

# Strategic Plan for Asthma in California

*2015–2019*



April 2015



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## 2015 – 2019

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*The California Department of Public Health, California Breathing Asthma Program produced this strategic plan with the input and edits from asthma stakeholders across the state. It has been developed for use by all organizations, agencies, foundations, coalitions, advocates, and individuals working to reduce the burden of asthma in California.*

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## Executive Summary

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Through the release of the *Strategic Plan for Asthma in California, 2015–2019*, the California Breathing asthma program in the California Department of Public Health, commits to maintaining and expanding the statewide coordination, collaborations, and communication that is necessary for realizing the full impact of the activities outlined herein. The *Plan* content is the result of input and guidance from asthma experts, groups, and organizations across the state. It is designed to function as a resource for asthma interventions and activities in California. Complete implementation of this *Plan* will require the participation of California organizations, institutions, agencies, and coalitions whose missions align with reducing the burden of asthma.

Asthma is a complex disease and requires a multifaceted approach to reduce its burden on the people of California. Asthma is characterized by the inflammation and narrowing of the lung airways and is one of the most common chronic diseases in the United States. Certain races and ethnicities, as well as low-income communities bear an undue proportion of the burdens associated with asthma. For example, rates of asthma emergency department visits, hospitalizations, and mortality are 2 to 4 times higher among African Americans than among non-Hispanic Whites. The effects of poorly controlled asthma include disruption of sleep and daily activities, missed school and work days, urgent medical visits for asthma exacerbations, and even death. Approximately five million Californians have been diagnosed with asthma at some point in their lives, and almost three million currently have asthma. The costs of asthma are enormous — an estimated \$11.3 billion per year in California for direct and indirect costs.

While there is no cure for asthma, there are a variety of medical and environmental interventions and policies, which, if implemented, have been shown to help prevent asthma and control its symptoms. This *Plan* outlines steps to reduce the impact of asthma on Californians. It also offers programmatic suggestions and examples that may be used to develop requests for proposals.

The 2015–2019 *Plan* builds upon considerable work done over the last five years to implement the five goal areas in the *Strategic Plan for Asthma in California, 2008-2012*: 1) Implementation, Monitoring, and Evaluation of the *Strategic Plan for Asthma* and State Infrastructure Enhancements; 2) Surveillance and Research; 3) Health Care; 4) Indoor Environments; and 5) Outdoor Environments. The 2015–2019 *Plan* contains two new goal areas: Partnership and Collaboration, and Work Related Asthma (WRA).

Partnership and Collaboration focuses on building partnerships and developing collaborations required to reduce the impact of asthma on Californians. Progress over the past five years underscores the importance of building partnerships and collaboration to achieve optimal health of all Californians with asthma.

Work Related Asthma has been elevated to a goal to increase focus on this important area that is under recognized and under reported. It is estimated that 974,000 adults in California have asthma that has been caused or aggravated by their work. Many work

environments extend beyond buildings, especially in agricultural communities; the new goal is more inclusive of the diverse work force in California.

The original goals are updated to reflect changes that have occurred over the past five years. While using this *Plan* (as with the previous *Plan*), important cross-cutting priorities should be taken into consideration: 1) reducing asthma disparities; 2) fostering asthma awareness and education; 3) focusing on asthma throughout the lifespan; 4) changing systems and procedures within organizations to better address asthma prevention, treatment and management; 5) creating the most health protective asthma policies; and 6) addressing social determinants of health.

## Goals and Objectives

### Goal 1: Partnership and Collaboration

#### Goal Statement

Strengthen existing partnerships and collaborations and develop new ones. These partnerships and collaborations will cross public, private and community sectors and will focus on the prevention, management, and treatment of asthma in California. These partnerships and collaborations will develop and share practices and interventions to reduce the burden of asthma in California.

#### Objectives

1. Raise public awareness of asthma and of *the Strategic Plan for Asthma in California, 2015–2019*.
2. Support continued development of partnerships and collaborations to strengthen effectiveness of those working on asthma prevention, treatment and management
3. Identify and seek funding from federal and state agencies and foundations to support coalition work at the local and regional levels, asthma services, programs, and policy development.
4. Use the *Strategic Plan* as a guide to develop new, and maintain existing, partnerships and collaborations.
5. Partner and collaborate with other states, as well as national and international organizations, on the prevention and management of asthma.

### Goal 2: Surveillance and Research

#### Goal Statement

Maintain and expand asthma surveillance in California and make it available to stakeholders so data can be used to educate, plan, implement, and evaluate interventions and policies. Conduct high-quality research on the underlying causes, prevention, and management of asthma and disseminate the results for evidence-based interventions and policies within California.

**Objectives:**

1. Maintain and expand asthma surveillance in California.
2. Use surveillance data to document disparities and direct interventions that may eliminate disparities in asthma diagnosis, prevalence, management, and outcomes.
3. Ensure wide dissemination and use of relevant asthma surveillance and research findings.
4. Encourage continued investigation into the causation, prevention, aggravation, treatment, and management of asthma.
5. Use data and research findings to support policy related to asthma in California.

**Goal 3: Work Related Asthma****Goal Statement**

Prevent work-related asthma (WRA) statewide through partnerships and collaborations working to track and characterize WRA; to recognize, evaluate and reduce worker exposures; and to implement and promote prevention strategies. Workers, health care providers, employers, and asthma and environmental stakeholders will be knowledgeable about the extent and causes of work-related asthma among adults with asthma, and will include WRA in their asthma prevention approaches.

**Objectives**

1. Increase awareness and knowledge among health care providers, employers, workers, and communities about WRA and its prevention.
2. Develop and implement strategies to prevent WRA.
3. Improve WRA surveillance, and data collection and evaluation, and ensure data are used for prevention.

**Goal 4: Health Care****Goal Statement**

Provide access to comprehensive, culturally appropriate, patient- and family-centered asthma care to people in California, resulting in optimal prevention, diagnosis, treatment, and management of asthma consistent with national guidelines.

**Objectives**

1. Promote statewide implementation of “standards of asthma care” for the diagnosis and management of asthma in collaboration with California’s public, private, and community-based health care delivery systems.
2. Improve asthma knowledge and competency and increase outreach to health care practitioners, allied health professionals and community health workers serving special populations.

3. Support opportunities to increase health care providers' knowledge of environmental (indoor and outdoor) and workplace asthma triggers, and support efforts to share this knowledge with patients in order to decrease these exposures.
4. Ensure seamless/integrated asthma care and enhance communication among primary care providers, emergency departments/urgent care centers, hospital inpatient settings, school and child care settings, and other community settings within and across public, private, and community-based health care delivery systems.
5. Encourage a comprehensive chronic disease management approach to asthma within public, private, and community-based health care systems.
6. Increase access to high-quality asthma care for underserved populations in California by improving asthma knowledge and competency of health care practitioners, and by reducing barriers to care (e.g., cost, culture, language, health literacy, and location/distance).
7. Expand quality improvement for asthma care within public, private, and community-based healthcare delivery systems to assess, improve, promote, and sustain the provision of high-quality asthma care within and across systems.

## **Goal 5: Indoor Environments**

### **Goal Statement**

Assure communities in California benefit from schools, child care centers, homes, and institutional facilities that meet the needs of people with asthma and provide, to the greatest extent possible, indoor space and adjacent environments that are free from air pollutants, allergens, and chemicals that cause or exacerbate asthma.

#### **A. Schools Objectives**

1. Facilitate establishment and implementation of comprehensive asthma policies and procedures in districts and schools to ensure the health and well-being of students and staff with asthma.
2. Promote school and district implementation of, and compliance with, existing laws and regulations that impact asthma; recommend new laws/regulations or changes to existing ones as needed.
3. Increase the number of qualified personnel in schools and districts to better meet the needs of students and staff with asthma and all school visitors.
4. Institute targeted and specialized trainings for district and school personnel on asthma management and indoor environmental quality in schools; to include health personnel, administrators, teachers, front office staff, coaches, maintenance/facility personnel, food preparation workers, and bus drivers.
5. Minimize exposure to contaminated outdoor air and promote safe and healthy outdoor school environments.
6. Support the distribution of resources to enhance asthma management and indoor environmental quality in schools.

## **B. Child care Objectives**

1. Support the health and well-being of children and staff with asthma in child care settings through a set of comprehensive and coordinated asthma policies and procedures.
2. Promote regular and adequate education and training opportunities for child care providers on the management of asthma and indoor environmental quality.
3. Encourage the availability of child care health consultants and health personnel to help child care providers manage asthma.
4. Offer to discuss laws/regulations for licensed child care facilities with the California Department of Social Services (Community Care Licensing) to ensure that these laws/regulations adequately address asthma and indoor environmental quality issues and are enforced, and that there is sufficient outreach and education about the laws/regulations.
5. Minimize exposure to indoor and outdoor air contaminants to promote safe and healthy child care environments.

## **C. Housing Objectives**

1. Provide education on the importance of reducing indoor environmental risk factors in housing that contribute to asthma.
2. Promote innovative research on asthma and housing.
3. Identify, develop, and promote standards, guidelines, and model policies for home visits, assessments, and inspections in order to minimize indoor environmental risk factors that contribute to asthma.
4. Promote healthy home environments for people with asthma through augmentation of home assessments, remediation, and code enforcement.
5. Develop projects to reduce asthma morbidity and exposures to asthma triggers for people in institutional care settings, such as foster and group homes, prisons, nursing homes, and mental health institutions.

## **Goal 6: Outdoor Environment**

### **Goal Statement**

Create a healthy and safe outdoor environment for all Californians, with a focus on optimizing respiratory health.

### **Objectives**

1. Support policies that reduce outdoor exposures that contribute to asthma in the community and the outdoor workplace.
2. Promote research about outdoor exposures and asthma.
3. Increase outreach and education on outdoor exposures and asthma.
4. Support efforts to reduce asthma triggers in the built environment.
5. Reduce asthma outcome disparities and advance the principles of environmental justice by promoting equal protection from exposures for people with asthma.





## Asthma in California — A Public Health Priority

### What is Asthma?

Asthma is a common chronic disorder that affects millions of Californians and has been recognized as a growing public health concern. Asthma is characterized by the inflammation and narrowing of the lung airways. Asthma symptoms can affect a person's quality of life through disruption of sleep and usual daily activities, inability to attend school and work, and through severe attacks requiring urgent medical visits. There are also tremendous costs associated with asthma — both direct costs, such as health care services and medications, and indirect costs incurred by time lost from school, work, and premature deaths. Although asthma remains at epidemic levels, it can be controlled with proper environmental measures, self-management strategies, and quality health care services.



### The Asthma Burden

#### Asthma Morbidity and Mortality<sup>1</sup>

In May 2013, the California Department of Public Health's, California Breathing asthma program released *Asthma in California: A Surveillance Report*, a comprehensive picture of the burden of asthma in the state, compiling all available asthma surveillance data into a single source. The report is downloadable at [www.californiabreathing.org](http://www.californiabreathing.org).

As stated in the Report, approximately 5 million Californians have been diagnosed with asthma and almost 3 million suffer from current asthma. Lifetime prevalence of asthma among adults increased 72 percent from 1984 to 2010 (7.6 percent vs. 13.1 percent). Similar increases have been shown for the U.S. overall. The prevalence of lifetime asthma in California is similar to the U.S. overall.

More than 50 percent of individuals with current asthma experienced asthma attacks or episodes in 2012. In 2010, over 179,000 emergency department (ED) visits and 34,000 hospital discharges were attributed to asthma in California. About 12 percent of people hospitalized for asthma in 2010 had more than one asthma hospitalization during that year, indicating uncontrolled asthma. One encouraging trend is that there has been a decline in overall asthma hospitalization rates in California over the past

<sup>1</sup> Milet M, Lutzker L, Flattery J. *Asthma in California: A Surveillance Report*. Richmond, CA: California Department of Public Health, Environmental Health Investigations Branch, 2013.

15 years (about 32 percent) and overall U.S. rates have consistently been about 1.6 times higher than California rates.

While deaths from asthma are largely preventable, they still occur. In 2009, there were 415 deaths due to asthma in California. Asthma mortality rates in California are similar to the U.S. overall, and both have been declining significantly (about 34 to 39 percent) over the past 10 years.

### **Disparities in Asthma Burden and Risk Factors<sup>2</sup>**

There are considerable disparities in the burden and management of asthma by race and ethnicity, income, age, gender, and known risk factors. By race and ethnicity, African Americans in California suffer the most severe disparities. Compared to non-Hispanic Whites, asthma prevalence among African Americans is 40 percent higher, rates of emergency department (ED) visits and hospitalizations are about 4 times higher, and death rates are about 2 times higher. California's American Indian\Alaska Native, Pacific Islander, and Filipino populations also are more adversely affected by asthma compared to non-Hispanic Whites. Low income is a significant risk factor for asthma morbidity in California. Household income below \$20,000 is associated with poor asthma control and higher rates of asthma hospitalizations and ED visits.

Asthma disparities are also found between different age groups. While 3 times as many adults as children have asthma, children have proportionally higher asthma prevalence and hospitalization/ED visit rates. Asthma hospitalization rates are high and increasing among adults over age 65. Disparities are also found by sex. Among adults, the burden of asthma is greater for females; among children, the burden of asthma is greater for males.

Important risk factors for asthma include workplace exposures, exposure to tobacco smoke, and obesity. In California, it is estimated that over 974,000 adults have asthma that has been caused or aggravated by their work. Some of the industries and occupations with the highest rates of work-related asthma are local transit, hospitals, parks/zoos/museums, utilities, social assistance, wood manufacturing, firefighters, science technicians, medical assistants, telephone operators, chemical technicians, and respiratory therapists. Exposure to tobacco smoke is associated with increased asthma symptoms and attacks in both children and adults and also is associated with higher risk of developing new asthma.<sup>3</sup> About 10 percent of California adults with current asthma and 5 percent of California children with current asthma are exposed to to-

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2 Milet M, Lutzker L, Flattery J. *Asthma in California: A Surveillance Report*. Richmond, CA: California Department of Public Health, Environmental Health Investigations Branch, 2013.

3 National Heart Lung and Blood Institute. (February 2011). *What causes asthma?/How is asthma treated and controlled?* Retrieved from [www.nhlbi.nih.gov](http://www.nhlbi.nih.gov); Institute of Medicine. Committee on the Assessment of Asthma and Indoor Air. *Clearing the Air: Asthma and Indoor Air Exposures*. Washington, DC: Institute of Medicine, 2000.

bacco smoke in their homes, and almost 12 percent of adults and teens with current asthma are smokers.<sup>4</sup>

## Costs

The costs associated with asthma are enormous. Applying national cost estimates to California data, the total cost of asthma in California is \$11.3 billion per year. This includes \$9.6 billion in direct health care costs, \$1.5 billion for work and school days lost, and \$251 million in productivity loss due to premature death.<sup>5</sup> Charges for asthma hospitalizations alone in 2010 were over \$1 billion and the average charge per asthma hospitalization increased well over twofold since 1995 (\$13,274 vs. \$33,749, even after adjusting for inflation). Medicare and Medi-Cal cover 65 percent of asthma hospitalizations and 50 percent of asthma ED visits in California.<sup>6</sup>

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4 See note 2.

5 Barnett SBL and Nurmagambetov TA. *Costs of asthma in the United States: 2002-2007*. J Allergy Clin Immunol. 2011;127:145-52; and unpublished calculations by California Breathing asthma program.

6 Milet M, Lutzker L, Flattery J. *Asthma in California: A Surveillance Report*. Richmond, CA: California Department of Public Health, Environmental Health Investigations Branch, 2013.



## The Next Five Years: A Comprehensive Approach to Asthma

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The *Strategic Plan for Asthma in California, 2015–2019* builds upon considerable work over the last five years to implement the *Strategic Plan for Asthma in California 2008–2012*. In creating this updated version, California Breathing led an intensive review of the 2008–2012 *Strategic Plan*, surveying over 100 stakeholders about how they use the *Plan*, what parts of the *Plan* are the most (and least) useful, and suggestions for improvements. Subject matter experts provided additional input on specific goal areas during focus groups. The entire *Plan* also was reviewed by stakeholders.



This updated *Plan* includes two new goal areas: Partnership and Collaboration and Work Related Asthma (WRA). Partnership and Collaboration focuses on building partnerships and developing collaborations to promote the prevention, management, and treatment of asthma in California. Because of the multi-factorial nature of asthma, no one agency or organization can accomplish all that needs to be done. However, partnering and collaborating can leverage resources and expertise, build capacity, and achieve better outcomes. Progress over the past five years underscores the importance of building partnerships and collaborations to achieve optimal health of all Californians with asthma. Examples appear throughout

this document, highlighting the many ways partnerships have formed to work on specific areas of asthma prevention, management and treatment. Also highlighted are the ways that state and local agencies, health organizations, asthma coalitions, community organizations, and others have used the objectives and strategies in the *Plan* to help accomplish the work of their organization.

Work Related Asthma has been elevated to increase focus on this important area that is under-recognized and under-reported. It is estimated that 974,000 adults have asthma that has been caused or aggravated by their work.<sup>7</sup> In the 2008-2012 *Plan*, WRA was included in the indoor air section. Since many work environments extend beyond buildings, especially in agricultural communities, the new goal can be more inclusive of the diverse work force in California.

