers for Disease Control and Prevention that looks at personal health behaviors in the United States. In this survey, two questions were asked to assess lifetime and current asthma. It is important to understand the difference between these two types of asthma and how they affect resources. If you only ask people if they currently have asthma, this may not be a representative number since you will miss the large number of people who have asthma for only part of their life. For example, it is very common for people to say they had asthma as a child but do not as an adult. Although asthma is not curable, it can become so mild that the person no longer experiences any symptoms. Lifetime asthma gives a better estimate of how many people have been affected by the disease at any point in their life. It is also a better estimate of the resources needed to address the problem. A higher rate of lifetime asthma will lead to higher medical costs. To find out about asthma in different states, the BRFSS asked the following two questions:

1. "Have you ever been told by a doctor that you have asthma"? (Lifetime Asthma)
2. If "Yes", "Do you still have asthma?" (Current Asthma)

⁶ National Center for Health Statistics, U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. October 5, 2001.

⁷ "Surveillance for Asthma-United States, 1980-1999." MMWR March 29, 2002 / 51(SS01); 1-13.

⁸ Asthma and Allergy Foundation of America: Trends in the Cost of Asthma in the United States. www.aafa.org

⁹ Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2000.

The results of this study showed California had a greater lifetime rate of asthma than the median rate for all other states. Lifetime asthma prevalence was 11.5% in the State of California with the median rate of lifetime asthma for all states being 10.5%. The estimated current asthma prevalence for the State of California in the year 2000 was 7.3%. This was a total of 3,898,000 persons or 5.6% of men and 9.0% of women. The median rate of current asthma for all states was also 7.3%. This greater lifetime rate of asthma in California is one reason why costs are so high.

The California Health Interview Survey (CHIS),¹⁰ also conducted by telephone in 2001, found similar results. Lifetime prevalence for asthma was estimated to be 11.9% for California, compared with a national average of 10.1% (see table below). Another interesting finding was that more than 300,000 Californians visited emergency rooms during 2000 due to their asthma. Emergency room visits add tremendous cost, especially when they can be avoided by better disease management. Moreover, the CHIS found that 14.9% of adults and 18.2% of children in California who reported daily or weekly symptoms were not currently taking any medication. Asthmatics who have daily or weekly symptoms should be using medication. Uncontrolled asthma causes an increase in emergency room visits, an increase in missed school/work days, and a limitation of physical activity. This lack of exercise leads to another problem since it has been linked to one of the causes of the increased prevalence of childhood obesity.¹¹ Obesity is a risk factor for heart disease, the number one cause of mortality. Several recent studies have documented the association between asthma and obesity.¹² However, at this time a direct causation has not been proved. What is clear is the high association between these two conditions and the impact they have on morbidity and mortality in the United States.

Survey	Current Asthma Prevalence		Lifetime Asthma Prevalence		Emergency Room visits
	CA	U.S.	CA	U.S.	
2000 Behavioral Risk Factor Surveillance System	7.3%	7.3%	11.5%	10.1%	Not applicable
2001 California Health Interview Survey	Not Applicable		CA 11.9%		300,000 in 2000

The results of these two studies show that asthma is a continuing problem in the state of California. It is unclear why asthma has become more common over the past decades. Factors often blamed for this increase include environmental pollutants, the change in the ozone layer, chemicals, and global temperature differences that have changed plants and pollens. Despite the

¹⁰ ER Brown, YY Meng, SH Babey, and E Malcolm. Asthma in California, 2001: High Rates Affect Most Population Groups. Los Angeles: California Health Interview Survey Policy Brief, UCLA Center for Health Policy Research, May 2002.

¹¹ "Prevalence and Trends in Overweight Among U.S. Children and Adolescents, 1999-2000." JAMA, Oct. 9/02, Vol.288, No.14.

¹² M Rodriguez. "Identification of Population Subgroups of Children and Adolescents with High Asthma Prevalence," Archives of Pediatric and Adolescent Medicine, 2002; 156:269-275.

unknown cause, most agree that the majority of the morbidity and mortality due to asthma can be prevented through patient education, patient adherence, and appropriate medical management.

ASTHMA IN SPECIFIC POPULATIONS

To further understand the impact of asthma on Californians, it is important to understand how asthma affects specific populations. It is well documented that asthma disproportionately affects minority populations:

- Nationally, asthma is 26% more prevalent in African American than Caucasian children. (9)
- African American children are three times as likely as Caucasian children to be hospitalized from asthma and three times more likely to die from the disease. (6)
- In California, among persons who reported having asthma, 15.5% of American Indian and Alaska Natives, 12.9% of Latinos, and 12.1% of African Americans reported emergency room visits compared to 7.9% of Asians and 6.4% of Whites. (8)
- Over half a million Latinos in California suffer from asthma including approximately 200,000 children. (10) Latinos currently make up approximately 40% of the state's children, and this population is rapidly growing.

Factors thought to be responsible for the above stated disproportionate burden of disease include geographic distribution, with most minorities living in urban and rural areas with poor air quality, possible genetic predisposition in African Americans, lack of culturally and linguistically appropriate asthma education programs, and limited access to medical care.¹³ The potential increased impact of asthma on the State of California from this expanding population (children and minorities) is huge.

¹³ "Confronting Asthma in California's Latino Communities." Latino Issues Forum, April 1999. www.lif.org/publications/asthma_rpt1.pdf

Barriers To Effective Treatment of Asthma

With a significant knowledge base, effective medications, and excellent practice guidelines, one might expect that most people with asthma would have their condition well controlled with only sporadic, mild exacerbations. To maintain good control, people with asthma would only need to access a health care provider and follow their recommendations. Unfortunately, there is a series of problems that keep California's asthmatics from achieving and maintaining good control. These problems, or recognized barriers to effective treatment of asthma, can be divided into four general problem areas:

LACK OF ACCESS TO APPROPRIATE MEDICAL CARE

Often, the most vulnerable populations do not receive ongoing, preventive care due, in large part, to a lack of health care coverage. Even for those who do have health insurance, there are also factors such as long waiting time for appointments, lack of transportation, lack of high-quality asthma care, and shortages of staff who can communicate with them in their language and in a culturally sensitive fashion.