<sup>7</sup> Milet M, Lutzker L, Flattery J. *Asthma in California: A Surveillance Report*. Richmond, CA: California Department of Public Health, Environmental Health Investigations Branch, 2013.

## Purpose

The *Strategic Plan for Asthma in California, 2015–2019*, was written with extensive input from asthma experts across California. This *Plan* is designed for use by agencies, communities and individuals within California that have an interest in addressing the problem of asthma (*Figure 1. Who Uses the Plan?*). In the attempt to achieve a balance of aspirational and practical interventions and approaches, the *Strategic Plan for Asthma in California, 2015–2019*, sustains and builds upon substantial achievements already made in addressing asthma under the previous plan. Its purpose is to provide structure for coordinated activities across the state to mobilize individuals, organizations, communities, and state and local agencies to collectively take action on asthma over the next five years. Some objectives are easier to implement than others, but they all demonstrate beneficial practices. We anticipate each individual and organization using this plan will prioritize their efforts based on what they can achieve with their expertise and resources. This document can serve as a resource, providing organizations a choice of options to achieve their goals. Successful implementation of this *Plan* will further reduce the significant burden of asthma in California; ensure the appropriate prevention, diagnosis, and management of asthma for individuals in all settings; reduce asthma disparities; and significantly improve the quality of life for Californians affected by asthma.

## Vision Statement

In California, the most current asthma prevention and management practices occur in every setting, keeping those who develop the condition free from symptoms. Californians work cooperatively to reduce the existing burden of asthma, creating systems that prevent, heal, and manage asthma, consistent with fundamental values of equality and fairness. A vigorous and cross-disciplinary research program identifies safe and optimal measures to prevent and manage asthma. Effective and proactive asthma policies and beneficial practices are developed and implemented throughout the state, based upon the best available evidence.

## The Plan in Action

### How stakeholders are using the *Strategic Plan*

"I cite the *Plan* as the comprehensive approach needed to manage and prevent asthma"

"Useful in reporting to policy makers and stakeholders on the importance of programs and policies to address asthma"

"To assist our program in designing a plan that will address goals for improvement; help with policy related issues and the writing of informational materials; and look at best practices and interventions"

"Cited *Strategic Plan* in grant proposals"

"To demonstrate the coalition's mission and goals are in alignment with the state"

"[To] help with policy related issues and writing of informational materials"

"[To] look at best practices and interventions"

"[In] grant writing"

"*Strategic Plan* helps to provide the foundation of guiding principles, objectives and strategies for all 8 of the Central Valley Asthma Coalition's housing and community development agencies"

Statements provided by *Plan* contributors through focus groups and interviews. See *Acknowledgements*, page v.

### Figure 1. Who Uses the Plan?

California's *Strategic Plan for Asthma* is designed for use by all groups and individuals working to reduce the burden of asthma in California, which includes but is not limited to the following groups:

Public health organizations	Healthy housing stakeholders
Local health departments	Housing and community development agencies
State and local environmental agencies	Institutional settings
Asthma organizations	Urban planners
Asthma coalitions	Transportation planners
Health care providers	Policymakers
Health care delivery organizations	Advocacy organizations
Academic and research institutions	Legislators
Child care centers	Business sectors
Child care resource agencies	Environmental justice groups
Schools	Community based organizations
Workplaces	
Unions	

## Guiding Principles

The overall purpose of the *Strategic Plan for Asthma in California* is to reach and surpass the targets for asthma-related outcomes and care cited in Healthy People 2020 (*Figure 2. Healthy People 2020: Asthma Related Goals*) and to successfully achieve other goals specified in the *Plan*. Certain principles should be observed in addressing the asthma burden.

The principle of equity is guided by fairness, impartiality, and justice. When reflected in the approach to asthma, it should address disparities in the following: the incidence and prevalence of asthma; exposure to asthma triggers and irritants; the availability of preventive and management resources for asthma among subgroups of the population defined by age, race and ethnicity, gender, socioeconomic status, geographic residence, education, and literacy levels; and access to health care. A society benefits all of its members, including those who are weakest and most vulnerable.

The principle of autonomy is guided by recognition of independence and self-governance for all individuals and organizations. Every individual and organization focused on asthma has a discreet role to play in planning, implementing, and evaluating the *Plan*.

The principle of utility is guided by enhancing and maximizing the usefulness of all parts of a larger system for the greatest good. This should lead us to systems approaches to identifying problems by building partnerships and coordinating institutional, educational, and environmental changes.

## Figure 2. Healthy People 2020: Asthma Related Goals

- RD-1** Reduce asthma deaths
- RD-2** Reduce hospitalizations for asthma
- RD-3** Reduce emergency department (ED) visits for asthma
- RD-4** Reduce activity limitations among persons with current asthma
- RD-5** Reduce the proportion of persons with asthma who miss school or work days
- RD-6** Increase the proportion of persons with current asthma who receive formal patient education
- RD-7** Increase the proportion of persons with current asthma who receive appropriate asthma care according to National Asthma Education and Prevention Program (NAEPP) guidelines
  - RD-7.1** Increase the proportion of persons with current asthma who receive written asthma management plans from their health care provider according to National Asthma Education and Prevention Program (NAEPP) guidelines
  - RD-7.2** Increase the proportion of persons with current asthma with prescribed inhalers who receive instruction on their use according to National Asthma Education and Prevention Program (NAEPP) guidelines
  - RD-7.3** Increase the proportion of persons with current asthma who receive education about appropriate response to an asthma episode, including recognizing early signs and symptoms or monitoring peak flow results, according to National Asthma Education and Prevention Program (NAEPP) guidelines
  - RD-7.4** Increase the proportion of persons with current asthma who do not use more than one canister of short-acting inhaled beta agonist per month according to National Asthma Education and Prevention Program (NAEPP) guidelines
  - RD-7.5** Increase the proportion of persons with current asthma who have been advised by a health professional to change things in their home, school, and work environments to reduce exposure to irritants or allergens to which they are sensitive according to National Asthma Education and Prevention Program (NAEPP) guidelines
  - RD-7.6** (Developmental) Increase the proportion of persons with current asthma who have had at least one routine follow-up visit in the past 12 months according to National Asthma Education and Prevention Program (NAEPP) guidelines
  - RD-7.7** (Developmental) Increase the proportion of persons with current asthma whose doctor assessed their asthma control in the past 12 months according to National Asthma Education and Prevention Program (NAEPP) guidelines
  - RD-7.8** (Developmental) Increase the proportion of adults with current asthma who have discussed with a doctor or other health professional whether their asthma was work related according to National Asthma Education and Prevention Program (NAEPP) guidelines
- RD-8** Increase the number of states, territories, and the District of Columbia with a comprehensive asthma surveillance system for tracking asthma cases, illness, and disability at the state level

Source: [HealthyPeople.gov](http://HealthyPeople.gov), Respiratory Diseases (RD), Healthy People 2020 Topics and Objectives, April 2013  
 To see specific objectives for each goal, please visit: <http://healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicId=36>



## Cross-Cutting Priorities

In order to address the numerous issues impacting asthma, the *Strategic Plan for Asthma in California, 2015–2019*, emphasizes critical cross-cutting priorities throughout the document — issues that are relevant to each of the *Plan's* goal areas and often central to particular objectives and strategies. The *Plan's* cross-cutting priorities are: 1) disparities; 2) education and awareness; 3) a focus across the lifespan; 4) institutional and systems change; and 5) policy.

### Disparities

Healthy People 2020 defines health disparity as, “a particular type of health difference that is closely linked with social, economic, and/or environmental disadvantage. Health disparities adversely affect groups of people who have systematically experienced greater obstacles to health based on their racial or ethnic group; religion; socioeconomic status; gender; age; mental health; cognitive, sensory, or physical disability; sexual orientation or gender identity; geographic location; or other characteristics historically linked to discrimination or exclusion.”<sup>8</sup>

In California, asthma disproportionately burdens many disadvantaged urban and rural areas, often communities of color, creating disparities in prevention, management, and treatment. Risk factors that contribute to poor asthma outcomes, such as hospitalizations and mortality, include limited access to appropriate clinical services and/or medication, violence in the community, substandard housing, residential and industrial pollution, occupational exposures to chemicals, and schools and child care facilities in disrepair.

### Awareness and Education

Increasing awareness of asthma is a priority in the *Plan*. Asthma education and training for all affected individuals, health care providers, and those in other settings who interact closely with people with asthma are essential. Education, especially for the public, must be culturally and linguistically appropriate. Building cultural competency should be a priority for organizations working on asthma awareness and education.

### Asthma Across the Lifespan

Asthma affects individuals of all ages, from fetus to adulthood. There are different issues that come into play when addressing asthma across the lifespan. In-utero and early childhood are periods when we may be susceptible to long lasting effects of exposure to pollutants. For very young children, there are challenges related to initial diagnosis and learning to control symptoms. Adults at home and in child care facilities and schools play an important role in helping children manage their asthma. Teens and adults may develop asthma or experience asthma exacerbations due to workplace exposures, use of tobacco, and obesity, and may experience poor access

<sup>8</sup> Healthy People 2020. (December 2010). Disparities. Retrieved from [www.healthypeople.gov](http://www.healthypeople.gov).

to health care. The normal aging process or the onset of other chronic diseases may complicate the management of asthma. In some adults, chronic bronchitis, emphysema, and other types of chronic obstructive pulmonary disease may coexist or be confused with asthma. When heart disease or other chronic conditions (such as gastroesophageal reflux, obstructive sleep apnea, or obesity) develop, the control and management of asthma may become more complex.

For older adults there are additional concerns. In California, the highest mortality rate for asthma is in the population over age 65 years.<sup>9</sup> Access to quality asthma care is critical in this population. It is also important to consider the range of institutional settings where older adults may spend time, such as nursing homes and adult day care.

### Institutional and Systems Change

The development and implementation of model standards, guidelines, and policies can result in institution- and system-wide reductions in the burden of asthma in, for example, the individual school or school district, child care facility, workplace or industry, nursing homes, or larger healthcare delivery groups.

In order to implement and sustain institutional and systems change, cross-disciplinary networks and partnerships need to be developed and nurtured. Examples of such groups where partnerships could occur include organizations active in tobacco control, obesity and nutrition, environmental/green building, and community coalitions, plus regional, state-wide, and national respiratory organizations, and governments at all levels.



### Policy

Policy can include professional guidelines, standards, protocols, regulations, and legislation. The *Plan* can involve policy at every level. For this reason, it continues to be highlighted as a cross-cutting priority for *Plan* implementation. Crafting good asthma policy is founded upon assessing asthma information and planning appropriate actions. Establishing new policies often involves collaborating with diverse constituencies, raising awareness, identifying key stakeholders, and being opportunistic.

One example of an important policy change over the past five years that has impacted asthma is the Health in all Policies Executive Order S-04-10. This executive order mandates that decision-makers across 19 state agencies, departments, and offices consider health in setting their policies. The task force assigned to enact this order developed 6 aspirational goals that would lead to safe, healthy and affordable neigh-

<sup>9</sup> Milet M, Lutzker L, Flattery J. *Asthma in California: A Surveillance Report*. Richmond, CA: California Department of Public Health, Environmental Health Investigations Branch, 2013.

borhoods, housing, and food.<sup>10</sup> Achieving these goals will have a positive impact on asthma prevention through improved air quality, nutrition, and opportunity for exercise among other outcomes.

## Goals for the New *Strategic Plan*

The new *Strategic Plan for Asthma in California, 2015–2019*, outlines six major goal areas as a framework for important objectives and strategies. Each goal is shaped by a goal statement and a brief discussion of the leading issues that make it a priority, followed by an overview of important changes since the 2008–2012 *Strategic Plan for Asthma in California*. Also included are examples from stakeholders about how they've used the *Plan*.

The goals are:

**Goal 1: Partnership and Collaboration**

**Goal 2: Surveillance and Research**

**Goal 3: Work-Related Asthma**

**Goal 4: Health Care**

**Goal 5: Indoor Environments**

5a: Schools

5b: Child care settings

5c: Homes

**Goal 6: Outdoor Environment**

Ultimately, coordinated and sustained efforts to implement the *Plan's* strategies will benefit the health and well-being of millions of Californians. Successful implementation of the *Plan* will depend on collaboration, innovation, and leadership.

<sup>10</sup> Strategic Growth Council. *Health in All Policies Task Force Report to the Strategic Growth Council*. Sacramento, CA: Strategic Growth Council, Health in All Policies Task Force, 2010.



# Goals, Objectives, Strategies for the Next Five Years

## GOAL 1 Partnership and Collaboration

### Goal Statement

Strengthen existing partnerships and collaborations and develop new ones. These partnerships and collaborations will cross public, private and community sectors and will focus on the prevention, management, and treatment of asthma in California. These partnerships and collaborations will develop and share practices and interventions to reduce the burden of asthma in California.



### Overview

Partnerships and collaborations, such as California Asthma Partners (CAP), the California Healthy Housing Coalition (CHHC), and the School Environmental Health Asthma Collaborative (SEHAC), have proven very effective at addressing the needs of those with asthma in a variety of settings, and have proven the strength that comes from working collaboratively. Recognizing the success and importance of these efforts over the past five years, this goal focuses on expanding existing partnerships and collaborations and building new ones.

Since no one sector is able to adequately address asthma prevention, management, and treatment, developing partnerships and collaborations is essential. Partners are able to contribute their specific expertise, share knowledge, and leverage resources, networks, and political strength. Working collaboratively breaks down siloed strategies, reinforcing a holistic approach to asthma. Policy development is also enhanced with the addition of different perspectives.

#### SEHAC



**SCHOOL  
ENVIRONMENTAL  
HEALTH AND  
ASTHMA  
COLLABORATIVE**

The California School Environmental Health and Asthma Collaborative (SEHAC) is a statewide, volunteer-based group of influential education, environment and health professionals and organizations established to share their expertise and resources to promote effective asthma management and healthy indoor environments in California K-12 schools.

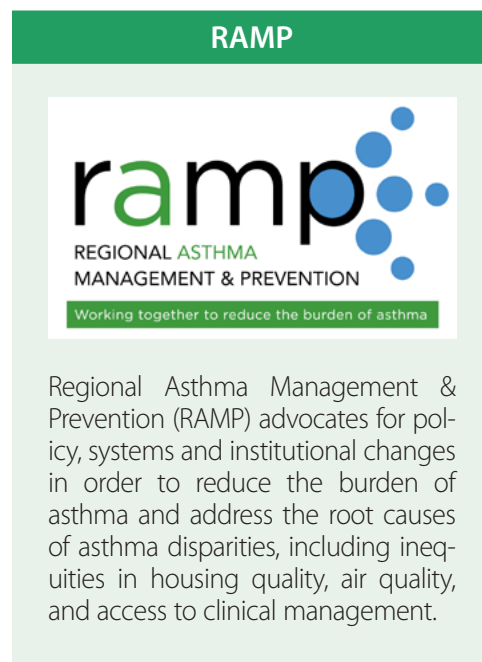
## Important Changes in the Last Five Years

The President’s Task Force on Environmental Health Risks and Safety Risks to Children endorses partnerships across all sectors to address asthma, and to advocate for research on models of partnerships that empower communities to identify and target disparate populations and provide comprehensive integrated care.<sup>11</sup> The Ditching Dirty Diesel Collaborative, a highly successful example of multisector partnership, worked with community advocates, public health researchers, government agencies, and the trucking industry to increase compliance with idling restrictions near the Port of Oakland. As another example of successful partnerships, California Breathing has provided Strategic Plan Implementation Grants (SPIG) to nine community-based organizations, a tribal epidemiology center, and four local public health departments over the last five years. These SPIGs, supported by a CDC Cooperative Agreement with CDPH, are directly related to specific goals and objectives in the *Strategic Plan for Asthma in California, 2008–2012*.

## Objectives and Strategies

### 1.1 Raise public awareness of asthma and the *Strategic Plan for Asthma in California, 2015–2019*

- 1.1.1 Promote the *Plan* to key stakeholders in public and private sectors at the local, regional, state, and national levels by broadly disseminating printed and electronic versions, and sharing recommendations with policymakers.
- 1.1.2 Take active ownership of the *Plan* by including it in your organization’s press opportunities, presentations, and media activities.
- 1.1.3 Ensure that leaders and policy makers are well informed about asthma in California, and are able to access public and private expertise regarding asthma-related issues, policy, and legislation.
- 1.1.4 Maintain a website/portal dedicated to asthma in California that will include, or link to: current data on asthma; the *Strategic Plan*; work plans for implementing the *Strategic Plan*; updates on the implementation, monitoring, and evaluation of the *Strategic Plan*; California asthma organizations; beneficial practices and educational opportunities; and information about current research in the field.\*



Regional Asthma Management & Prevention (RAMP) advocates for policy, systems and institutional changes in order to reduce the burden of asthma and address the root causes of asthma disparities, including inequities in housing quality, air quality, and access to clinical management.

11 United States Environmental Protection Agency (US EPA). *Coordinated Federal Action Plan to Reduce Racial and Ethnic Asthma Disparities*. Washington, DC: US EPA, President’s Task Force on Environmental Health Risks and Safety Risks to Children, 2012.