LACK OF IMPLEMENTATION OF RECOMMENDED ASTHMA TREATMENT GUIDELINES BY HEALTH PLANS AND PROVIDERS

Nationally recognized guidelines for the treatment of asthma have been widely promoted by the National Institutes of Health since 1997.¹⁴ In spite of this, most health plans and providers of health services have not yet fully implemented the guidelines in their practices. The reasons for this are multiple and complex, but the most salient are:

- Improper diagnosis of asthma, particularly early in its course;
- Limited time in the clinician's offices for asthma education;
- Lack of awareness of the existence of the clinical guidelines;
- Lack of appreciation of the severity of asthma by both the patients and the providers; and,
- Under-management and delays in treatment of patients with asthma.

LACK OF ADHERENCE TO PROVIDER RECOMMENDATIONS BY THE PATIENTS AND THEIR FAMILIES DUE TO:

- Multiple medications with frequent dosing;
- Difficult route of administration (inhalers);
- Side effects of medications (hyperactivity, dry mouth, thrush and rapid heart rate);
- Cost due to machinery, medications and doctor's visits; and,
- Inadequate environmental controls in the home.

PSYCHOSOCIAL AND SOCIOECONOMIC FACTORS:

- Low income causing inability to buy medicine, equipment;

¹⁴ "Guidelines for the Diagnosis and Management of Asthma," Ibid.

- Lack of resources such as child care causing a sick child to go to school;
- Inability to reduce triggers in the home due to financial constraints;
- Low self esteem causing lack of motivation in disease management; and,
- Poor coping mechanisms leading to poor adherence to treatment regimen.

As long as there are significant psychosocial and socioeconomic factors present in a family, it is unlikely that asthma management will be a priority. A corollary to this is that asthma treatment programs that do not address the more pressing social and economic needs of the families where asthma is present are more likely to report higher asthma exacerbation recurrence rates.

ENVIRONMENTAL FACTORS

Changing the physical environment can decrease prevalence, morbidity, and mortality of asthma, especially among children. Children are at greater risk from pollutants because of developing respiratory systems and breathing in more toxins than adults in proportion to their body weight.¹⁵ Elevated outdoor allergens such as ozone, exhaust, and pollen are common culprits. Indoor allergens, including tobacco smoke, cockroaches, dust mites, mold spores, and animal dander, are also a problem.

While children are at greatest risk from air and home pollutants, adults are usually more affected by their work environment. Work-related asthma involves the same irritants/pollutants as mentioned above. There are two main types. The first is asthma that is aggravated by work in persons with previously diagnosed asthma. The second type is asthma-like symptoms, called Reactive Airway Dysfunction Syndrome, caused by occupational exposures. The symptoms and treatment for the two are identical. Work-related asthma accounts for 10% of all cases of adult asthma.¹⁶ Irritant substances such as paint fumes, chlorine gas, diesel exhaust, bleaching agents, hydrochloric acid, zinc chloride, and sulfuric acid are common causes of work related asthma. Allergenic substances such as latex are also a problem. Reducing or eliminating exposure to these compounds is critical to reducing asthmatic exacerbations and decreased work productivity.

¹⁵ R McConnell, et al. "Asthma in Exercising Children Exposed to Ozone: A Cohort Study." *Lancet* 2002; 359:386-391.

¹⁶ National Asthma Education and Prevention Program Expert Panel Report. "Guidelines for the diagnosis and management of Asthma update 2002." www.NIH.org

Current Published Recommendations

Over the past two years, a number of documents have been published both nationally and in California that examine the problems related to asthma. The CDC's National Asthma Control Program is currently funding programs in several states, including three intervention activities in the State of California that look at treatment, prevention of asthma mortality, and tracking activities in the California Department of Health Services.

The CDC also supports the Americans Breathing Easier Program, a school program that focuses on interventions to reduce attacks and subsequent absences. The current strategy used by the CDC has six components. Noticeably missing is a cultural component to tailor the national program to each school's community. Other programs include the National Asthma Education and Prevention Program created by the National Heart, Lung and Blood Institute and the Department of Health and Human Services' Action Against Asthma.

In a review of the current literature, the following publications (See Appendix I for full citations) were found to have thorough, concise policy recommendations for asthma:

- **“Improving Childhood Asthma Outcomes in the United States: A Blueprint for Policy Action”** by Marielena Lara et al., RAND Health series (RAND), 2001.
- **“Improving Quality of Care for Californians with Pediatric Asthma”** by the California HealthCare Foundation (CHCF), July 2002.
- **“Healthy People 2010”** Office of Disease Prevention and Health Promotion (HP), U.S. Department of Health and Human Services, 2001.
- **“Asthma in California in 2001: High Rates Affect Most Population Groups”** California Health Interview Survey (CHIS), Policy Brief, May 2002.
- **“Taking Action: Confronting the Health, Social and Environmental Factors Associated with Asthma in the Latino Community”** Latino Issues Forum (LIF), January 2002.
- **“Strategies for Addressing Asthma Within a Coordinated School Health Program”** Centers for Disease Control and Prevention (CDC), U.S. Department of Health and Human Services, 2002.

Each one of these organizations is different in its scope and target populations, and they approach asthma from a unique perspective. For the purpose of this review, we have grouped and analyzed the recommendations for the different organizations. Collectively, the recommendations pronounced by these organizations represent the up-to-date opinions of literally hundreds of experts in the field of asthma management and related topics. Overall, the organizations are in remarkable agreement with one another; however, some differences remain and will be discussed here.

The following recommendations were grouped according to topic and labeled with links to the research studies cited above. The outline follows the four problem areas described earlier that prevent adequate disease control. For a detailed description of the organization of these recommendations, please see Appendix II.

Summary of Asthma Recommendations

I. RECOMMENDATIONS REGARDING THE IMPROVEMENT OF HEALTH CARE DELIVERY

A. Access to Care

- Health care services for people with asthma should be *universal* (RAND, LIF) and *comprehensive* in nature (CHIS). Services should include follow-up medical care after any hospitalization. (HP)
- All uninsured should either receive insurance (RAND) or have their medications sold to them utilizing a “sliding fee” scale. (LIF)
- Ethnically and linguistically appropriate community health promoters (“promotoras”) should be incorporated into the provision of services within the Department of Health Services (LIF) in areas with a predominantly Latino population.

B. Implementation of Guidelines by Health-plans and Providers

1. Health-plan and provider education

- A *model benefits package* for people with asthma needs to be developed (RAND). A set of basic benefits for all children with asthma would help ensure that all private and public health insurance plans cover all services (for example, age-appropriate emergency and preventive medications and an adequate number of initial and follow-up visits with a physician) essential for the proper treatment of persons with asthma.
- Health care organizations and providers should incorporate strategies to reduce activity limitations in persons with asthma (HP) such as encouraging proper warm-up and use of quick-relief medications prior to exercise when it is medically appropriate.
- Formal patient and family education programs need to be developed regarding environmental triggers (HP, CHIS), proper use of inhalers (HP), early signs and symptoms of asthma, and the proper use of *Peak Flow Meters* (HP).
- The providers should be instructed in the generation of written *Asthma Action Plans* that detail indicators and steps to take during times when the patients are breathing well and during asthma flare-ups. Copies should be given to the patients, their families, and to the patients’ schools.

- Emphasis is placed on asthma treatment being part of *comprehensive* medical care (CHIS) as asthma occurs in the context of other individual and family health care needs, many which have to be addressed concurrently (if not first) in order to allow for treatment of asthma.

2. Health-plan and provider monitoring and evaluation

- The use of criteria to evaluate how a doctor manages an asthmatic patient or “*primary care performance measurements*” is promoted in the RAND document to address the “...substantial gap between best practices for asthma care and the care delivered in the primary care setting.”
- A “*toolkit*” which would include a guide to evaluate if providers are using medications appropriately is promoted by the CHCF.
- HP recommends a *surveillance system* that would, in part, track asthma management, and the LIF recommends the adoption of standards “...for the diagnosis and treatment of asthma.”
- The HP document describes specific *asthma care indicators* that could be monitored (for example, the percent of asthma patients with formal education regarding asthma management, percent of patients with written Asthma Action Plans, percent of patients instructed in the correct use of inhalers, peak flow meter use, knowledge of early signs and symptoms of asthma, and decreased exposure to environmental risk factors at home).

All these measures are to be implemented statewide and across all public and private provider entities.

C. Patient Adherence to Preventive Measures and Treatment Prescriptions

- Persons with asthma and their family members should receive asthma education. (RAND, HP, CHIS)
- Asthma Case Management should be implemented, “...a comprehensive set of services ...that include tracking, coordinated care, and follow-up (for) high risk children.” (see RAND, p. vi)
- Asthma public education campaigns are recommended (RAND, LIF). Also recommended is the use of promotoras, or community health promoters, as culturally appropriate and effective outreach agents in Latino communities. (LIF, p. 30)

D. Psychosocial and Socioeconomic Factors

The LIF document specifically calls for affordable housing and regulation for owners of rental units to change the carpeting every two years as a measure to decrease exposure to environmental triggers for low-income families (LIF, p. 31). Psychosocial issues are further addressed in Section III: Recommendations Regarding the School System.

II. RECOMMENDATIONS REGARDING THE STRENGTHENING OF PUBLIC/PRIVATE HEALTH INFRASTRUCTURE

A. Asthma Surveillance System and Identification of “Pockets Of Need”

Five of the six groups refer to the need for a national or statewide surveillance system or “registry.” A surveillance system would allow for both the identification of areas with particularly high prevalence rates of asthma (“pockets of need,” RAND, CHCF) and for the measurement of the impact of targeted interventions. (CHIS, HP, LIF)

B. Asthma Collaborative/Advisory Group

CHCF specifically recommends the development of a “...structured collaborative of providers assigned to improve the care of the chronically ill in California” and the establishment of an “advisory group to identify high leverage areas for interventions.” (CHCF, pp. 25-26)

C. Coordination with Private Corporations

- The RAND document specifically recommends that health care purchasers, which include many small as well as large employers, become educated about asthma benefits, noting that “...they have the opportunity, through the contracting process, to change benefits or to incorporate performance measures...that encourage the provision of quality asthma care.” (RAND, p. ix)
- LIF addresses the need to coordinate with employers to reduce exposure to environmental risk factors in the work environment, and CHIS and LIF both address the need for decreasing air pollution, LIF specifically promoting the coordination between local air districts and local industries to achieve air quality.

D. Funding of Organizations

The RAND document recommends that public health grants be made available “...to foster asthma-friendly communities and home environments.” (RAND, pp. x-xi) Asthma friendly communities are characterized by the presence of health care, schools, and social

agencies that respond to the needs of asthma patients and the absence of environmental factors that exacerbate their condition. LIF promotes the funding of "...programs and organizations that are addressing the social and environmental factors associated with asthma in low-income and communities of color;" LIF also recommends the increase of funding for "...asthma programs that use promotoras or community health promoters." (LIF, pp. 17-18, 30)

E. Air Quality

LIF, in addition to promoting increased participation of industry in improving and maintaining air quality, is promoting both the "...increased involvement of health care providers and advocates in environmental health," to "...educate and involve community members on governance issues in order to increase civic participation around air quality issues," and that "...the EPA must monitor and enforce local air district plans to meet attainment standards for both ozone and particulate matter." (LIF, pp. 32-33)

III. RECOMMENDATIONS REGARDING THE SCHOOL SYSTEM

The overriding goal of the different recommendations regarding asthma and the school system is the promotion of "asthma-friendly" schools, a concept which includes supportive administrative policies in relation to the treatment and education of children with asthma and their families, teacher education (with particular emphasis on physical education instructors), and the air quality within the classrooms and surrounding the schools. The topic of asthma screening, which encompasses administration, teachers, and air quality issues, will be addressed in Section III D.