\* California Breathing maintains two such sites: [www.californiabreathing.org](http://www.californiabreathing.org) and [www.asthmapartners.org](http://www.asthmapartners.org)

## 1.2 Support continued development of partnerships and collaborations to strengthen effectiveness of those working on asthma prevention, treatment, and management

- 1.2.1 Support and collaborate with local asthma and non-asthma coalitions that have common goals.
- 1.2.2 Whenever possible collaborate with other public health movements (such as but not limited to health care quality improvement, health equity, poverty reduction, income/wealth disparity reduction, environmental justice, smart growth, healthy communities, health in all policies, tobacco control, obesity and diabetes initiatives, chronic disease initiatives and programs, planning and development efforts, climate change, transportation planning, sustainable energy, and green building) to prevent and control asthma and other illnesses and to create environments that will optimize health.
- 1.2.3 Develop and maintain relationships with key organizations within California that actively engage in infrastructure development, programmatic and policy development, and local and regional empowerment, such as The California Endowment, the California HealthCare Foundation, the California Wellness Foundation, and the Proposition 10 Commissions.
- 1.2.4 Support evaluation of different partnership and collaboration models to determine their effectiveness in prevention, management, and treatment of asthma.

### The *Plan* in Action

#### How stakeholders are using the *Strategic Plan* objectives and strategies to develop and advance collaborative work

“To assist our program in designing a plan that will address goals for improvement’ help with policy related issues and the writing of informational materials; look at best practices and interventions that we can use in our work with partners”

“[To] provide support for importance of collaborative efforts in California supporting the network of local asthma coalitions”

“[To] emphasize the importance of collaboration with various stakeholders—schools, health care [providers], air district, and health plans that serve low income people”

“[The *Plan*] has played a key role in our coalition meeting its mission ‘to create an asthma friendly community by promoting awareness, education, management and prevention”

“[To] provide support for the importance of collaborative efforts to address asthma in California”

Statements provided by *Plan* contributors through focus groups and interviews. See *Acknowledgements*, page v.

**1.3 Identify and seek funding from federal and state agencies and foundations to support coalition work at the local and regional levels, asthma services, programs, and policy development**

- 1.3.1 Include local funders and foundations in strategic planning meetings.
- 1.3.2 Inform funding institutions and foundations about the current state of asthma in California, new asthma research, and proven practices.
- 1.3.3 Introduce the 2015–2019 *Plan* and the 2013 *Asthma in California: a Surveillance Report* to policymakers, decision makers, grant makers, and personnel at local and state funding institutions, and foundations.

**1.4 Use the *Strategic Plan* as a guide to develop new, and maintain existing, partnerships and collaborations**

- 1.4.1 Pursue partnerships and collaborations specific to each goal in the *Plan*.
- 1.4.2 Seek opportunities for local organizations to work together with their public health departments, school boards, air districts, and others to advance the *Plan*.
- 1.4.3 Support and strengthen California Asthma Partners (CAP) to collectively implement the *Plan*.
- 1.4.4 Identify organizations and entities in the public and private sectors at the local, regional, and state levels that may wish to address specific *Plan* goals and objectives.
- 1.4.5 Encourage public and private agencies, funding organizations and asthma coalitions (at the state, regional, and local levels) to use the *Plan* to shape their internal work plans, strategic planning, and requests for proposals.

**CHHC**



The California Healthy Housing Coalition (CHHC) is a diverse, multi-sector coalition that brings together housing rights and social justice organizations; public health stakeholders; local, state, and federal agencies; and other experts on housing, indoor air quality, and health. CHHC is playing a key role in addressing home-based asthma triggers through education, outreach and policy change.

**CAP**

California Asthma Partners (CAP) is an affiliation of organizations, hospitals, schools, agencies and individuals performing a leadership role in implementing the Strategic Plan for Asthma in California. Visit their website for more information at: [www.asthmapartners.org](http://www.asthmapartners.org)



### 1.5 Partner and collaborate with other states, as well as national and international organizations, on the prevention and management of asthma

- 1.5.1 Participate in national and international initiatives and work groups pertaining to asthma, respiratory health, disparities, and/or air quality.
- 1.5.2 Present California's work on controlling asthma through programmatic actions, systems change, and policy change at state, national, and international conferences and meetings.
- 1.5.3 Consider innovative and effective asthma practices from other states and countries in planning California's ongoing asthma prevention and management efforts.

## GOAL 2 Surveillance and Research

### Goal Statement

Maintain and expand asthma surveillance in California and make it available to stakeholders so data can be used to educate, plan, implement, and evaluate interventions and policies. Conduct high-quality research on the underlying causes, prevention, and management of asthma and disseminate the results for evidence-based interventions and policies within California.

### Overview

#### What is Asthma Surveillance and Asthma Research?

Surveillance, a core function of public health, is the systematic, ongoing collection, management, analysis, and interpretation of data followed by the dissemination of these data to public health programs to stimulate public health action. Asthma surveillance is usually conducted by governmental public health agencies and describes the magnitude and nature of the asthma burden in a population, as well as the geographic and socio-demographic distribution and trends. Asthma surveillance data can also be used to evaluate the progress of programs aimed at reducing asthma burden.

Research contributes to a generalizable understanding of asthma causation, prevention, and management. Areas of asthma research include: identifying risk factors for new-onset asthma; determining the most appropriate and effective pharmacological and non-pharmacological methods for clinical asthma management; and documenting the most effective interventions that result in the primary prevention of asthma or in decreases to asthma morbidity and mortality. Additional areas covering environmental, biological, and socioeconomic factors as well as health care and community interventions and practice warrant further exploration (*Figure 3. Potential Areas for Asthma Research*).

**Figure 3. Potential Topics for Asthma Research****Environmental**

- The relationship between asthma and climate change
- The effect of exposure to the following substances on asthma: traffic-related pollution, industrial pollution, secondhand and thirdhand smoke, cleaning products, pesticides, fragrances, combustion byproducts (e.g., from cooking stoves, home appliances, wood smoke), indoor chemical emissions (e.g., formaldehyde), endocrine disruptors.
- Exposure patterns of secondhand smoke in multi-unit housing
- Identification of the specific causal agents linking mold and excess moisture to asthma

**Biological**

- Improved understanding of genetic factors related to asthma expression and control
- The role of gut flora and hygiene changes in asthma incidence
- The role of diet and nutrition in asthma incidence and morbidity
- Hormonal factors affecting asthma
- Epigenetic mechanisms affecting asthma
- The psycho-biological connections between psycho-social factors, stress, biological factors, and the immune system as they relate to asthma
- The relationship between asthma and co-morbid conditions such as obesity, COPD, and depression
- Improved understanding of the relationship of asthma to allergies, including food allergies

**Socioeconomic**

- Causes of health inequities in asthma
- The effect of social determinants of health on asthma and the interaction between individual factors and the socioeconomic context in which people live
- Up-to-date and more refined estimates of the direct medical and indirect costs of asthma in California

**Health Care**

- Safety and efficacy of and compliance with asthma medication overall, and during pregnancy
- Safety and efficacy of complementary and alternative medicine for asthma
- Barriers to asthma treatment and management
- Level of compliance with clinical asthma guidelines

**Community**

- Effectiveness of promotoras and community health workers in asthma home environmental assessments
- The magnitude, causes, and effects of asthma-related school absences
- The impact of asthma on educational performance
- Effectiveness of individualized student asthma action plans in the school setting
- Effectiveness of specific asthma interventions in different settings: clinic, home, school, workplace, and community
- Best practices for land use planning to benefit people with asthma

Both asthma surveillance and asthma research are essential for creating effective policies and interventions to prevent or control asthma.

## Important Changes in the Last Five Years

### Surveillance

The 2008 *Strategic Plan for Asthma in California* called for specific areas of expansion within the already robust asthma surveillance system. Since then, the California Department of Public Health (CDPH) has made significant progress toward meeting those objectives. New data sources have been incorporated and additional measures from existing data sources have been analyzed.

In particular, three new data sources have been added to the surveillance system maintained by CDPH: the Asthma Call-Back Survey (ACBS) within the California Behavioral Risk Factor Surveillance System (BRFSS), Medi-Cal encounter data, and the Workers' Compensation Information System (WCIS). The ACBS is a comprehensive survey of adults and children with asthma and allows for the calculation of many new measures, including: incidence, age of asthma onset, level of control, self-management knowledge, medication utilization, and home environmental risk factors. Medi-Cal encounter data provide a wealth of information on the health care experiences of California's large and particularly at-risk Medi-Cal population and allow for the calculation of new measures such as office visit frequency, medication utilization, and appropriate care following a hospital discharge. The WCIS collects data on workers' compensation claims in California and is an important additional source for identifying cases of work-related asthma (WRA).

Other notable improvements to CDPH's surveillance system since 2008 include adding zip code-level data on asthma ED visits and hospitalizations; adding questions to the California BRFSS about mold and moisture in the home, and about industry and occupation; and utilizing hospital and ED visit data as a new source for identifying cases of WRA. Additionally, asthma disparities have been examined by racial and ethnic subgroups, country of birth, sexual orientation, and other co-morbidities (such as COPD, obesity, and depression).

### The Plan in Action

#### Stakeholders are using the Surveillance and Research objectives and strategies

"We use the information in the introductory section and the surveillance and research goal to frame our discussions with elected and appointed officials"

"We are very reliant on statistics that reflect asthma prevalence"

"To help with policy related issues and the writing of educational materials"

Statements provided by *Plan* contributors through focus groups and interviews. See *Acknowledgements*, page v.

## Research

Since the release of the 2008 *Plan*, there has been significant asthma research across a broad range of topics. CDPH convened three asthma research summits, formally bringing together researchers, clinicians, and public health practitioners to share findings, practices, and ideas for future investigation. The examples that follow do not fully describe the scope of research performed, but are illustrative of the variety and importance of the work that has been done.

In recent years, research has examined influences across traditionally siloed arenas. The emerging field of cumulative impacts research examines additive and interacting effects of multiple pollutants (e.g., diesel emissions, secondhand smoke), allergens (e.g., dust mites, mold) and stressors (e.g., neighborhood violence, poverty, racism) on asthma development and prognosis. Similarly, the life course approach has been applied in examining disparities, psychosocial stress, and the interactions mentioned above. Novel research on gene-environment interactions has demonstrated that DNA-level changes with consequences for asthma are influenced by external factors including diet, pollution exposure, and stress experiences. Research on the relationship between asthma and other co-morbid conditions (e.g., obesity, COPD, depression) has also increased substantially in the last five years, yielding insights into the onset and appropriate treatment of asthma.

There have been important advances in asthma measurement. Much recent research has examined the relationship between clinical biomarkers (such as exhaled nitric oxide) and asthma diagnosis, severity assessment, and management. There also have been advances in assessing exposure to asthma-causing and exacerbating agents. For example, research indicates that sight or smell of mold in homes is as adequate an indicator of exposure as other more costly and time-consuming methods. Recent research on ultrafine particulate matter suggests that, rather than relying on traditional mass measurements, assessing particle count and composition can provide a better indicator of health outcomes. In addition, advances in categorizing and classifying workplace exposures as either sensitizers (asthmagens) or irritants will help clinicians determine whether a patient's asthma might be work-related and make prevention and remediation efforts more effective.

Advances also have been made in translational research that focuses on moving basic science findings into practice. For example, since the last *Plan*, studies have shown that comprehensive, home-based, multi-component, environmental interventions are effective in reducing asthma morbidity in children. Another example is the successful transition of many child care centers away from the use of bleach (an asthma-causing and exacerbating agent) and toward equally effective asthma-safe disinfecting agents.



## Objectives and Strategies

### 2.1 Maintain and expand asthma surveillance in California

- 2.1.1 Maintain asthma surveillance in California by fully utilizing available data sources, including the BRFSS, the ACBS, the California Health Interview Survey (CHIS), the Office of Statewide Health Planning and Development (OSHPD) databases, Vital Statistics, Medi-Cal encounter data, Doctor's First Reports of Occupational Injury and Illness (DFRs), and the WCIS.
- 2.1.2 Calculate asthma measures using standardized definitions and statistical methodologies. Measures include asthma prevalence, incidence, level of control, morbidity, mortality, management, health care utilization, triggers, and risk factors.
- 2.1.3 Regularly report asthma surveillance findings through a comprehensive surveillance report, county asthma profiles, and other fact sheets and data tables.
- 2.1.4 Expand asthma surveillance in California. Some priority areas for expansion are listed in Figure 4. Of particular importance are: 1) increasing WRA reporting by health care providers; and 2) expanding local data such as zip code, census tract, or geocoded address level.
- 2.1.5 Prioritize collection and analysis of data that will be useful in developing and evaluating key policies and interventions identified by stakeholders.

### 2.2 Use surveillance data to document disparities and direct interventions that may eliminate disparities in asthma diagnosis, prevalence, management, and outcomes

- 2.2.1 Identify and monitor disparities in asthma in California. Disparities are defined widely and can include a variety of characteristics, such as those listed in Figure 5.
- 2.2.2 Raise awareness of asthma disparities in California by highlighting disparity data in all surveillance findings.
- 2.2.3 Use findings on identified disparities to target interventions that reduce inequities.
- 2.2.4 Utilize surveillance data to focus prevention efforts by identifying high-risk industries, occupations, worksites, and exposures.

### 2.3 Ensure wide dissemination and use of relevant asthma surveillance and research findings

- 2.3.1 Provide public access to up-to-date asthma surveillance findings through regular reporting of findings and provide customized data reports upon request.
- 2.3.2 Ensure wide dissemination of surveillance findings through a well-publicized website, newsletters, emails to a thoroughly compiled list of asthma stakeholders, webinars, and other formats.

#### Figure 4. Strategies for Expanding Asthma Surveillance

- Increase the level of resolution for local information (e.g., sub-county, zip code, census tract, geocoded address) by collecting and/or accessing more local-level data or by using analytical methods such as spatial modeling and small area estimation.
- Provide more information about populations with small sample sizes (e.g., rural areas, ethnic subgroups).
- Use data from health information exchanges and/or electronic health records as they expand and possibly become available for public health surveillance.
- Use data from managed care organizations to better understand asthma.
- Expand the use of Medi-Cal and Medicare data to better understand asthma.
- Identify ways to increase reporting of WRA by health care providers as required by Labor Code Section 6409.
- Characterize populations of workers that are not in the current surveillance system.
- Use pharmacy records to track the use of asthma rescue and controller medications.
- Track asthma in schools (e.g., prevalence, school absences, 911 calls and hospitalizations during school hours).
- Track 911 calls for asthma.
- Assess asthma knowledge, attitudes, beliefs, and practices among health care providers, teachers, and other professionals who might influence the burden of asthma.
- Collect information on clinician adherence to NHLBI guidelines.
- Provide more information on co-morbid conditions such as rhinitis/sinusitis, obstructive sleep apnea, gastro-esophageal reflux disease, and others.
- Expand measurement and tracking of measures of asthmagens, asthma triggers, and other risk factors.
- Expand tracking of social determinants of health that influence asthma (e.g., adverse childhood experiences, community violence and crime, employment, environmental justice).
- Provide more information about the risk factors driving repeat asthma hospitalizations.
- Estimate the prevalence of undiagnosed asthma.
- Provide more information about individuals with poorly-controlled asthma.
- Develop and encourage methods for individuals and communities to collect local and real-time data.
- Use novel measurement technologies to collect spatial and temporal data on the occurrence of asthma episodes and exposure to asthma triggers.
- Combine county asthma indicators into a county-level asthma risk index.
- Integrate data sources as much as possible. Find ways to combine datasets to look for new correlations, interactions, and patterns in the data.

**Figure 5. Demographic Factors to Consider When Examining Disparities**

- Age
- Sex
- Race/ethnicity
- Ethnic subgroups
- Geography (e.g., county or neighborhood of residence, workplace, or school)
- Urban/rural residence
- Income/poverty
- Education
- Literacy
- Sexual orientation and gender identification
- Primary language
- Country of origin
- Insurance status
- Employment status
- Industry and occupation (including hard to capture groups such as migrant farm workers)
- Housing characteristics, including tenure (rent vs. own)
- Health status (e.g., disability, obesity, psychological distress, COPD, and other co-morbidities)

2.3.3 Provide technical assistance to stakeholders in order to build capacity for collecting, understanding, and using asthma data.

2.3.4 Ensure that reports of findings are presented in multiple formats, including those that are accessible and understandable to non-technical audiences. In addition to print and web-based reports, this should include in-person presentations and interactions with targeted communities.

2.3.5 Ensure access to novel and significant peer-reviewed asthma research findings through websites, newsletters, and other formats.

2.3.6 Survey asthma stakeholders on a regular basis to assess the current utility and limitations of asthma surveillance and to identify strategic priorities for the modification and/or expansion of asthma surveillance efforts, including both the types of data reported and the methods of reporting.

2.3.7 Continue and expand opportunities for data sharing among government agencies, non-governmental organizations, and the public.

## **2.4 Encourage continued investigation into the causation, prevention, exacerbation, treatment, and management of asthma**

2.4.1 Encourage asthma research that will have the greatest potential impact on overall asthma burden and on those populations disproportionately affected.