A. Medication/Treatment and Asthma Education Policies

One of the main problems which students with asthma, their teachers, and school administrative personnel have to face is the issue of the use of asthma medications within the school premises during and after school hours. Section 49423 of the California Education Code allows school nurses or other designated school personnel to assist a student who is required to take prescribed medication during the school day providing that there are written instructions from the physician regarding the use of the medication and a written statement from the parent requesting such assistance. The law does not address how the school should ensure that the child has immediate access to medications such as asthma inhalers; for example, where they are to be stored or whether the child may keep them in their possession during the school day. It also does not address the need for the school to be provided with instructions as to what to do in the event of an exacerbation of the child's asthma.

- As the goal is to ensure that students' asthma is well managed at school, both RAND and CDC recommend the development of policies and procedures regarding asthma treatment (RAND, p. xi, and CDC, p. 2). The CDC document specifically recommends that schools ensure that "...at all times students have immediate access to medications,

as prescribed by a physician and approved by parents. Specific options, such as allowing students to self-carry and self-administer medications, should be determined on a case-by-case basis with input from the physician, parent, and school.” (CDC, p.3)

- In-school treatment with asthma medications requires that the school have a written treatment plan for each student with asthma. Both the CDC and the HP 2010 documents recommend that people with asthma have a written asthma action plan (or asthma management plan), written by the patient’s primary care physician, with a copy for the school administration.
- In addition to asthma treatment, both the RAND and the CDC documents address the need for asthma education for the students with asthma, not limited to but including self-management techniques. (RAND, p. xi and CDC, p. 3)
- The CDC report recommends that schools “...provide a full-time registered nurse all day, every day for each school,” “...ensure access to a consulting physician for each school”, “...provide and coordinate school-based counseling, psychological, and social services for students with asthma...” and “...refer students without a primary care provider to child health insurance programs and providers.” (CDC, p.3)

For many schools, the above may appear to be a lofty, unrealistic goal, particularly if viewed only from the perspective of asthma treatment. However, from a societal perspective, the future of our country’s overall health may very well rest in the provision of primary health care services to the school-age population. If we look at the main causes of the diseases that cause most of the illness and death in America (early cardiovascular disease, alcoholism, depression, drug abuse/dependence), the programs designed to address these problems that have been shown to be most effective all target the late-elementary and middle school level population.¹⁷ Even with respect to the treatment of asthma, it is beneficial that all children with asthma be followed by a primary care provider as there are a number of conditions which frequently occur together with asthma (“co-morbidities” such as gastro-esophageal reflux, allergies, obesity, and family dysfunction¹⁸) which are better addressed as part of an overall primary health care approach versus a categorical “asthma treatment program.”

B. Teacher Education

Both the CDC and the LIF documents recommend that school staff receive asthma education and awareness programs, yet RAND, CDC and HP documents specifically address the need to increase (or at least maintain) the amount of physical activity of children with asthma. As children with asthma may frequently cough or experience other symptoms with exercise, parents and even physical education instructors are frequently

¹⁷ “The Burden of Disease in Los Angeles County: A study of the patterns of morbidity and mortality in the county population.” LAC DHS and UCLA Center for Health Policy Research, Jan 2000.

¹⁸ MS Blaiss. Symposium: Co-morbid Conditions in Pediatric and Adult Patients with Asthma. Program and abstracts of the 58th Annual Meeting of the American Academy of Allergy, Asthma and Immunology, Mar.1-6, 2002, N.Y, N.Y.

reticent to encourage them to participate in normal physical activities. This has recently been exacerbated among physical education instructors in California because of the death last year from asthma of a student during physical education class in northern California.¹⁹

There remains, however, ample reason to encourage as-normal-as-possible physical activity levels in children with asthma. A regular physical exercise program actually decreases the number and severity of exacerbations of asthma; in addition there are now medication regimens that allow most children with asthma participation in nearly all sports activities.^{20 21} The RAND document recommends "...evaluation of children's ability to participate in physical education as well as support them to do so" (RAND, p. x) and the CDC document recommends that schools "...provide safe, enjoyable physical education and activity opportunities for students with asthma." (CDC, p.4) Neither document addresses how the children's ability to participate in physical activity should be determined, yet both the asthma action plan and asthma screening could assist in this issue (see Section D: Asthma Screening).

C. Indoor Air Quality

All six documents address the issue of appropriate indoor air quality by reducing known allergen and irritant exposure. In addition, the LIF recommends that "...the Department of Education...create policies on the use and proliferation of bungalows or portable classrooms" as there is concern as to the potential indoor air quality problems in portable classrooms. (LIF, pp. 19-20, 31)

D. Asthma Screening

The issue as to whether to "screen for asthma" in schools is complex and requires a clear understanding of what is meant by "screening" and how to interpret and act upon the results of the screening effort. The CDC document is the only one of the six reviewed which mentions screening, stating that schools should "...avoid mass screening and mass case detection *as methods for routine identification.*" (CDC, p.2) The American College of Asthma, Allergy and Immunology's promotion of exercise-based screening on a national level and the State of Connecticut's recent ruling that all school-aged children must be screened for asthma attest to the degree of controversy that exists regarding screening for asthma.^{22 23} In addition, recent evidence supports the theory that airway remodeling and

¹⁹ As per conversations with Physical Education instructors at Sun Valley Middle School, Sun Valley, CA, summer/2002.