2.4.2 Ensure adequate resources for asthma research and facilitate the distribution of resources to stakeholders who may have difficulty accessing them.

2.4.3 Promote multi-factorial, cross-disciplinary research by encouraging partnerships and fostering communication across different fields of study.

- 2.4.4 Encourage partnerships and foster communication between researchers, clinicians, public health practitioners, and communities affected by asthma.
  - 2.4.5 Convene an asthma research symposium every two years to summarize and assess recent important research findings; address current interests and questions suggested by the broader asthma community; and exchange ideas between researchers, clinicians, and public health practitioners.
- 2.5 Use data and research findings to support policy related to asthma in California**
- 2.5.1 Regularly share data reports and key research findings with community leaders, legislators, and key decision makers within governmental and non-governmental institutions.
  - 2.5.2 When data are limited or unavailable, use expert opinion and the best available evidence to assess and inform policy decisions.
  - 2.5.3 Use asthma data to monitor and evaluate asthma interventions.

## **GOAL 3 Work-Related Asthma**

### **Goal Statement**

Prevent work-related asthma (WRA) statewide through partnerships and collaborations working to track and characterize WRA; to recognize, evaluate and reduce worker exposures; and to implement and promote prevention strategies. Workers, health care providers, employers, and asthma and environmental stakeholders will be knowledgeable about the extent and causes of work-related asthma among adults with asthma, and will include WRA in their asthma prevention approaches.

### **Overview**

Work-related asthma is caused or triggered by conditions or substances in the workplace, and is a significant public health problem. It includes asthma that newly develops from workplace exposures, also known as new-onset asthma, as well as pre-existing asthma that is exacerbated by conditions in the workplace. A common misconception is that WRA is limited to workplaces using large amounts of chemicals, such as manufacturing plants, auto body repair shops, and laboratories. But all people who work are at risk for WRA, since every workplace contains substances or conditions that can cause or contribute to asthma. For example, in schools, hospitals, offices, and restaurants, people are commonly exposed to cleaning or renovation chemicals.

It is estimated that 974,000 adults in California have WRA. Survey data show that 40 percent of adults with current asthma report that their asthma was caused or aggravated at work. Surveillance data show that among people with WRA, 56 percent were either unable to perform their usual work or had to perform modified work, and 29



percent left their job either against their will or voluntarily due to their asthma. Over 60 percent had been to the emergency department for their WRA on average twice since their breathing problems at work began.<sup>12</sup> Current surveillance efforts underestimate the extent of WRA, and it is possible that workers in some of the highest risk-jobs may be the least likely to be captured by a data system.<sup>13</sup>

Although WRA is very often unrecognized and therefore not always diagnosed or reported, it is preventable. The most important treatment for WRA is to identify the conditions in the workplace that trigger asthma, and control or eliminate them. Many of the most common substances associated with WRA are used in environments such as schools, hospitals, and government buildings where the general public is also exposed. Prevention of these exposures protects workers as well as other members of the public who spend time in these settings.



Accomplishing the WRA objectives will improve data collection, surveillance, and evaluation, as well as data utilization. Prevention strategies will be promoted and implemented. Collaboration with, and education of, health care providers, employers, workers, communities, and regulatory agencies is recommended. Strategies for the prevention of WRA should be recognized and promoted by all organizations addressing adult asthma.

### Important Changes in the Last Five Years

- Surveillance has been expanded to include three additional data sources, increasing four-fold the number of confirmed cases identified annually.
- Based on new analyses of WRA indicators from California's Behavioral Risk Factor Surveillance System (BRFSS), it is estimated that 40% of adults with asthma statewide have experienced WRA.
- New estimates of the true number of WRA cases based on capture-recapture analysis suggest 2,000–3,700 per year, an increase over previous estimates.
- Third party certification requirements now prohibit asthmagenic ingredients in cleaning products and other commercial products.
- Resources, including guidelines, webinars, and toolkits, have been developed to help schools and child care facilities transition to asthma-safe cleaning and sanitizing methods and materials.

<sup>12</sup> Millet M, Lutzker L, Flattery J. Asthma in California: A Surveillance Report. Richmond, CA: California Department of Public Health, Environmental Health Investigations Branch, 2013.

<sup>13</sup> Reinisch F, Harrison RJ, Cussler S, et al. *Physician reports of work-related asthma in California, 1993-1996*. Am J Ind Med. 2001;39(1):72-83.

- Organizations that typically focus on general asthma prevention, environmental advocacy, low-wage worker advocacy, and local jurisdiction issues now recognize the importance of WRA and include WRA issues in their activities, publications, and strategies.
- A train-the-trainer curriculum and educational materials about WRA were developed for non-English speaking workers.

## Objectives and Strategies

### 3.1 Increase awareness and knowledge among health care providers, employers, workers, and communities about WRA and its prevention

- 3.1.1 Include WRA in community efforts focusing on asthma prevention and disparities among adults.
- 3.1.2 Identify existing opportunities to educate health care providers and incorporate information on WRA. Materials and trainings could include: asthmagenic exposures in the workplace, guidelines, tools, and resources for evaluation and diagnosis of WRA, and reporting requirements for workplace illness, including WRA (Labor Code Section 6409). Explore incorporating WRA into existing medical and nursing school curricula.
- 3.1.3 Develop and disseminate information to identified employers on known asthma triggers/causes and their prevention. Utilize existing outreach channels such as trade organization newsletters and publications to publicize information about WRA and interventions, and to collaborate on trainings for employers. Make use of social media to extend outreach to worker populations that may not be reached by traditional means.
- 3.1.4 Encourage the use of existing resources in the workplace (e.g., employee health clinics) for outreach and education about WRA to workers.
- 3.1.5 Conduct linguistically and culturally appropriate outreach and education about WRA to workers in high-risk occupations.
- 3.1.6 Collaborate with unions, work centers, and other labor oriented organizations, and promotoras, to distribute materials and conduct training about WRA to workers. Provide information on asthma and asthma risk factors to self-employed workers, such as house cleaners and day laborers.
- 3.1.7 Collaborate with environmental health stakeholder groups to raise awareness of WRA and to consider workplace environmental issues.

### 3.2 Develop and implement strategies to prevent WRA

- 3.2.1 Collaborate with environmental asthma stakeholders, and other groups who do not ordinarily focus on workers, to promote WRA prevention strategies in their ongoing efforts to prevent asthma among adults.

- 3.2.2 Implement work-site evaluations and exposure assessments with selected employers to identify potential asthma-causing conditions in the workplace. Evaluate and promote effective interventions for WRA in targeted industries.
- 3.2.3 Promote workplace efforts to reduce or eliminate exposures, including substituting sensitizers and asthma-triggering substances with safer alternatives; implementing engineering and administrative controls; and as a last resort, appropriately using personal protective equipment (e.g., respiratory protection).
- 3.2.4 Promote the inclusion of asthma prevention and medical surveillance in workplace Illness and Injury Prevention Programs (IIPPs).
- 3.2.5 Encourage asthma prevention in specific industries by demonstrating its benefits to employers, including cost savings.
- 3.2.6 Provide data and technical assistance on the potential of regulated chemicals to cause asthma or respiratory sensitization when setting standards. Offer to work with occupational health and safety professionals on how to include respiratory sensitization in their worksite assessments and make recommendations to prevent it.
- 3.2.7 Develop collaborative prevention efforts in the community and the workplace by identifying public spaces that are also workplaces (e.g., hospitals, schools, public transportation, government buildings, parks, and recreational lands) and developing strategies that address occupational and environmental exposures.
- 3.2.8 Educate stakeholders and promote the use of 3rd party product certification standards that protect workers and the public from asthmagens in commercial products, such as construction materials and cleaning products.
- 3.2.9 Promote workplace policies regarding the use of perfumes, cleaning agents, disinfectants, etc., to reduce WRA by providing targeted information to employers and employee groups.

### **3.3 Improve WRA surveillance, and data collection and evaluation, and ensure data are used for prevention**

- 3.3.1 Maintain statewide surveillance for WRA (*Figure 6. Current Work Related Asthma Surveillance Data Sources*).
- 3.3.2 Identify ways to increase reporting of WRA by health care providers as required by Labor Code Section 6409.
- 3.3.3 Evaluate and potentially add new data sources to expand surveillance. Characterize populations of workers that are not in the current surveillance system.

### Figure 6. Current Work-related Asthma Surveillance Data Sources

- Doctor's First Reports of Occupational Injury or Illness (DFRs) have been collected and entered into the surveillance system since 1993. DFRs must be completed by all health care providers when an injury or illness is suspected to be work-related.
- Patient discharge data have been used since 2003 to identify all California adults hospitalized with asthma where workers' compensation is the expected payer, or a code indicates the asthma happened at work.
- Emergency department data have been used since 2005 to identify adults with asthma seen in any California emergency department when workers' compensation is the expected payer, or a code indicates the asthma happened at work.
- Workers' Compensation Information System data have been used since 2006 to identify all claims for WRA.
- All new cases identified through any data source (approximately 700 per year) receive follow-up in the form of a telephone interview when possible, and, in some cases, a medical records review.

3.3.4 Utilize surveillance data to focus prevention efforts by identifying high-risk industries, occupations, worksites, and exposures.

3.3.5 Increase access and usefulness of WRA surveillance data by preparing and disseminating information on current incidence, prevalence, and trends. Post surveillance data on the web, and distribute widely via email, newsletters, and social media.

## GOAL 4 Health Care

### Goal Statement

Provide access to comprehensive, culturally appropriate, patient- and family-centered asthma care to people in California, resulting in optimal prevention, diagnosis, treatment, and management of asthma consistent with national guidelines.

### Overview

Asthma is a complex chronic disease, with variable presentation, symptoms, triggers, severity, and progression. High quality and effective asthma care includes accurate diagnosis and evaluation, appropriate treatment, effective patient education on prevention and self-management, successful interventions, and regular clinical follow-up. Successful and productive engagement with the patient provides the basis for effective patient education and self-management, and patient follow-through.

Since 1991, the National Asthma Education and Prevention Program (NAEPP) has provided clinical guidelines and updates on the appropriate diagnosis and management of asthma. The NAEPP Expert Panel Report-3 (EPR-3) released in 2007, is an update to the 2003 Guidelines for the Diagnosis and Management of Asthma.<sup>14</sup> While most health care providers are aware of these national standards, many patients in California do not receive all of the recommended components of quality asthma care from the health care system. Studies have documented that poor care particularly burdens low socioeconomic status, uninsured, rural, and racially/ethnically diverse populations. These disparities may be in part due to barriers to care such as language, access, health literacy, insurance status, citizenship status, and medication costs.<sup>15</sup>

Various models of intervention have successfully targeted these and other barriers and have resulted in improved clinical care and outcomes, particularly for young and vulnerable populations. Such interventions have included use of the Chronic Care Model (Figure 7. Overview of the Chronic Care Model) and case management as cost-effective approaches for ensuring equitable, quality asthma care. The Chronic Care Model emphasizes patient education and involvement regarding their healthcare. In this model patients partner with a proactive practice team in the context of a coordinated health care system that uses information



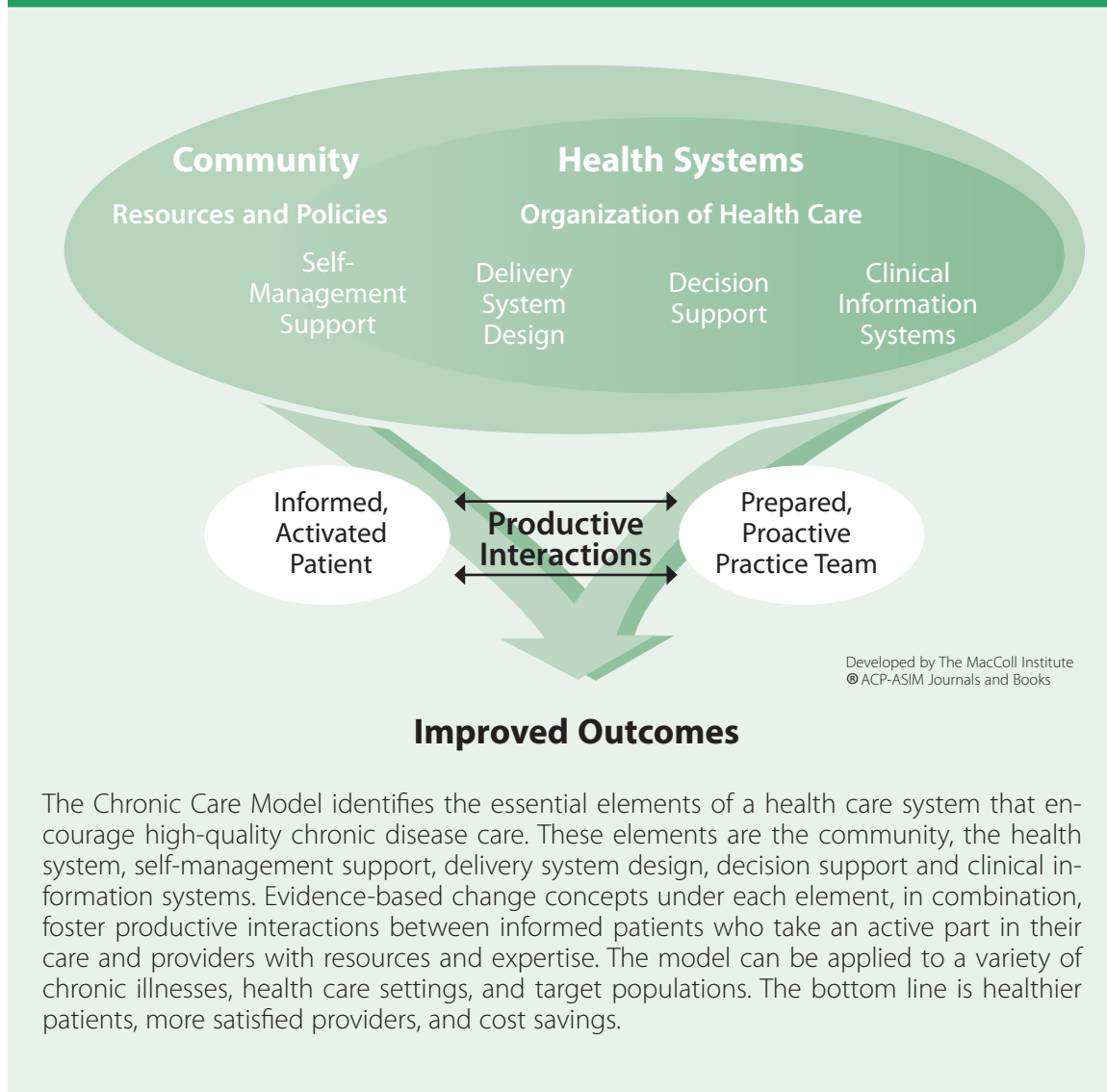
systems effectively. Decision support, an element of the Chronic Care Model, as related to asthma, can include things such as having copies of the NAEPP guidelines readily at hand as well as incorporating them into the Electronic Health Record (EHR). This can increase a practitioner's ability to provide preventive care to asthma patients and engage them in more effective self-management. For example, a school-based clinic developed a registry of the students with asthma, identified their triggers and season when their asthma was more likely to increase in severity. This provided the information necessary to pro-actively engage the students with reminders about preventive care.<sup>16</sup>

The Patient Centered Medical Home (PCMH), described in Figure 8, is featured prominently in the Affordable Care Act (ACA). The PCMH has emerged as one model to provide better continuity of care; improved communication between patients, primary care providers, and specialists; and care that is coordinated and integrated across all elements of the health care system. Facilitated by the use of patient registries and health

14 National Asthma Education and Prevention Program. *Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma*. Bethesda, MD: National Institutes of Health, 2007.

15 Meng YY, Babey SH, Hastert TA, Brown ER. *California's Racial and Ethnic Minorities More Adversely Affected by Asthma*. Los Angeles, CA: UCLA Center for Health Policy Research, 2007; Babey SH, Hastert TA, Meng YY, Brown ER. *Low-Income Californians Bear Unequal Burden of Asthma*. Los Angeles, CA: UCLA Center for Health Policy Research, 2007.

16 National Coalition on Health Care and the Institute for Healthcare Improvement. *Accelerating Change Today for America's Health*. Washington, DC: National Coalition on Health Care and the Institute for Healthcare Improvement, 2002.

**Figure 7. Overview of the Chronic Care Model**

The Chronic Care Model identifies the essential elements of a health care system that encourage high-quality chronic disease care. These elements are the community, the health system, self-management support, delivery system design, decision support and clinical information systems. Evidence-based change concepts under each element, in combination, foster productive interactions between informed patients who take an active part in their care and providers with resources and expertise. The model can be applied to a variety of chronic illnesses, health care settings, and target populations. The bottom line is healthier patients, more satisfied providers, and cost savings.

information technology such as EHRs, the Patient-Centered Medical Home often incorporates the Chronic Disease Model to address diseases such as diabetes and asthma.