²⁰ H Milgrom and L Taussig, "Keeping Children With Exercise-induced Asthma Active." PEDIATRICS, Vol. 104, No.3, September 1999.

²¹ "Guidelines for the Diagnosis and Management of Asthma." Ibid.

²² "American College of Allergy, Asthma and Immunology: The Free Running Athletic Screening Test." Annals of Allergy, Asthma and Immunology, Vol.81, October 1998.

²³ State of Connecticut Screening Bill, enacted 7/23/2001, requires CT Board of Education to mandate each child to have a health assessment prior to public school enrollment. The assessment will include asthma diagnosis, requiring the school board to establish a program for the early identification and treatment of pediatric asthma as well as a monitoring program.

possibly fixed asthma may result from failure to treat asthma airway inflammation, thus emphasizing the importance of the early identification of patients with likely asthma.²⁴

Essential to understanding “screening for asthma” is that *there is no single diagnostic test for asthma*. Asthma is a diagnosis which requires considerable history-taking and physical testing, possibly under different conditions or even seasons of the year for a particular patient, to make this diagnosis. As such, “screening tests for asthma” that have been developed can be divided into (1) *questionnaires* which may indicate whether a patient’s history is possibly consistent with asthma, and (2) physical tests, commonly either measurements of *expiratory peak flow* or *spirometry*, with and without a “challenge,” which may reveal results consistent with asthma (as well as in other conditions). Both methods of screening have their strengths and limitations. Screening by either method, or even in combination,²⁵ will not be sufficient to make the diagnosis of asthma in most previously undiagnosed asthmatics, yet it will allow for the identification of the children who should be referred for further evaluation by the patient’s primary care provider to rule out the presence of asthma.

The purpose of screening for asthma is to eventually detect those people with undiagnosed asthma. Numerous studies have confirmed the existence of a significant number of persons with undiagnosed asthma, at times equal to or even far exceeding the number of children with diagnosed asthma in a given population.^{26 27 28} It is precisely the goal of screening to find these undiagnosed cases and place them into appropriate treatment. For populations at the elementary school level, the screening questionnaire directed towards the parents of the children appears to be sufficiently sensitive for its utilization in mass screening.^{29 30} Once the children reach middle school and high school age, the situation changes. Several studies show that the students at these ages are more aware of their symptoms, particularly in relation to exercise-induced bronchospasm (EIB), than are their parents.^{31 32} In addition, at this age, the students can now more effectively participate in a running challenge test with pre- and post-peak flow meter measurements (the Free Running Athletic Screening Test³³). This test screens for EIB, the treatment of

²⁴ “Guidelines for the Diagnosis and Management of Asthma – Update on Selected Topics 2002.” (Executive Summary) U.S. Department of Health and Human Services, National Institutes of Health.

²⁵ L Gerard, et al. “A multistage asthma screening procedure for elementary school children.” *Journal of Asthma*, 2002, 39(1), 29-36.

²⁶ D Hammerman, et al. “Asthma Screening of High School Athletes: Identifying the Undiagnosed and Poorly Controlled,” *Annals of Allergy, Asthma, and Immunology*, Apr 2002: Vol.88, 380-384.

²⁷ D Kukafka, et al. “Exercise-Induced Bronchospasm in High School Athletes via a Free Running Test: Incidence and Epidemiology,” *CHEST*, 114(6), Dec.1998, 1613-1622.

²⁸ D Heaman, et al. “Screening for Exercise Induced Asthma,” *J School Health*, 1997; 67:83-88.

²⁹ TK Ninam, G Russell. “Is exercise testing useful in a community-based asthma survey?” *THORAX*, 1993 December, 48(12) 1218-21.

³⁰ TL Frank, et al. “Assessment of a simple scoring system applied to a screening questionnaire of asthma in children aged 5-15.”

³¹ “Differences between child and parent reports of symptoms among latino children with asthma.” *PEDIATRICS*, Vol.102, No.6, Dec.1998.

³² “Comparison of responses to an asthma symptom questionnaire completed by adolescents and their parents,” *Pediatric Pulmonology*, 1998 Mar; 25(3):159-66.

³³ “The Free Running Athletic Screening Test,” *Ibid*.

which significantly improves the exercise tolerance of affected individuals.³⁴ Screening of middle school children may reveal any number of unrelated medical and psychosocial conditions; for many children of this age, this is the first time that they have seen a health care professional since their routine health maintenance visit at five years of age.

³⁴ H Milgrom and L Taussig. "Keeping Children With Exercise-induced Asthma Active," PEDIATRICS, Vol.104, No.3, Sept 1999.