### Important Changes in the Last Five Years

The federal Patient Protection and Affordable Care Act (ACA), is the largest expansion in healthcare coverage since Medicare and Medicaid were enacted in 1965. The ACA requires that states set up their own marketplace (Health Exchanges) or have the federal government set one up for them. Health plans sold through the exchanges must cover 10 categories of “essential health benefits,” one of which is preventive and wellness services, and chronic disease management. However, there is no coverage for asthma preventive services except indirectly through tobacco cessation interventions

### Figure 8. Principles of the Patient-Centered Medical Home

1. Each patient has a personal physician.
2. The model of care focuses on the whole person, not just one disease or body system.
3. The personal physician leads a team of individuals at the practice level who collectively take responsibility for the ongoing care of patients.
4. Care is coordinated and integrated across all elements of the health care system and community facilitated by the use of patient registries and health information technology such as EHRs.
5. The medical practice focuses on quality and safety, for example: practices use evidence-based decision support to help provider and patient arrive at optimal care decisions; information technology such as electronic records and e-prescribing are used; there is performance feedback to providers with active engagement in QI; there is patient education and incorporation of patients' feedback into provider decision making.
6. Access increases, for example: includes timely access to care and improved methods of communication including email and telephone between patients and providers.
7. Payment reform encapsulates changes in health care financing and physician payment systems to support the other components of the model.

(Figure 9. *The Affordable Care Act and Asthma*). Asthma falls under the broad category of "chronic disease management," and states will determine whether to include asthma self-management education and home trigger reduction services in their package of essential health benefits.

In addition, over the past five years, new modes of treatment and training have been put into practice:

- Stress has been identified as an important element in exacerbation of asthma, and stress reduction is becoming an integrated part of medical management with documented evidence of improved outcomes.
- Bronchial thermoplasty, a new procedure, is being used with severe asthmatics and has resulted in a reduction in asthma attacks, emergency room visits, lost work and school days, and hospitalizations.<sup>17,18</sup>
- Training, such as Physician Asthma Care Education (PACE) and Nurses Asthma Care Education (NACE) continues to provide medical staff with the additional skills need-

<sup>17</sup> Bronchial thermoplasty is a treatment for severe asthma approved by the FDA in 2010 involving the delivery of controlled, therapeutic radiofrequency energy to the airway wall, thus heating the tissue and reducing the amount of smooth muscle present in the airway wall.

<sup>18</sup> Castro M, Rubin AS, Laviolette M, et al. *Effectiveness and Safety of Bronchial Thermoplasty in the Treatment of Severe Asthma: A Multicenter, Randomized, Double-Blind, Sham-Controlled Clinical Trial*. *American Journal of Respiratory and Critical Care Medicine*. 2010;181(2):116.

### Figure 9. The Affordable Care Act and Asthma

The affordable Care Act (ACA), fully implemented in January 2014, has created the greatest expansion in healthcare coverage since Medicare and Medicaid (MediCal in California) were enacted in 1965. The ACA is a complicated piece of legislation and will continue to evolve over time. There is no coverage for asthma preventative services except indirectly through tobacco cessation interventions. Asthma falls under the broad category of “chronic disease management,” and states will determine whether to include asthma self-management education and home trigger reduction services in their package of essential health benefits. The George Washington School of Public Health’s Department of Health Policy has published five papers on opportunities to improve asthma outcomes through leveraging the ACA.

ed to provide enhanced asthma care.<sup>19</sup> The PACE program was created to enhance treatment of asthma and the physician-patient partnership. There is more emphasis on identifying asthma co-morbidities such as obesity, obstructive sleep apnea, and chronic obstructive pulmonary disease, among others and the treatment of asthma within the context of chronic disease management. Medical providers are using integrative approaches to asthma because they recognize that personalized care and treatment of co-morbidities play a prominent role in asthma management.<sup>20</sup>

- Improving diet as a way of reducing inflammation is recognized as a remedy for a number of chronic diseases, including asthma.
- California Conference of Local Health Officers (CCLHO) and County Health Executives Association of California (CHEAC) released a report emphasizing the importance of chronic disease prevention, including respiratory diseases, through a framework that highlights sustainable community strategies such as complete streets as well as other environmental approaches.<sup>21</sup>

### The Plan in Action

#### How stakeholders are using the Health Care objectives and strategies

“Developed the community asthma clinic free to all patients for follow-up, education and treatment of asthma”

“Used with pediatric residents to provide comprehensive view of asthma”

“Cite Plan as the comprehensive approach needed to manage and prevent asthma/ useful to show that there is no ‘silver bullet’ for the issue of asthma”

Statements provided by *Plan* contributors through focus groups and interviews. See *Acknowledgements*, page v.

<sup>19</sup> The Center for Managing Chronic Disease. *Nurse Asthma Care Education (NACE)*. Retrieved from [cmcd.sph.umich.edu](http://cmcd.sph.umich.edu).

<sup>20</sup> AsthmaNet is a nationwide clinical research network created by the National Heart Lung and Blood Institute (NHLBI) in 2009. The purpose of AsthmaNet is to develop and conduct multiple clinical trials that explore new approaches in treating asthma from childhood through adulthood. AsthmaNet studies are being conducted in 13 states.

<sup>21</sup> California Conference of Local Health Officers and County Health Executives Associate of California (CCLHO-CHEAC). *Chronic Disease Prevention Framework*. Sacramento, CA: CCLHO-CHEAC, 2013.



## Objectives and Strategies

- 4.1 Promote statewide implementation of “standards of asthma care” for the diagnosis and management of asthma in collaboration with California’s public, private, and community-based health care delivery systems
- 4.1.1 Convene representatives from the major public, private, and community-based health care delivery systems to promote statewide standards of asthma care consistent with the current National Asthma Education and Prevention Program’s (NAEPP) Guidelines for the Diagnosis and Management of Asthma (Expert Panel Report-3), and the NAEPP’s *Key Clinical Activities for Quality Asthma Care* (Figure 10).
  - 4.1.2 Promote comprehensive care management as the standard of care for individuals with poorly controlled persistent or high-risk asthma (those with frequent ED or hospital visits) (Figure 11. *Comprehensive Care Management for Asthma*).
  - 4.1.3 Consistently assess patient asthma control with validated tools such as the Asthma Therapy Assessment Questionnaire (ATAQ), Asthma Control Questionnaire (ACQ), and Asthma Control Test (ACT), and track patients’ results in their EHR.
  - 4.1.4 Support the use of spirometry in assessing asthma patients.

**Figure 10. Key Clinical Activities for Quality Asthma Care\***

### Assessment and monitoring

1. Establish asthma diagnosis
2. Classify initial severity of asthma
3. Schedule routine follow-up care at 1-6 month intervals to monitor asthma control, including spirometry every 1-2 years
4. Assess for referral to specialty care

### Control of factors contributing to asthma severity

1. Recommend measures to control asthma triggers
2. Treat or prevent co-morbid conditions

### Pharmacotherapy

1. Prescribe medications according to initial severity and adjust accordingly to level of control
2. Monitor use of  $\beta_2$ -agonist medication (assess compliance and side effects)

### Education for partnership in care

1. Develop a written asthma management plan
2. Provide routine education on patient self-management

\*Adapted from NAEPP Key Clinical Guidelines for Quality Asthma Care and EPR-3.

### Figure 11. Comprehensive Care Management for Asthma

Includes the following:

- Population care coordination augmented with case management for individuals with poorly controlled and high-risk asthma
- Recognition of the potential variability of asthma symptoms for some individuals related to the calendar year, seasonality.
- Self-management education for all individuals with asthma.
- In-home asthma environmental assessments as determined to be medically necessary.
- Coverage for asthma management and prevention supplies (e.g., inhaler spacers, nebulizers, peak flow meters, pillow\mattress encasements, etc.).
- Patient tracking over time in a series of asthma preventive care clinic visits.
- Training for all members of the care team (physicians, nurses, community health workers, etc.)
- Multidisciplinary asthma care teams consisting of a physician/nurse practitioner, clinical care coordinator (typically a registered nurse or respiratory therapist), pharmacist, community care worker, health educator or public health nurse. Intensity of care and number of professionals involved would be adjusted based on the needs of the patient.

4.1.5 Promote opportunities for health care providers to share knowledge, experiences, and best practices, utilizing existing venues (e.g., medical practitioner associations, collaborative quality improvement learning networks, and asthma research conferences).

4.1.6 Support a California ACA essential health benefits package that includes non-clinical, evidence-based asthma preventive services as a standard of care.

#### **4.2 Improve asthma knowledge and competency and increase outreach to health care practitioners, allied health professionals, and community health workers serving special populations**

4.2.1 Increase understanding that asthma prevention, management, and treatment in any setting should extend to staff who work in those settings.

4.2.2 Increase outreach to school and child care personnel to increase asthma recognition, improve treatment, and reduce asthma triggers in the home, school, and child care setting.

4.2.3 Educate health care providers, allied health professionals, and community health workers (CHWs) on the importance of maternal asthma control during pregnancy.

4.2.4 Improve recognition of asthma treatment and management specific to older women.

4.2.5 Promote statewide standing order protocols for emergency medical technicians (EMT) and other “pre-hospital providers,” consistent with the California Emergency Medical Services Authority EMT-II Model Curriculum.

**4.3 Support opportunities to increase health care providers' knowledge of environmental (indoor and outdoor) and workplace asthma triggers, and support efforts to share this knowledge with patients in order to decrease these exposures**

- 4.3.1 Facilitate collaboration among health care providers and state and private organizations and agencies (e.g., California Air Resources Board, American Lung Association, etc.) to increase health care providers' understanding of indoor and outdoor triggers.
- 4.3.2 Encourage the addition of questions about environmental and workplace exposures to EHR/patient history forms.
- 4.3.3 Educate patients and their families about environmental and workplace asthma triggers.
- 4.3.4 Promote an increase in hospital and clinic use of green cleaning products, and other practices that reduce patient and staff exposure to chemicals that may cause or exacerbate asthma.
- 4.3.5 Identify staff and patients with latex allergies and ensure they aren't exposed to latex in health care settings.
- 4.3.6 Educate patients, families, and staff about asthma triggers in the school, child care, and home settings to reduce exposures.
- 4.3.7 Decrease exposure to asthma triggers in homes by educating landlords about their responsibility to provide a healthy, habitable environment.
- 4.3.8 Support decreased exposure to secondhand and thirdhand smoke in all environments and settings.

**4.4 Ensure seamless/integrated asthma care and enhance communication among primary care providers, emergency departments/urgent care centers, hospital inpatient settings, school and child care settings, and other community settings within and across public, private, and community-based health care delivery systems**

- 4.4.1 Support the use of models, such as the Patient Centered Medical Home (Figure 16) and the Chronic Care Model (Figure 15), for the delivery of integrated and comprehensive asthma care.
- 4.4.2 Encourage the use of chronic disease patient/case registries to improve case finding and patient monitoring, and track improvement.
- 4.4.3 Encourage and support timely sharing of patient data between primary care providers, emergency departments, urgent care centers, and hospital inpatient settings and health insurers, including mechanisms for notifying primary care providers about emergency/urgent care treatment and patient discharge instructions.
- 4.4.4 Facilitate and support communication between primary care providers and community settings, including school clinics, child care centers, mental health facilities, prisons, and foster care settings.

- 4.4.5 Encourage consistent record-keeping and consider variables that affect asthma control over the calendar year (seasonality) as part of the treatment plan.

#### 4.5 Encourage a comprehensive chronic disease management approach to asthma within public, private, and community-based health care systems

- 4.5.1 Encourage a comprehensive care management approach to asthma care, including health information technology in support of high quality asthma care (*Figure 12: Health Information Technology Report Summary*).

- 4.5.2 Encourage comprehensive care management for individuals with persistent and high risk asthma. Facilitate the establishment and use of comprehensive current procedural terminology (CPT) code for comprehensive asthma care and management billing.

- 4.5.3 Promote coverage and reimbursement for the following asthma services and supplies: annual flu vaccine; smoking cessation programs; stress reduction classes and counseling for families about the impact of asthma on families; spirometry for asthma diagnosis; monitoring for individuals over four years of age; allergen sensitivity assessment (either skin tests or in-vitro blood tests); individualized asthma self-management education; relevant prevention supplies (e.g., pillow and mattress encasements); duplicate medications and spacers for children as needed (i.e., one each for home and school/child care facility use); durable medical equipment (e.g., inhaler spacers and peak flow meters); and medically necessary specialist consultations and home visits by CHWs, promotoras, and/or PHNs.



- 4.5.4 Promote provider and public awareness of the Office of the Patient Advocate, as well as consumer rights laws and regulations regarding state health plan coverage for asthma medication, devices and services, including requirements for outpatient prescription drug benefits (for inhaler spacers, nebulizers, and peak flow meters).

- 4.5.5 Educate on a model universal drug formulary that includes asthma medications and medical devices including spacers, peak flow meters, and nebulizers, and the frequency with which they can be replaced.

- 4.5.6 Educate on coverage and reimbursement for asthma self-management education and home trigger reduction services.

**Figure 12. Health Information Technology Report Summary****Potential Quality and Efficiency Benefits of Health Information Technology**

The movement toward establishing new health information technology (HIT) systems has been motivated in large part by expectations that these new technologies will improve the quality of patient care and help contain health care costs. When implemented successfully, the use of HIT should help physicians and other providers make decisions about patient care in ways that improve the quality and efficiency of care. However, successful integration will only occur if HIT is integrated into all patient encounters. In order for health information exchange to be successful, there must be commitment at the state level and coordination among all health care providers in an area.

Examples of the potential benefits are:

- Fewer unnecessary medical tests
- Higher quality patient care
- Improved emergency care outcomes
- More efficient prescription medication processing
- Fewer patient burdens, such as repetitive paperwork
- Better emergency preparedness
- Increased public health monitoring

Most efforts for health information exchange involve regional health information organizations (RHIO). A RHIO brings together health care stakeholders within a defined geographic area and governs health information exchange among them for the purpose of improving health and care in that community. This level of coordination is complex requiring buy-in at all levels of care delivery, the technology to provide the communication interface, and consistent electronic health record-keeping. RHIOs typically include a range of participating health care provider entities as well as other health stakeholders such as payers, laboratories, and public health departments, and are often managed by a board of directors comprised of representatives from each participating organization. To establish a RHIO, stakeholders must reach consensus on what information can be shared among the different participating entities, and prior to exchanging information, the various entities need to sign data use agreements. Because the capacity to effectively store and manage clinical data electronically is a prerequisite for participating in health information exchange, RHIOs often have programs to assist affiliated providers with HIT adoption at the institutional level.

Source: Promoting Health Information Technology in California: A State Policy Approach, [www.lao.ca.gov/2007/health\\_info\\_tech/health\\_info\\_tech\\_021307.aspx](http://www.lao.ca.gov/2007/health_info_tech/health_info_tech_021307.aspx)

**4.6 Increase access to high-quality asthma care for underserved populations in California by improving asthma knowledge and competency of health care practitioners, and by reducing barriers to care (e.g., cost, culture, language, health literacy, and location/distance)**

- 4.6.1 Increase the number of physicians, nurses, and physician assistants who complete nationally- or state-recognized asthma training programs, with a high priority on those working with underserved populations. Facilitate

trainings (such as PACE, NACE, and Yes, We Can) and offer continuing education credits and continuing medical education.

- 4.6.2 Work with California medical colleges and residency programs, nursing programs, respiratory therapy training programs, pharmacology programs, and physician assistant training programs to ensure that education about standards of asthma care is integrated into the curriculum, with special attention to culturally appropriate care and the needs of underserved populations.
  - 4.6.3 Increase the number of Asthma Educators-Certified (AE-C) in California, with a high priority on those working with underserved populations. Encourage public, private, and community-based health care payers to reimburse for patient education provided by AE-C.
  - 4.6.4 Establish a state promotoras/CHW certification exam on patient asthma education. Encourage public, private, and community-based health care payers to reimburse for the services of CHWs with a current certification.
  - 4.6.5 Support outreach efforts that increase availability of services to underserved populations, such as using mobile clinics, extending clinic hours, ensuring clinics are geographically accessible, etc.
  - 4.6.6 Utilize CLAS (the National Culturally and Linguistically Appropriate Services Standards) as a standard when providing care. CLAS was developed to advance health equity, improve quality and help eliminate health care disparities by establishing a blueprint for health and health care organizations.
- 4.7 Expand quality improvement for asthma care within public, private, and community-based healthcare delivery systems to assess, improve, promote, and sustain the provision of high-quality asthma care within and across systems**
- 4.7.1 Explore the potential for all health care plans in California to adopt and report on the same Healthcare Effectiveness Data and Information Set (HEDIS®) performance measures for asthma care to assess and improve performance across all plans.
  - 4.7.2 Promote recommendations for standardized/comparable and validated quality improvement measures (beyond HEDIS®) that assess and evaluate both quality of care and outcomes associated with care (e.g., emergency room visits and hospitalizations). Formulate recommendations for EHR data specifications to ensure that asthma-related measures are captured.
  - 4.7.3 Facilitate use of standardized/comparable and validated quality improvement measures (beyond HEDIS®) by public, private, and community-based health care delivery systems.

## GOAL 5 Indoor Environments

### Goal Statement

Assure that communities in California benefit from schools, child care centers, homes, and institutional facilities that meet the needs of people with asthma and provide, to the greatest extent possible, indoor spaces and adjacent environments that are free from air pollutants, allergens, and chemicals that cause or exacerbate asthma.

### Overview

Few chronic diseases are affected by environment or “place” as much as asthma. In California, people spend an average of 87 percent of their time indoors.<sup>22</sup> Exposure to asthma triggers, lung sensitivity, and severity of symptoms are influenced by where individuals live, work, attend school and child care, or otherwise spend time indoors. In some cases, these environments can also impact access to care, treatment, and management of the disease. Socioeconomic factors may limit the extent to which environmental triggers can be controlled. Policies and practices within these settings, can impact the ability of individuals to effectively control their asthma.

Goal 5 separately addresses schools, child care facilities, homes, housing, and institutional-care settings. Objectives and strategies are targeted to meet the needs of people with asthma in each distinct environment. Emphasis is placed on having appropriate policies and procedures, as well as properly trained personnel in place, to ensure the health and well-being of people with asthma. In addition, attention is focused on eliminating or substantially reducing allergens and irritants that contribute to asthma.

The 2015–2019 objectives and strategies for managing asthma in indoor environments are written for a wide audience, including (but not limited to) schools and districts, health and environmental organizations, housing stakeholders, coalitions, policymakers, funders, businesses, and concerned individuals.

### A. Schools

#### Overview

Asthma is the most common chronic disease among children, impacting the health, and academic performance of California K–12 students and imparting financial losses to schools. Twelve and a half (12.5) percent of California children under age 18 have been diagnosed with asthma; in some counties, nearly one in three students have received an asthma diagnosis.<sup>23</sup> Asthma causes about 1.4 million school absences

22 Shimer D, Phillips TJ, Jenkins PL, et al. *Indoor Air Pollution in California*. Sacramento, CA: California Environmental Protection Agency, California Air Resources Board, 2005.

23 Milet M, Lutzker L, Flattery J. *Asthma in California: A Surveillance Report*. Richmond, CA: California Department of Public Health, Environmental Health Investigations Branch, 2013.

per year, costing California K–12 public schools approximately \$37 million in lost revenue each year.<sup>24</sup> A growing body of research is finding that asthma also adversely affects student and staff performance.<sup>25</sup> Effectively addressing a multi-faceted issue such as asthma in the largest school system in the country, where over 6.8 million children spend a substantial portion of their day in one of the state’s 13,300 public and private schools, is a daunting task requiring effort and resources from all sectors. It is critical for schools and districts to identify students with asthma, reduce exposure to environmental triggers, and recognize and respond to asthma symptoms and emergencies.



Effectively managing asthma in schools requires a comprehensive and coordinated approach. Such an approach should encompass implementing ‘asthma safe’ policies and procedures at the district and school levels (*Figure 13. Best Practices for Asthma Management in Schools*); coordinating among school personnel, families, and health providers to serve students with asthma; and providing asthma education to school and district personnel. The CDC offers a model that highlights several key components to addressing asthma in the school setting (*Figure 14. Strategies for Addressing Asthma within a Coordinated School Health Program*). Districts and schools can tailor this model to suit their needs and resources.

Cuts to school funding have slowed, and in some cases reversed, progress on health and environmental achievements. For example, there have been dramatic reductions in school nurses and maintenance/facilities personnel as well as a sharp rise in the deferral of repairs and renovations to school facilities. Despite these challenges, in many instances districts and schools across California have persevered, making substantial strides in asthma control.

Measured and meaningful efforts (scaled up over time) to address asthma in the school setting will make a positive difference for students and staff with asthma. Investments in asthma management and indoor environmental quality in schools can increase the health, wellbeing, and performance of students and staff with asthma, and potentially all school occupants. It can also reduce asthma-related student absenteeism. Many practices can be implemented at little or no cost. Additionally, school districts reduce their liability when asthma is controlled, acute episodes are appropriately treated, and environmental hazards are prevented or promptly mitigated.

24 Milet, M. *Revenue Lost to California Schools Because of Asthma-Related Absences*. American Public Health Association Annual Meeting. San Francisco, CA: 2012.

25 United States Environmental Protection Agency. (January 2013). *Improved Academic Performance*. Retrieved from [www.epa.gov](http://www.epa.gov).



## Important Changes in the Last Five Years

Despite major economic challenges, significant action has taken place across California to manage asthma in the school setting through the creation of guidance documents, grassroots activism, program development, and expansion of the school health infrastructure. The following are examples of strategies implemented since publication of the 2008–2012 *Strategic Plan*.

The California School Environmental Health and Asthma Collaborative (SE-HAC), created in 2008, is a statewide workgroup focused on advancing the *Strategic Plan's* objectives and strategies for schools. It brings together diverse stakeholders from the school and health sectors to: 1) elevate the importance of asthma and indoor air quality in schools, 2) create training opportunities for school and district personnel, 3) advise school districts on asthma management and indoor environmental quality, 4) leverage resources and foster collaboration, and 5) promote the adoption of asthma policies and procedures, compliance with existing laws/regulations, and the creation of new laws/regulations.

Schools across the state are increasing their use of green cleaning products and practices. Cleaning for Asthma-Safe Schools (CLASS), a partnership between CDPH and the Green Schools Initiative, trained districts/schools on methods for purchasing safer cleaning products and reducing exposures to harmful chemicals among cleaning staff, school personnel, and students. CDPH also released *Healthy Cleaning & Asthma-Safer Schools: A How-To Guide* (2014). The guide outlines steps to help school facilities departments transition to asthma-safer products and practices. It also provides ready-to-use tools and resources to help districts make changes and promote safer cleaning successes within the school community. A companion video features California custodians and administrators' successes using the guide's strategies:

[www.cdph.ca.gov/programs/ohsep/Pages/ClassGuide.aspx](http://www.cdph.ca.gov/programs/ohsep/Pages/ClassGuide.aspx)

Many California school districts have successfully implemented best practices to manage asthma and indoor environmental quality. Fresno Unified School District, located

### The *Plan* in Action

#### How stakeholders are using the Schools objectives and strategies

"One mobile unit at different school sites, FNPs establish diagnosis, determine severity, prescribe appropriate meds, educate patient and family and refer to the specialist (Breathmobile)"

"Developed district trainings on asthma for school nurse, social workers, office staff, bus drivers, PE teachers/coaches"

"Implementation of case management guidelines for district school nurses. Incorporation of emergency response guidelines for classroom teachers and administrators"

"To support implementation of requesting asthma action plans in schools and educating the school nurses about them"

Statements provided by *Plan* contributors through focus groups and interviews. See *Acknowledgements*, page v.

### Figure 13. Best Practices for Asthma Management in Schools

Below are best practices recommended by the U.S. Centers for Disease Control and Prevention for creating safer and healthier environments for students and staff with asthma, and all school occupants. These build on *Figure 14. Strategies for Addressing Asthma within a Coordinated School Health Program*. Districts/schools can translate these practices into policies and procedures.\* Many can be implemented at little or no cost.

- 1. Establish management and support systems for asthma-safe schools. To begin this process:**
  - Identify students with asthma to ensure appropriate control and management
- 2. Provide appropriate school health services for students with asthma.**
  - Obtain individualized asthma care plans for students with diagnosed asthma
  - Standardize emergency protocols for students in respiratory distress
  - Ensure access to asthma medications; develop and implement student self-carry policy
- 3. Provide asthma education and awareness programs for students and school staff.**
  - Provide ongoing adequate staff education on asthma symptoms, triggers, and treatment
  - Provide asthma education to students with asthma
- 4. Reduce environmental triggers that can exacerbate asthma or contribute to its onset.**
  - Develop a comprehensive Indoor Air Quality Management Plan (e.g., US EPA for useful resources: [www.epa.gov/iaq/schools](http://www.epa.gov/iaq/schools))
  - Discourage use of air fresheners, and scented personal care and cleaning products
  - Choose materials (classroom supplies, arts and crafts supplies, furniture) that are free of strong odors
  - Use least toxic cleaning products (US EPA registered bleach-free alternatives and Green Seal Certified products)
  - Use integrated pest management (the least toxic treatments to effectively eliminate pests).
  - Ensure the HVAC system is maintained properly and on schedule
  - Purchase new school bus fleets or retrofit existing fleets with low-emissions technologies. Ensure compliance with diesel bus idling laws
  - Plant allergen-free or low-allergen landscaping around schools
- 5. Provide safe, enjoyable physical activity opportunities for students with asthma.**
  - Encourage full participation in physical activity when well and provide modified activities as appropriate (bad-air days, presence of asthma symptoms, recovery from asthma episode, etc.)
- 6. Coordinate school, family, and community efforts to better manage asthma symptoms and reduce school absences among students with asthma.**
  - Coordinate communication among the school, families, and health care providers
  - Partner with community agencies to leverage expertise and resources

For a full list of strategies, go to [www.cdc.gov/HealthyYouth/asthma/strategies.htm](http://www.cdc.gov/HealthyYouth/asthma/strategies.htm) and [www.epa.gov/iaq/schools](http://www.epa.gov/iaq/schools)

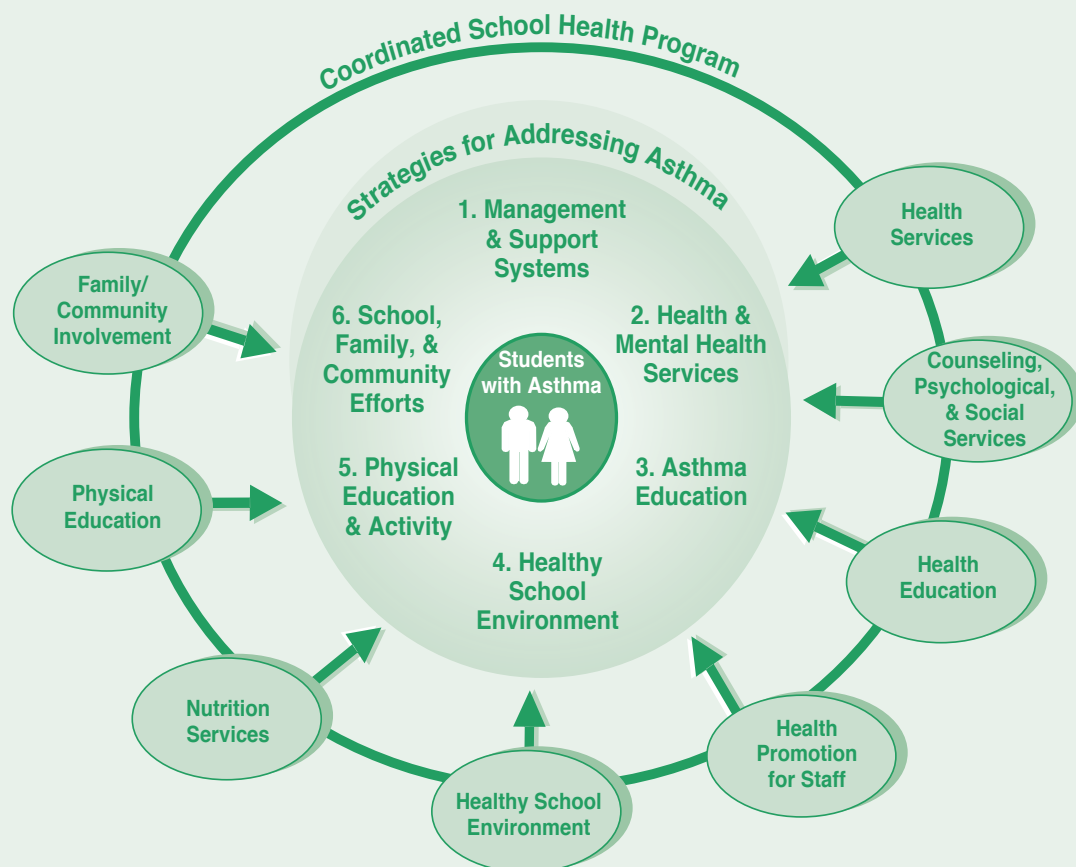
\* For off-the-shelf asthma and indoor environmental quality policies and procedures, refer to the California School Boards Association: [www.csba.org](http://www.csba.org)

**Figure 14. Strategies for Addressing Asthma within a Coordinated School Health Program**

CDC has identified the following six strategies for schools and districts to consider as they develop coordinated plans for addressing asthma in schools:

1. Establish management and support systems for asthma-friendly schools.
2. Provide appropriate school health and mental health services for students with asthma.
3. Provide asthma education and awareness programs for students and school staff.
4. Provide a safe and healthy school environment to reduce asthma triggers.
5. Provide safe, enjoyable physical education, and activity opportunities for students with asthma.
6. Coordinate school, family, and community efforts to better manage asthma symptoms and reduce school absences among students with asthma.

### Addressing Asthma within a Coordinated School Health Program



Source: [www.cdc.gov/HealthyYouth/asthma/pdf/strategies.pdf](http://www.cdc.gov/HealthyYouth/asthma/pdf/strategies.pdf)

in a region with high asthma prevalence, developed a comprehensive program to identify, monitor, and treat students with asthma. Irvine Unified School District, in Orange County, partnered with several environmental organizations to construct a state-of-the-art indoor air quality program. Hanford Elementary School, located in Kings County, which has the state’s highest asthma prevalence among children, established coordinated asthma and indoor air quality programs to address the multifaceted needs of students with asthma.



There has been a considerable rise in the number of school-based health centers across California. These centers often are operated as a partnership between the school and a community health organization, such as a health center, hospital, or local health department, and offer a range of health care services to students. When the 2008–2012 *Strategic Plan for Asthma* was released, California had 160 school health centers; today, there are 200, with 45 more under development. These centers are a vital resource for students with asthma and their families. The California School-Based Health Alliance is now exploring how it can help schools create a more supportive environment for students with asthma.

## Objectives and Strategies

### 5A.1 Facilitate the establishment and implementation of comprehensive asthma policies and procedures in districts and schools to ensure the health and well-being of students and staff with asthma

- 5A.1.1 Promote model asthma and indoor air quality policies and procedures for districts and schools (*Figure 13: Best Practices for Asthma Management in Schools*). Consult the California School Board Association for model policies and procedures for asthma and indoor air quality.
- 5A.1.2 Maintain state and local “asthma in schools” workgroups, such as the California School Environmental Health and Asthma Collaborative (SEHAC), to advance asthma and indoor environmental quality efforts in districts and schools. Encourage broad-based participation to promote a multifaceted approach.
- 5A.1.3 Encourage the adoption of protocols that emphasize full participation in physical activity for students with asthma when well, and modification of activities, when appropriate (bad air days, presence of asthma symptoms, recovery from an episode, etc.).
- 5A.1.4 Promote the adoption of healthier and environmentally preferable cleaning practices and products that reduce exposure to environmental risk factors for students and staff with asthma, including asthma triggers and asthmagens.

- 5A.1.5 Encourage the adoption of integrated pest management to reduce pests and the need for toxic pesticides throughout indoor and outdoor school environments.
  - 5A.1.6 Discuss with school maintenance/facilities personnel and construction agencies practices and specifications that reduce exposure to environmental hazards from unhealthy school operation, renovation, and construction work practices.
- 5A.2 Promote school and district implementation of, and compliance with, existing laws and regulations that impact asthma; recommend new laws/regulations or changes to existing ones as needed**
- 5A.2.1 Encourage the implementation of, and compliance with, laws and regulations that ensure asthma-safe school environments (e.g., Americans with Disabilities Act, Healthy Schools Act, California Airborne Toxic Control Measure to Limit School Bus Idling and Idling at Schools, and Asthma Medication Self-carry Law).
  - 5A.2.2 Ensure communication of changes, and new laws and regulations as appropriate, to improve asthma management and environmental quality in schools.
  - 5A.2.3 Promote inclusion of environmental and asthma health elements in the California Department of Education's School Accountability Report Cards (SARC) school safety section.
  - 5A.2.4 Update Guidelines for the Management of Asthma for California Schools (2004), developed jointly by the California Department of Public Health and the California Department of Education.
  - 5A.2.5 Promote implementation of US EPA's Voluntary School Environmental Health Guidelines for States to help districts and schools establish and sustain environmental health programs.
- 5A.3. Increase the number of qualified personnel in schools and districts to better meet the needs of students and staff with asthma and all school visitors**
- 5A.3.1 Encourage nurse-to-student ratios in school districts that more closely approach those recommended by Healthy People 2020; districts and schools should ensure all school personnel are fully trained on asthma management and emergency response.
  - 5A.3.2 Ensure that School Based Health Centers provide comprehensive asthma management and acute care for students.
  - 5A.3.3 Engage parents and community groups in providing input on asthma management and treatment in schools and districts.