Appendix I: Listing of Sources for Asthma Recommendations

1. **“Improving Childhood Asthma Outcomes in the United States: A Blueprint for Policy Action”** by Marielena Lara et al., RAND Health series (RAND), 2001. The purpose of this publication is “to identify a range of policy actions in both the private and public sectors that could improve childhood asthma outcomes nationwide.” The executive summary of the report can be viewed at www.rand.org.
2. **“Improving Quality of Care for Californians with Pediatric Asthma”** by the California HealthCare Foundation (CHCF), July 2002. The document makes “...recommendations for how the CHCF and other stakeholders can build on these (existing California) initiatives to decrease the burden of asthma for children and their families in California.” It can be viewed in its entirety at www.chcf.org/documents/caredelivery/ImprovingQualityPediatricAsthma.pdf.
3. **“Healthy People 2010”** Office of Disease Prevention and Health Promotion (HP), U.S. Department of Health and Human Services, 2001. The document is “...a comprehensive set of health objectives for the nation to achieve over the first decade of the new century.” It may be viewed at www.healthypeople.gov. Recommendations on asthma are found in Volume II and can be viewed at <http://www.healthypeople.gov/Document/HTML/Volume2/24Respiratory.htm>.
4. **“Asthma in California in 2001: High Rates Affect Most Population Groups,”** California Health Interview Survey (CHIS), Policy Brief, May 2002. As discussed earlier, the survey, a collaborative effort by the UCLA Center for Health Policy Research, the California Department of Health Services, and the Public Health Institute, examines the causes of the current asthma epidemic and recommends specific policy initiatives. The document can be viewed at www.chis.ucla.edu.
5. **“Taking Action: Confronting the Health, Social and Environmental Factors Associated with Asthma in the Latino Community,”** Latino Issues Forum (LIF), January 2002. The LIF is a statewide, nonprofit public policy and advocacy institute. The purpose of the report is to “serve as a cornerstone from which we can develop policies and programs that will serve as impetus for change and curb the rise of asthma.” The report can be viewed at www.lif.org.
6. **“Strategies for Addressing Asthma Within a Coordinated School Health Program,”** Centers for Disease Control and Prevention (CDC), U.S. Department of Health and Human Services, 2002. This document identifies “six strategies for schools and districts to consider when addressing asthma within a coordinated school health program.” The full report is available at www.cdc.gov/healthyyouth/healthtopics/asthma.

Appendix II: Organizational Format of the Recommendations

Several notes regarding this organization format of the recommendations:

1. Not every organization contributed recommendations to every topic. This in no way reflects a lack of awareness or agreement by the organizations that did not make a recommendation in a particular area with those organizations that did. Each organization, in their respective publications, frequently made mention of, or supported the recommendations of, the other organizations without actually making a formal recommendation in regard to that particular topic.
2. A smaller number of recommendations for a particular topic by no means diminishes the importance of that topic to the overall issue of asthma in California. It may reflect more on the particular area of interest/expertise of the individual organization or on a more innovative approach to that particular topic by that organization.
3. Several of the recommendations made by the different organizations can be applied to more than one topic. In these cases, the recommendations were repeated. The authors of this paper have classified the recommendations regarding the different topics based on their best interpretations of the recommendations, yet we recognize that the original authors' interpretations may differ from our own, and we encourage all readers to study the original papers for their own interpretations.
4. The listing is only of asthma-related recommendations, in summary form, and does not include the implementation options, funding options, and further details that each organization offers in its respective publications. (The numbering of the recommendations within the chart relates to the number or order of the recommendation in the source documents.) Again, we encourage all readers to study the original papers to enrich their perspectives on each topic.
5. In "Section III: RECOMMENDATIONS REGARDING THE SCHOOL SYSTEM", the recommendations could all have been included in the first two sections as either "Improvement of Health Care Delivery" or "Strengthening of Public/Private Health Infrastructure." The issues regarding asthma in the school-aged population are so critical, however, and so compelling (they have a major impact on a large proportion of the "asthmatic population") and requiring of a unique approach by public and private entities alike that the authors have compiled the school-related recommendations into a separate section.

Appendix III: Asthma Recommendations Chart

I. RECOMMENDATIONS REGARDING THE IMPROVEMENT OF HEALTH CARE DELIVERY

A. Access to care

RAND 2002	CHCF 2002	HP 2010	CHIS 2001	LIF 2002
4.* Extend <u>continuous health insurance coverage</u> to all uninsured children.		24-7e. Increase the number of persons with asthma who receive <u>follow-up medical care for long-term management of asthma after any hospitalization</u> due to asthma.	3. Effective control of asthma requires <u>timely access to comprehensive health care services.</u>	1. Universal access to health care.
			4. Better control of asthma in CA requires more <u>comprehensive medical care and disease management.</u>	6. Create a program that would provide asthma medications on a sliding-fee-scale for the underinsured and uninsured patients with asthma.
				7. Increase funding for asthma programs that use “promotoras” or community health promoters within the Dept. of Health Services that focus specifically on low-income and communities of color.

* The numbering of each recommendation within the chart relates to the number or order of the recommendation in the source documents.

B. Implementation of guidelines by health plans and providers

1. Health plan and provider education

RAND 2002	CHCF 2002	HP 2010	CHIS 2001	LIF 2002
5.* Develop <u>model benefit packages</u> for essential childhood asthma services		24-4. Reduce <u>activity limitations</u> among persons with asthma (target 10%)	2. Reducing exposure to <u>environmental triggers</u> such as air pollutants, tobacco smoke, dust mites, furry pets, cockroaches, pollens, and molds can also reduce asthma episodes.	
		24-6. Increase the number of persons with asthma who receive <u>formal patient education</u> , including information about community and self-help resources, as an essential part of the management of their condition. (target 30%)	3. Effective control of asthma requires <u>timely access to comprehensive health care services</u> .	
		24-7a. Increase the number of persons with asthma who receive an <u>Asthma Management Plan</u> from their healthcare provider.	4. Better control of asthma in CA requires more <u>comprehensive medical care and disease management</u> .	
		24-7b. Increase the number of persons with asthma with <u>prescribed inhalers</u> who receive instruction on <u>how to use them properly</u> .		
		24-7c. Increase the number of persons with asthma who receive <u>education about recognizing early signs and symptoms of asthma</u> episodes and how to respond appropriately, including <u>instruction on Peak Flow Monitoring</u> for those who use daily therapy.		
		24-7d. Increase the number of persons with asthma who receive <u>medication regimens that prevent the need for more than one canister of short-acting inhaled beta-agonist per month</u> for relief of symptoms		
		24-7e. Increase the number of persons with asthma who receive <u>follow-up medical care for long-term management of asthma after any hospitalization</u> due to asthma		
		24-7f. Increase the number of persons with asthma who receive <u>assistance with assessing and reducing exposures to environmental risk factors</u> in the home, school, and work environments		

* The numbering of each recommendation within the chart relates to the number or order of the recommendation in the source documents.

2. Health plan and provider monitoring and evaluation

RAND 2002	CHCF 2002	HP 2010	LIF 2002
1.* Develop and implement <u>primary care performance measurements</u> for childhood asthma care	4. Develop a toolkit for statewide use by health plans, provider organizations, and DHS to <u>measure appropriate medication management</u>	24-6. Increase the number of persons with asthma who receive <u>formal patient education</u> , including information about community and self-help resources, as an essential part of the management of their condition. (target 30%)	3. Assess the quality of care provided for patients with asthma through the Department of Managed Health Care (DMHC).
		24-7a. Increase the number of persons with asthma who receive <u>Asthma Management Plan</u> from their healthcare provider.	4. Adopt state standards for physicians, physician groups, and managed care organizations for the diagnosis and treatment of asthma.
		24-7b. Increase the number of persons with asthma with <u>prescribed inhaler</u> who receive instruction on <u>how to use them properly</u> .	
		24-7c. Increase the number of persons with asthma who receive <u>education about recognizing early signs and symptoms of asthma</u> episodes and how to respond appropriately, including <u>instruction on Peak Flow Meters</u> for those who use daily therapy.	
		24-7d. Increase the number of persons with asthma who receive <u>medication regimens that prevent the need for more than one canister of short-acting inhaled beta-agonist per month</u> for relief of symptoms.	
		24-7e. Increase the number of persons with asthma who receive <u>follow up medical care for long-term management of asthma after any hospitalization</u> due to asthma.	
		24-7f. Increase the number of persons with asthma who receive <u>assistance with assessing and reducing exposures to environmental risk factors</u> in the home, school, and work environments.	
		24-8. Establish in at least 25 states a <u>surveillance system for tracking asthma</u> deaths, illness, disability, impact of occupational and environmental factors on asthma, access to medical care, and asthma management	

* The numbering of each recommendation within the chart relates to the number or order of the recommendation in the source documents.

C. Patient adherence to preventive measures and treatment prescriptions

1. Patient and family education

RAND 2002	CHCF 2002	HP 2010	CHIS 2001	LIF 2002
2. *Teach all children with persistent asthma and their families a <u>specific set of self-management skills</u>		24-4. Reduce <u>activity limitations</u> among persons with asthma. (target 10%)	2. <u>Reducing exposure to environmental triggers</u> such as air pollutants, tobacco smoke, dust mites, furry pets, cockroaches, pollens, and molds can also reduce asthma episodes.	
6. <u>Educate health care purchasers</u> about asthma benefits		24-6. Increase the number of persons with asthma who receive <u>formal patient education</u> , including information about community and self-help resources, as an essential part of the management of their condition. (target 30%)		
		24-7a. Increase the number of persons with asthma who receive <u>Asthma Management Plans</u> from their healthcare provider.		
		24-7b. Increase the number of persons with asthma with <u>prescribed inhalers</u> who receive instruction on <u>how to use them properly</u> .		
		24-7c. Increase the number of persons with asthma who receive <u>education about recognizing early signs and symptoms of asthma</u> episodes and how to respond appropriately, including <u>instruction on Peak Flow Meters</u> for those who use daily therapy.		
		24-7d. Increase the number of persons with asthma who receive <u>medication regimens that prevent the need for more than one canister of short-acting inhaled beta-agonist per month</u> for relief of symptoms.		
		24-7f. Increase the number of persons with asthma who receive <u>assistance with assessing and reducing exposures to environmental risk factors</u> in the home, school, and work environments		

* The numbering of each recommendation within the chart relates to the number or order of the recommendation in the source documents.

2. Case management

RAND 2002	CHCF 2002	HP 2010	CHIS 2001	LIF 2002
3. *Provide <u>case management</u> to high-risk children				

3. Community awareness

RAND 2002	CHCF 2002	HP 2010	CHIS 2001	LIF 2002
9. Launch a <u>national asthma public education campaign</u>		24-4. <u>Reduce activity limitations</u> among persons with asthma. (target 10%)	<u>2. Reducing exposure to environmental triggers</u> such as air pollutants, tobacco smoke, dust mites, furry pets, cockroaches, pollens, and molds can also reduce asthma episodes.	5. Launch a state-wide media and advocacy campaign to heighten awareness about the symptoms and causes of asthma.

D. Psychosocial and socioeconomic factors

RAND 2002	CHCF 2002	HP 2010	CHIS 2001	LIF 2002
				9. Create more affordable housing units for low-income families and individuals.
				10. Create regulations for the owners of rental units to change carpeting in between tenants, or every two years, whichever comes first.

* The numbering of each recommendation within the chart relates to the number or order of the recommendation in the source document.

II. RECOMMENDATIONS REGARDING THE STRENGTHENING OF PUBLIC/PRIVATE HEALTH INFRASTRUCTURE

A. Asthma surveillance system and identification of "pockets of need"

RAND 2002	CHCF 2002	HP 2010	CHIS 2001	LIF 2002
10. *Develop a <u>national asthma surveillance system</u>	2. <u>Identify pockets of need</u> in the state where focused improvement efforts in the care of asthma patients would make a significant impact	24-8. Establish in at least 25 states a <u>surveillance system for tracking asthma</u> deaths, illness, disability, impact of occupational and environmental factors on asthma, access to medical care, and asthma management.	1. The high rates of asthma highlight the need for <u>targeted interventions</u> and <u>continued surveillance</u> at state and local levels.	2. Create a surveillance system that tracks the incidence and prevalence of asthma in California through the California Dept. of Health Services.
	5. Create a <u>statewide registry</u> that can track the prevalence and incidence of pediatric asthma and/or other chronic conditions			20. Target areas that are disproportionately impacted for interventions.