- 5A.3.4 Educate about the importance of facility staffing levels that are adequate to meet the construction, renovation, and maintenance needs of schools and districts.
- 5A.4. Institute targeted and specialized trainings for district and school personnel on asthma management and indoor environmental quality in schools, to include health personnel, administrators, teachers, front office staff, coaches, maintenance/facility personnel, food preparation workers, and bus drivers**
- 5A.4.1 Utilize professional development institutes and other pre-existing opportunities to educate staff about asthma symptoms, treatment, and emergency response, and environmental trigger mitigation strategies.
- 5A.4.2 Identify and use model practice asthma and indoor environmental quality training curricula, tool kits, and other resources from credible health and environmentally-focused organizations; update resources as needed.
- 5A.4.3 Explore opportunities to integrate information on indoor environmental quality into teaching/training programs that prepare new teachers and improve the knowledge and skills of experienced teachers.
- 5A.5. Minimize exposure to contaminated outdoor air and promote safe and healthy outdoor school environments**
- 5A.5.1 Develop a protocol for managing bad-air days for children with respiratory diseases, utilizing Real-Time Air Advisory Networks or other daily air quality advisory resources. Provide viable indoor alternatives for full physical activity on bad air days.
- 5A.5.2 Promote diesel exhaust exposure reduction methods at school sites, such as retiring and/or retrofitting existing fleets with the low-emissions technologies and adhering to regulations that restrict school bus idling.
- 5A.5.3 Develop and promote guidelines on low-allergen landscaping practices for schools, utilizing resources such as the Ogren Plant Allergy Scale (OPALS™).<sup>26</sup>
- 5A.6. Support the distribution of resources to enhance asthma management and indoor environmental quality in schools**
- 5A.6.1 Encourage research on asthma in schools to better understand current needs and effective strategies for addressing asthma and indoor environmental quality in schools, and the consequences of poorly-managed asthma and indoor environmental quality in schools.
- 5A.6.2 Support a mechanism by which schools and districts in greatest need of health hazard remediation receive priority status for state funds for maintenance and renovation.

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<sup>26</sup> Allergy-Free Gardening. (2013). OPALS—*The World's First Plant-Allergy Scale*. Retrieved from [www.allergyfree-gardening.com](http://www.allergyfree-gardening.com).

- 5A.6.3 Identify opportunities to implement actions that accomplish multiple environmental quality goals (i.e., implement energy efficiency upgrades and measures that also improve indoor air quality).
- 5A.6.4 Develop initiatives that link asthma, other chronic diseases, and environmental interventions to accomplish multiple goals.

## B. Child care

### Overview

There are nearly 50,000 licensed child care centers and family child care homes in California. Approximately 146,000 adults work in these environments, serving over a million children. Many other young children attend facilities not covered under regulations that apply to licensed settings. Environmental triggers for asthma are commonly present in child care settings and some children spend up to 60 hours a week in them. Therefore it is critical that each of these settings provides a healthy and safe environment for all staff and children, especially children with special health care needs such as asthma. Knowledge about asthma varies widely among child care directors, teachers, and other child care providers.<sup>27</sup> Often, there is an inadequate understanding of how to recognize and respond to asthma symptoms, administer asthma medications, and reduce environmental asthma triggers. Some facilities are reluctant to enroll children with asthma or administer asthma medications, despite laws that protect children with asthma (*Figure 15. Legal Protections Afforded to Children with Asthma*). Building the capacity of the child care community to properly manage asthma can be a challenge given the decentralized nature of most child care, varying education levels among providers, language differences, and resource disparities among child care sites.

Nevertheless, some child care sites and child care organizations in California, including some Head Start programs, have made significant strides to better manage asthma and indoor air quality. It is vital to scale up best practices and build the capacity of the broader child care community by establishing partnerships within the child care community itself and leveraging the expertise and resources of outside organizations. Creating a safe, healthy, and supportive environment for children with asthma can increase their attendance, participation, and progress in child care and preschool.

To manage asthma properly, child care sites should strive for a multifaceted approach that includes: the adoption and implementation of best-practice asthma policies and procedures, beyond child care licensing regulations (*Figure 16: Best Practices for Managing Asthma in the Child Care Setting*); regular, sufficient, and culturally appropriate asthma education for child care providers; and ongoing communication and coordination among child care providers, families, and health care providers (starting with identification of children with asthma and preparation of an asthma care plan for each child).

<sup>27</sup> Michelle G. Goveia, Nazerah Shaikh, Gayle Windham, Oliver Bembom, Katherine Feldman, and Richard Kreutzer. *Pediatric Asthma, Allergy & Immunology*. Spring 2005, 18(1): 12-24. doi:10.1089/pai.2005.18.12.

## Figure 15. Legal Protections Afforded to Children with Asthma

### Federal Americans with Disabilities Act and Child Care

Chronic breathing problems are classified as disabilities, which mean that children with asthma are protected under the Americans with Disabilities Act (ADA). ADA states that children with disabilities cannot be excluded from child care unless their presence would pose a “direct threat” to the health or safety of others or require a fundamental alteration of the program. ADA also requires child care programs to make “reasonable modifications” to policies and practices to integrate children with disabilities. For more information on what this means, visit the Federal Department of Justice website at [www.ada.gov/childq%26a.htm](http://www.ada.gov/childq%26a.htm).

### California Law

California does have some regulations that have applicability to children with asthma and with which all licensed child care facilities must comply. Exceptions or variations for licensed family/home child care are noted where applicable.

#### Treatment, Management, and Staff Training

- Health & Safety Code, Section 1596.798, gives child care staff permission to administer inhaled medications when specific requirements are met. The code also states that any licensee or staff person who obtains or renews a pediatric first aid certificate must complete formal training in how to administer inhaled medication to children with respiratory needs.

Link to requirements: <http://cclcd.ca.gov/res/pdf/12APX06.pdf>

- Title 22 Regulations, Division 12, Section 101223, states that each child receiving services from a licensed child care facility shall have rights which include, but are not limited to the following: "To be accorded safe, healthful and comfortable accommodations, furnishings and equipment to meet his/her needs".

Link to requirement: [www.dss.cahwnet.gov/ord/entres/getinfo/pdf/ccc5.pdf](http://www.dss.cahwnet.gov/ord/entres/getinfo/pdf/ccc5.pdf)

#### Trigger Reduction

- Pest management and pesticide use: Title 22 Regulations, Division 12, Section 101238, states that licensees shall take measures to keep their child care facilities free of flies, other insects and rodents. In 2006, the Healthy Schools Act (California Education Code Section 17610-17612) was extended to licensed child care facilities. This law was designed to reduce children's exposure to pesticides by stipulating requirements on notification, posting and record keeping with regard to pesticide application. The law also requires the Department of Pesticide Regulations to send licensed child care facilities information on Integrated Pest Management (IPM). Family child care homes are exempt from the requirements, but do receive the IPM information. For more information on IPM, visit: <http://apps.cdpr.ca.gov/schoolipm/childcare/#Complying>

Link to requirements: [http://apps.cdpr.ca.gov/schoolipm/childcare/ab2865\\_faq.pdf](http://apps.cdpr.ca.gov/schoolipm/childcare/ab2865_faq.pdf)

- Smoking: Health and Safety Code, Section 1596.795, bans smoking anywhere on licensed day care premises. Family daycares are required to prohibit smoking only when children are present.

Link to requirement: <http://cclcd.ca.gov/res/pdf/12APX06.pdf>



**Figure 16. Best Practices for Managing Asthma in the Child Care Setting**

Below are six best practices for making child care sites safer and healthier for children with asthma. These recommendations can be made into policies by family day care homes and child care centers. Many of the recommendations are low cost or no cost.

- 1. Identify children with asthma and ensure that each has an individual asthma care plan prepared by the child's medical provider that includes:**
  - Written instructions on how to avoid conditions that trigger asthma symptoms
  - Names, doses, and administration of medications; expiration dates and instructions for proper storage; and date when an updated asthma care plan should be written
- 2. Ensure that caregivers receive regular training on asthma tailored to a variety of child care settings and offered in appropriate languages, including:**
  - Identifying children with asthma (including those who may not be diagnosed)
  - Reducing exposure to common triggers of asthma
  - Recognizing and responding to asthma symptoms and emergencies
  - Administering asthma medications
- 3. Provide parents with necessary medications and equipment and demonstrate proper usage.**
- 4. Properly train caregivers to promptly administer prescribed medications.**
- 5. Ensure ongoing communication between child care providers, families, and health care providers.**
- 6. Reduce exposure to common asthma triggers at the facility by:**
  - Encouraging use of allergen impermeable nap mats or crib/mattress covers
  - Reducing clutter, stuffed toys and upholstered furniture, using area rugs instead of carpeting, vacuuming carpet and upholstery often (when children are not present) with a HEPA vacuum or HEPA vacuum bags
  - Choosing non-allergenic pets, such as fish, instead of furry and feathered pets
  - Prohibiting use of air fresheners, scented soaps, personal care products, and aerosol sprays
  - Using least toxic sanitizers and disinfectants, including US EPA-registered bleach free alternatives (or at least, adopting practices that reduce exposure to bleach)
  - Choosing supplies, arts and crafts items, furniture, and toys that have no odors
  - Promptly fixing leaky plumbing or sources of excess water and promptly addressing water damage, mold and mildew
  - Cleaning up food crumbs or spilled liquids, storing food in airtight containers, and properly disposing of garbage
  - Using integrated pest management — the least toxic treatments to effectively eliminate pests
  - Posting 'No Smoking' signs prohibiting smoking within 15 feet of the facility or playground
  - Maintaining the HVAC system properly; if no HVAC system exists, encourage opening windows when safe to do so
  - Keeping children indoors and providing alternative physical activities when weather forecasts predict unhealthy ozone levels or high pollen counts

For information on healthy child care, visit: [www.cfoc.nrckids.org](http://www.cfoc.nrckids.org).

## Important Changes in the Last Five Years

Training and education resources have been developed to educate child care staff, including family child care providers, and parents of young children on how to manage asthma and mitigate triggers. Some institutional policy initiatives have been introduced, leading the way for broader public health strategies.

The *Asthma Education for Childcare and Preschool Staff* (2008) curriculum, a comprehensive manual and video that explains asthma, how to manage asthma, and how to reduce triggers in the child care setting, has been widely used across the state. The curriculum includes resources such as asthma action plans, classroom checklists, and model policies. It can be viewed online in short segments on the California Breathing website. Copies of the DVD and manual are also available. The Emergency Medical Services Authority (EMSA) has promoted use of this tool, in addition to EMSA's own asthma video and curriculum, to teach child care providers about asthma. An estimated 60,000 providers receive basic asthma education each year through *CPR and First Aid Training* and *Preventive Health & Safety Training*.

The San Francisco Asthma Task Force released a significant report, *2013 Update: Bleach-free Disinfection and Sanitizing for Child Care*, aimed at reducing exposure to bleach, a common asthma trigger. This report demonstrates how new research has changed our understanding about the risks and challenges associated with bleach. While it is well understood that bleach can trigger asthma, in recent years, research has demonstrated that bleach exposure can contribute to the onset of asthma. The report identifies alternative disinfecting and sanitizing products and infection control best practices that are safer for asthma. This is especially important in child care settings where many of the surfaces young children come into contact with are disinfected regularly.

The *Integrated Pest Management: A Toolkit for Early Care and Education Programs* (2011) curriculum offers information on health concerns related to pesticides, practical pest prevention strategies, and safer alternatives to mitigating pests. It also explains appropriate use of pesticides, when absolutely needed, that limits childhood exposures to these chemicals. The curriculum was developed by UC San Francisco School of Nursing's Childcare

## The Plan in Action

### How stakeholders are using the Child Care objectives and strategies

"With the *Plan* in mind, the Emergency Medical Services Authority (EMSA) provides asthma training to one or more staff members who work in the state's licensed child care centers and homes. We consider CDPH and its asthma program as partners in our work to improve the care of children with asthma"

"We reviewed the objectives and strategies related to child care when formulating mandated asthma curriculum to be adopted by the California Thoracic Society"

Statements provided by *Plan* contributors through focus groups and interviews. See *Acknowledgements*, page v.

Health Program, UC Berkeley's Center for Environmental Research and Children's Health, the UC Statewide IPM Program, and the California Department of Pesticide Regulation.

Through funding from California Breathing, Shasta Head Start and Child Start in Napa and Solano Counties developed *Tots Breathe Freely*, which provides environmental assessment tools for identifying and reducing asthma triggers in Head Start Centers. Child Start offers technical support to Head Start programs across California working toward implementing *Tots Breathe Freely*. This resource has been widely accepted and offers low-cost solutions to reducing asthma triggers to centers with limited budgets.

## Objectives and Strategies

### 5B.1 Support the health and well-being of children and staff with asthma in child care settings through a set of comprehensive and coordinated asthma policies and procedures

- 5B.1.1 Encourage child care sites to adopt and implement proven policies and procedures to manage asthma and indoor environmental quality (*Figure 16. Best Practices for Managing Asthma in the Child Care Setting*).
- 5B.1.2 Encourage the establishment of statewide/regional collaboratives (and/or leverage existing ones) to facilitate the adoption and implementation of model asthma policies and procedures across the child care community.
- 5B.1.3 Encourage support for child care services, child care health consultations, facilities improvements, and opportunities for staff training.

### 5B.2. Promote regular and adequate education and training opportunities for child care providers on the management of asthma and indoor environmental quality

- 5B.2.1 Build and support partnerships with organizations that can provide outreach and training opportunities for providers who work in a variety of settings (e.g., rental facilities, churches, homes, centers and schools).
- 5B.2.2 Update outreach and training materials as needed; tailor materials to providers in a variety of settings and offer in appropriate languages. English, Spanish, Chinese, Tagalog and Vietnamese are the most commonly spoken languages in California child care settings.
- 5B.2.3 Increase the hours of health and safety training required of child care providers and establish a provision to enforce child care provider compliance with health and safety training requirements.

### 5B.3. Encourage the availability of child care health consultants and health personnel to help child care providers manage asthma

- 5B.3.1 Support an increase in child care health consultants and/or nurses from local health departments and community health organizations as a training and technical assistance resource for licensed child care facilities.

- 5B.3.2 Establish partnerships between the child care, health care, and school communities to provide clinical and health education consultation services to child care sites, including unlicensed providers.
- 5B.3.3 Encourage Head Start and other child care related organizations to share effective practices and resources through a variety of forums (webinars, newsletters, training) with other child care programs.
- 5B.4. Offer to discuss laws/regulations for licensed child care facilities with the California Department of Social Services (Community Care Licensing) to ensure that these laws/regulations adequately address asthma and indoor environmental quality issues and are enforced, and that there is sufficient outreach and education about the laws/regulations**
  - 5B.4.1 Engage stakeholders in evaluating laws/regulations to address asthma and environmental quality issues in licensed child care facilities.
  - 5B.4.2 Ensure that asthma and environmental researchers and health and safety experts share new data.
- 5B.5. Minimize exposures to indoor and outdoor air contaminants in the child care setting to promote safe and healthy environments**
  - 5B.5.1 Encourage child care providers to conduct environmental assessments of their homes and centers and to reduce exposures to triggers that exacerbate or cause asthma, such as unsafe cleaning and disinfecting products, pesticides, tobacco, volatile organic compounds (VOCs), allergens (e.g., animal dander), and poor ventilation.
  - 5B.5.2 Conduct further research on indoor air exposures and mitigation strategies and develop and disseminate evidence-based policies and practices for child care settings.
  - 5B.5.3 Establish and disseminate guidance for child care sites on effective practices for recognizing unhealthy air quality days and making appropriate activity modifications for children with respiratory diseases and possibly all children.
  - 5B.5.4 Promote the use of IPM throughout the indoor and outdoor environment to reduce pests and the need for toxic pesticides.
  - 5B.5.5 Consider developing guidelines for locating new licensed child care centers as far as possible from sources of outdoor air pollution such as freeways, busy roads, agricultural exposures, and stationary pollution sources (similar to existing regulations for new school construction).
  - 5B.5.6 Promote low-allergen landscaping practices for child care settings.

## C. Healthy Housing

### Overview

Public health practitioners have long recognized the link between housing conditions and health. Scientists continue to discover and explore new conditions in the home that impact the health of the residents. Indoor air pollution and other exposures have been linked to acute and chronic disease, including asthma. There are ways to improve indoor air quality and prevent other harmful exposures in homes through policy, building and maintenance practice, and education.

Many factors related to housing, from quality to type of housing and affordability, can affect the health of people with asthma. For example, residents of multi-unit structures can be exposed to asthma triggers that originate in their neighbors' units. This includes drifting secondhand smoke, dampness and mold, pests that travel between units, and harmful pesticides that may be used by other residents and property managers. The lack of quality affordable housing can push people into unhealthy conditions that may increase exposure to asthma triggers. For instance, immigrants lacking documentation, and others with limited housing options, may be afraid to complain about poor conditions for fear of legal consequences or landlord retaliation. The result can be long term exposure to poor indoor air quality, household pests, and other allergens or irritants that pose health risks within the home.



There are many programs and projects throughout the state designed to help reduce triggers in the homes of people with asthma. These range from home visitor programs that educate people about strategies they can use to reduce triggers themselves, to important partnerships between code enforcers and health departments that seek to interpret building codes in ways that better protect health, and policy initiatives. For example, the California Department of Public Health Tobacco Control Section, and its partners, have made smoke-free multi-unit housing a priority. Many municipalities and counties in California, as well as a number of property owners, have implemented policies that limit exposure to secondhand smoke in multi-unit housing. In addition, health and housing advocates are promoting Integrated Pest Management policies and practices, an effective approach to pest elimination and control that limits the use of harmful pesticides.