B. Asthma collaborative/advisory group

RAND 2002	CHCF 2002	HP 2010	CHIS 2001	LIF 2002
	1. *Develop a <u>structured collaborative of providers</u> designed to <u>improve the care of the chronically ill</u> in California and focus initially on asthma			
	3. Support the DHS to develop components of the state Strategic Plan for Asthma			
	6. Establish an <u>advisory group</u> to identify specific high-leverage areas for interventions			

* The numbering of each recommendation within the chart relates to the number or order of the recommendation in the source document.

C. Coordination with private corporations

RAND 2002	CHCF 2002	HP 2010	CHIS 2001	LIF 2002
<p>6.* <u>Educate health care purchasers</u> about asthma benefits</p>		<p>24-5. <u>Reduce the number of school or work days missed</u> by persons with asthma due to asthma.</p>	<p>2. <u>Reducing exposure to environmental triggers</u> such as air pollutants, tobacco smoke, dust mites, furry pets, cockroaches, pollens, and molds can also reduce asthma episodes.</p>	<p>16. * The numbering of each recommendation within the chart relates to the number or order of the recommendation in the source document.. Local air districts, transportation authorities and industry must work together to achieve and surpass state and federal air quality standards.</p>
		<p>24-7f. Increase the number of persons with asthma who receive <u>assistance with assessing and reducing exposures to environmental risk factors</u> in the home, school, and work environments.</p>	<p>3. Effective control of asthma requires <u>timely access to comprehensive health care services.</u></p>	
		<p>24-8. Establish in at least 25 states a <u>surveillance system for tracking asthma deaths, illness, disability, impact of occupational and environmental factors on asthma, access to medical care, and asthma management.</u></p>		

* The numbering of each recommendation within the chart relates to the number or order of the recommendation in the source document.

D. Funding of organizations

RAND 2002	CHCF 2002	HP 2010	CHIS 2001	LIF 2002
7. *Establish public health grants to <u>foster asthma-friendly communities and home environments</u>				7. Increase funding for asthma programs that use "promotoras" or community health promoters within the Dept. of Health Services that focus specifically on low-income and communities of color.
				18. Fund programs and organizations that are addressing the social and environmental factors associated with asthma in low-income and communities of color.

* The numbering of each recommendation within the chart relates to the number or order of the recommendation in the source document.

E. Air quality

RAND 2002	CHCF 2002	HP 2010	CHIS 2001	LIF 2002
				8. *Increase involvement of health care providers and advocates in environmental health and justice issues.
				15. The Environmental Protection Agency (EPA) must monitor and enforce local air district plans to meet attainment standards for both ozone and particulate matter.
				16. Local air districts, transportation authorities and industry must work together to achieve and surpass state and federal air quality standards.
				17. Educate and involve community members on governance issues in order to increase civic participation around air quality issues.

* The numbering of each recommendation within the chart relates to the number or order of the recommendation in the source document.

III. RECOMMENDATIONS REGARDING THE SCHOOL SYSTEM

A. Medication/treatment and asthma education policies

RAND 2002	CDC 2002	HP 2010	CHIS 2001	LIF 2002
8. *Promote <u>asthma-friendly schools</u> and <u>school-based asthma programs</u>	1. Establish management and support systems for asthma-friendly schools.	<u>24-5. Reduce the number of school or work days missed</u> by persons with asthma due to asthma.	4. Better control of asthma in CA requires more <u>comprehensive medical care and disease management.</u>	
	2. Provide appropriate school health and mental health services for students with asthma.	24-7a. Increase the number of persons with asthma who receive <u>Asthma Management Plan</u> from their healthcare provider.		
	(Under #5.) Ensure that students have access to preventive medications before activity and immediate access to emergency medications during activity.			
	6. Coordinate school, family, and community efforts to better manage asthma symptoms and reduce school absences among students with asthma.			

* The numbering of each recommendation within the chart relates to the number or order of the recommendation in the source document.

B. Teacher education

RAND 2002	CDC 2002	HP 2010	CHIS 2001	LIF 2002
8. *(under Promote Asthma-friendly schools) Evaluation of children's ability to participate in physical education as well as support for them to do so	3. Provide asthma education and awareness programs for students and school staff.	24-4. <u>Reduce activity limitations</u> among persons with asthma. (target 10%)		14. School districts should provide training to teachers and school staff about environmental health issues such as asthma and ways to reduce triggers inside and outside of the classroom.
	5. Provide safe, enjoyable physical education and activity opportunities for students with asthma.	24-7c. Increase the number of persons with asthma who receive <u>education about recognizing early signs and symptoms of asthma</u> episodes and how to respond appropriately, including <u>instruction on Peak Flow Meters</u> for those who use daily therapy.		

* The numbering of each recommendation within the chart relates to the number or order of the recommendation in the source document.

C. Indoor air quality

RAND 2002	CDC 2002	HP 2010	CHIS 2001	LIF 2002
8. *Promote <u>asthma-friendly schools</u> and <u>school-based asthma programs</u>	4. Provide safe and healthy school environment to reduce asthma triggers.	24-7f. Increase the number of persons with asthma who receive <u>assistance with assessing and reducing exposures to environmental risk factors</u> in the home, school, and work environments.	2. <u>Reducing exposure to environmental triggers</u> such as air pollutants, tobacco smoke, dust mites, furry pets, cockroaches, pollens, and molds can also reduce asthma episodes.	12. The Dept. of Education must create policies on the use and proliferation of "bungalows" or portable classrooms.
				13. The Governor must continue to increase funding for the deferred maintenance plans in California's schools.
				14. School districts should provide training to teachers and school staff about environmental health issues such as asthma and ways to reduce triggers inside and outside of the classroom.

* The numbering of each recommendation within the chart relates to the number or order of the recommendation in the source document.

Appendix IV: Reference List

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