Healthy Housing training is a priority activity for state and national healthy housing collaboratives and organizations. Training is key to reducing environmental asthma triggers in the home. Organizations throughout the state have provided some kind of healthy housing training program for health care providers, health outreach workers, health advocates, housing advocates, housing and building officials, environmen-

tal health agencies, code enforcement officials, and other audiences. Among others, training providers included CDPH (California Breathing Asthma Program and Childhood Lead Poisoning Prevention Branch), Los Angeles County, the City of Los Angeles, the Healthy Homes Collaborative, the City of San Diego, and Alameda County. Collectively, these organizations have provided healthy homes training in 14 of California's 58 counties.

### Important Changes in the Last Five Years

The California Healthy Housing Coalition (CHHC) formed in 2010 as a collaborative of diverse agencies, organizations, and individuals working to improve the health of housing in California by implementing effective, evidence-based practices in education, outreach, construction, and code enforcement. CHHC members advocate for housing that is developed, sited, built, and maintained in a manner that is environmentally friendly, healthy, and affordable for owners and occupants alike. Weatherization programs, the new California Green Building Code, activists, builders and local governments all offer opportunities to ensure housing meets these criteria.

Proactive inspection of multi-unit buildings, rather than complaint-based inspection, is now standard in jurisdictions like Los Angeles County, the City of Los Angeles, and the City of Sacramento. Routine inspections ensure substandard conditions are promptly identified and remediated. Partnerships between legal aid groups, code enforcement agencies, and health care clinics encourage property owners and managers, whose buildings are not currently up to code, to comply with housing laws. The Code Enforcement Work Group of CHHC is also working on initiatives in this arena, as are a variety of organizations and agencies around the state.



On a national level, the National Center for Healthy Housing (NCHH), in partnership with the American Public Health Association (APHA), developed the National Healthy Housing Standard to inform and deliver housing policies that reflect the latest understanding of the connections between housing conditions and health. The National Standard<sup>28</sup> covers seven comprehensive areas: duties of owners and occupants; structure, facilities, plumbing, and space requirements; safety and personal security; light and electrical; heating, ventilation, and energy efficiency; moisture control; and chemical and radiologic hazards.

The passage of SB 332 (2011) authorized landlords to prohibit smoking in rental housing and prohibits smoking within playgrounds. As of December 2013, 55 cities and coun-

<sup>28</sup> National Center for Healthy Housing and American Public Health Association. (June 2013). *National Healthy Housing Standard, Public Comment Version*. Retrieved from [www.nchh.org](http://www.nchh.org). (Under review at time of publication)

ties in California have passed ordinances prohibiting or limiting smoking in multi-unit housing.<sup>29</sup> The U.S. Department of Housing and Urban Development also issued a statement to all housing authorities encouraging smoke-free policies in public housing and market rate subsidized housing.<sup>30</sup> Numerous housing authorities have now adopted such policies, including some in California. Housing stakeholders emphasize that such approaches should be implemented in a way that does not jeopardize housing for highly vulnerable residents, causing homelessness and related health problems for those who have been unable to quit smoking.

In September 2011, CDPH issued a Statement on Building Dampness, Mold and Health, which recommends addressing problems by (a) identifying and correcting the source of moisture; (b) rapidly drying or removing damp materials; and (c) quickly removing or safely and thoroughly cleaning materials with visible mold.<sup>31</sup>

The California Tribal Epidemiology Center, with support from California Breathing, implemented the Tribal Asthma Survey Project, a statewide cross sectional survey of American Indians and Alaska Natives about health and housing conditions. The survey measured self-reported asthma prevalence among American Indian and Alaska Native adults, asthma morbidity and mortality, and the presence of common asthma triggers in homes. To view the full report, go to the California Breathing website: [www.californiabreathing.org](http://www.californiabreathing.org).

## Objectives and Strategies

### 5C.1 Provide education on the importance of reducing indoor environmental risk factors in housing that contribute to asthma

5C.1.1 Identify and develop educational materials and training opportunities for stakeholders about factors that contribute to poor indoor air quality and how to reduce these factors. Stakeholders include, but are not limited to: tenants, tenant rights groups, community groups, community-based orga-

## The Plan in Action

### How stakeholders are using the Housing objectives and strategies

"[To] incorporate goals into our housing (Healthy Homes) inspection design"

"[To] look at best practices and interventions in housing"

"In our scope of work with adult day care facilities"

Statements provided by *Plan* contributors through focus groups and interviews. See *Acknowledgements*, page v.

<sup>29</sup> American Lung Association in California (ALAC). *Comparison of Nonsmoking Housing Units Ordinances*. Sacramento, CA: ALAC, Center for Tobacco Policy and Organizing, 2012.

<sup>30</sup> U.S. Department of Housing and Urban Development (HUD). *Smoke-Free Policies in Public Housing*. Washington, DC: HUD, Office of Public and Indian Housing, Office of Healthy Homes and Lead Hazard Control, 2012.

<sup>31</sup> California Department of Public Health. *Statement on Building Dampness, Mold, and Health*. Sacramento, CA: California Department of Public Health, 2011; United States Environmental Protection Agency. (April 2013). A Brief Guide to Mold, Moisture, and Your Home. Retrieved from [www.epa.gov](http://www.epa.gov).

nizations, various professional associations (construction, real estate, etc.) landlords, homeowners, property managers, maintenance/facilities personnel, developers, contractors, architects, code enforcers, elected officials, insurers, and lenders (*Figure 17. Common Asthma Triggers in the Home*).

5C.1.2 Develop and implement appropriate outreach mechanisms to distribute healthy housing educational resources and information to communities and stakeholders by promoting collaborations with existing training organizations.

5C.1.3 Target dissemination of information about indoor environmental risk factors in home environments to groups and individuals identified above in 5C.1.1.

## 5C.2 Promote innovative research on asthma and housing

5C.2.1 Support organizations conducting research on building science, housing policy, the impacts of the built environment, and efforts to reduce the impacts of climate change on housing occupants (such as weatherization and green building).

5C.2.2 Promote research and assessments to find and validate health protective, evidence-based practices for reducing exposure to indoor asthma triggers.

5C.2.3 Promote research that examines the economic advantage of creating and maintaining public housing in a manner that protects the health of people with asthma.

## 5C.3 Identify, develop and promote standards, guidelines and model policies for home visits, assessments and inspections in order to minimize indoor environmental risk factors that contribute to asthma

5C.3.1 Identify and assess existing standards, guidelines, and model policies for the design, construction, renovation, and maintenance of housing to determine the adequacy of these standards to address the environmental risk factors in housing that contribute to asthma.

5C.3.2 Identify, develop and promote new standards or guidelines for the design, construction, renovation, and maintenance of housing to reduce exposures to asthma triggers (*Figure 18. Seven Principles of Healthy Housing*).

5C.3.3 Encourage the assessment of standards to determine how and to what extent they are being enforced at both the state and local level and encourage adequate infrastructure and funding for housing code enforcement.

5C.3.4 Support home construction methods aimed at reducing exposure to asthma triggers and monitor their success.

5C.3.5 Develop and promote guidance to reduce exposure to outdoor air pollution in and around homes. This includes guidance for building design practices and technologies to reduce pollutants migrating into



**Figure 17. Common Asthma Triggers in the Home**

- Secondhand and thirdhand tobacco smoke
- Indoor mold and moisture
- Cockroaches and rodents
- Dust and dust mites
- Consumer products and personal care products with chemical irritants
- Furry and feathered pets
- Combustion products (NO<sub>2</sub>) from fireplaces, wood stoves, and unvented gas appliances
- Plant pollens
- Cold air
- Indoor and outdoor air pollution from vehicles, freight transportation, and industrial sources

buildings, and land-use planning that effectively reduces or mitigates indoor pollution from major roadways and stationary sources.

5C.3.6 Develop and promote guidance for homeowners, landlords and tenants on using integrated pest management approaches to reduce exposure to pests and pesticides that can cause or exacerbate asthma.

5C.3.7 Promote efficient and cost effective means that increase the number of homes assessed and inadequate conditions remedied using proven interventions.

#### **5C.4. Promote healthy home environments for people with asthma by augmenting home assessments, remediation, and code enforcement**

5C.4.1 Encourage building inspectors to expand in-home environmental assessment practices for individuals with persistent or high-risk asthma.

5C.4.2 Target buildings where occupants have high asthma rates for education and assessment.

5C.4.3 Promote collaborations with legal aid and tenant rights organizations to increase legal support services and programs for low-income tenants with asthma who live in unhealthy housing conditions.

5C.4.4 Promote active collaboration between health care providers, code enforcers and legal aid groups to assist patients with health issues related to substandard housing conditions.

5C.4.5 Work with city and county planning, building and housing inspection departments, and other appropriate agencies to ensure that laws and enforcement practices adequately address environmental asthma risk factors.

5C.4.6 Work with city and county planning departments to add language in County General Plans that requires new multi-unit housing to include features that protect people with asthma from indoor asthma triggers.

## Figure 18. Seven Principles of Healthy Housing

In addition to the broad goals outlined in this plan for communities and stakeholders, there are many things that individuals can do to promote healthy housing. Renters, homeowners, landlords and property managers can use the Seven Principles of Healthy Housing as guideposts for reducing asthma triggers in the home environment. These principles were developed by the National Center for Healthy Housing and are used by individuals, organizations and agencies as a framework for addressing a range of issues related to health and housing.

### Seven Principles for Property Owners and Residents to Reduce Asthma Triggers and Keep Housing Healthy

Adapted from U.S. Department of Housing and Urban Development, Office of Healthy Homes and Lead Hazard Control.

#### 1. Keep it Dry

Prevent water from entering through leaks in roofing systems, and rain water from entering due to poor drainage. Check interior plumbing for any leaking. This helps prevent mold and pests that can trigger respiratory problems for residents and workers. Use safe methods for cleaning up mold. [www.epa.gov/iedmold1/moldguide.html](http://www.epa.gov/iedmold1/moldguide.html).

#### 2. Keep it Clean

Control the source of dust and contaminants by creating smooth, cleanable surfaces, reducing clutter, and using effective wet-cleaning methods. Avoid vinegar, bleach, and ammonia, which can trigger asthma symptoms. Use hydrogen peroxide and water instead of ammonia-based products.

#### 3. Keep it Safe

Avoid use of toxic chemicals. If toxic products are required, store out of the reach of children and label properly. Install smoke and carbon monoxide detectors and keep fire extinguishers on hand.

#### 4. Keep it Well-Ventilated

Ventilate bathrooms and kitchens and use whole house ventilation for supplying fresh air to reduce the concentration of contaminants in the home.

#### 5. Keep it Pest-Free

Cockroaches and rodents can trigger asthma. All pests look for food, water and shelter. Seal cracks and openings throughout the building. Store food in pest-resistant containers. If needed, use sticky-traps and baits in closed containers out of reach for children and pets. When pesticides are required, use less toxic pesticides such as boric acid powder. If professional assistance is needed to control pests, hire a licensed pest control specialist willing to provide integrated pest management services (IPM). For more information on IPM go to [www.epa.gov/pesticides/controlling/index.htm](http://www.epa.gov/pesticides/controlling/index.htm).

#### 6. Keep it Contaminant-Free

Keep the house and building smoke-free. In multi-unit buildings tobacco smoke can travel from one unit to another and trigger asthma symptoms. Reduce lead-related hazards in pre-1978 homes by fixing deteriorated paint, and keeping floors and window areas clean using a wet-cleaning approach. Eliminate use of sprayed pesticides, scented cleaning products and air fresheners.

#### 7. Keep it Well-Maintained

Inspect, clean and repair your home routinely. Take care of minor repairs and problems before they become large repairs and problems.

**5C.5. Develop projects to reduce asthma morbidity and exposure to asthma triggers in institutional care settings, such as foster and group homes, prisons, nursing homes, and mental health institutions**

5C.5.1 Discuss how to identify and mitigate asthma triggers in residential settings with the California Department of Social Services (Foster Care Branch and Community Care Licensing), the California Department of Corrections and Rehabilitation, and the California Department of State Hospitals.

5C.5.2 Provide educational resources to help care providers and health care providers in prisons, mental health facilities, and nursing homes recognize, prevent, and manage asthma among individuals under their care, and to identify and reduce indoor asthma triggers in these institutions.

5C.5.3 Support model policies and provide effective education to ensure that children living in foster care are not exposed to secondhand and third-hand smoke in the home.

## **GOAL 6 Outdoor Environments**

### **Goal Statement**

Create a healthy and safe outdoor environment for all Californians, with a focus on optimizing respiratory health.

### **Overview**

Many exposures in the outdoor environment affect people with asthma. These exposures are influenced by individual, neighborhood, community, and geographic factors that are shaped by policies, social norms, and economic conditions.

The range of outdoor exposures that trigger or cause asthma includes: air pollutants, such as diesel and other particles, nitrogen dioxide, ozone, vehicular exhaust, chemicals emitted from factories and outdoor workplaces, fireplace and wildfire smoke, and allergens such as molds or pollen. The energy sector produces particulates, sulfur oxides, nitrogen oxides, and other respiratory irritants through combustion of fossil fuels, which contribute to the mix of pollutants that adversely affect people with asthma.

There is evidence of a strong link between asthma and exposure to fine particles (PM<sub>2.5</sub> microns) in the air and to traffic emissions.<sup>32</sup> Scientists have tried to identify which chemicals in the particles are most harmful and why. Ultrafine particles, (PM 0.1 microns or smaller), are largely associated with emissions from fuel combustion, the major source of these harmful chemicals.<sup>33</sup> Ultrafine particles have negative ef-

32 Gauderman, W, et al. *Effect of exposure to traffic on lung development from 10-18 years of age: a cohort study*. The Lancet. 2006;369:571-577.

33 Bell, M. *Assessment of the Health Impacts of Particulate Matter Components*. Boston, MA: Health Effects Institute, 2012.

fects on immune function, and can penetrate the air exchange region of the lungs and deliver chemicals into the bloodstream.<sup>34</sup> These latest findings underscore the connection between short-term health impacts from fossil fuel combustion and the long-term health risks that may be associated with climate change.<sup>35</sup>

Low income and racial/ethnic minority communities are disproportionately exposed to outdoor air contaminants, which contribute to disparities in asthma prevalence and outcomes. These communities are often in areas where there are more industries, ports, and freight routes; fewer trees, parks, grocery stores, and walkable areas; as well as more substandard housing and schools, and violence. These cumulative conditions create additional health impacts for community members. Most regulatory frameworks do not take cumulative exposures into account.



The neighborhood environment and localized exposures at the neighborhood level influence the severity of asthma. Wood burning, charbroiling, and grilling elevate exposures to air pollution at the neighborhood level as do other sources of pollution, like busy roads. Outdoor air quality also influences indoor air quality, especially at the neighborhood level. For example, pollution from a local industrial facility is likely to enter nearby homes at levels much higher than homes far away.

Health Impact Assessments (HIAs) are used to determine the intended and unintended health impacts (positive and negative) of a proposed project or policy. HIAs can expose the disproportionate impact a proposed project or policy may or may not have on low-income and racial/ethnic minority communities. An HIA can be a useful tool to determine how a project or policy might affect people with asthma, determine the health “pros and cons,” and provide opportunity for community residents to voice their concerns.

The built environment can influence exposures that cause or trigger asthma. For example, dependence on the automobile due to sprawl has been associated with an increased number of vehicles, longer distances traveled, and subsequent increased traffic pollution and asthma exacerbation. Housing near high volume roadways is associated with more severe and frequent asthma attacks among the residents. The freight transportation industry — the vast numbers of diesel trucks, trains, and ships that transport goods from ports to distribution centers to stores — expose communities to large amounts of diesel pollution that pose a significant risk for people with asthma. Legislation (see Important changes in the last five years) has decreased diesel pollution around ports by approxi-

34 Li N, Harkema JR, Lewandowski RP, et al. *Ambient Ultrafine Particles Provide a Strong Adjuvant Effect in the Secondary Immune Response: Implication for Traffic Related Asthma Flares*. *American Journal of Physiology: Lung Cellular and Molecular Physiology*. 2010;299(3):L374-383.

35 Daigle C, et al. *Ultrafine Particle Deposition in Humans during Rest and Exercise*. *Inhalation Toxicology*. 2003;15:539-552.

mately 45 percent but greater reduction is needed.

Agricultural and forestry practices may increase dust and particulates or airborne pesticides in surrounding communities. The use of allergenic trees in parks, roadways, and neighborhoods creates additional exposures that can trigger asthma for some individuals. The use of non-allergenic trees is important to consider when making urban forestry decisions such as creating open space, reducing heat islands, and using tree canopy as a means of diminishing greenhouse gases (GHGs).

Increasing levels of CO<sub>2</sub> and GHG are accelerating climate change, impacting health in myriad ways. Increased pollution levels due to changes in atmospheric chemistry may affect people with asthma. Increasing temperature and the frequency and duration of extreme heat events due to climate change is projected to increase the production of ground level ozone. Flowering seasons are changing along with pollen levels. Wildfires resulting from changes in precipitation and temperature are increasing. All of these changes may affect those with asthma. In many locations, climate change will likely amplify environmental stimulation of asthma, respiratory allergies, and airway disease, resulting in more severe and frequent disease exacerbations and an increase in the overall burden of these conditions.<sup>36</sup>

## Important changes in the last five years

California has implemented policies that should aid in reducing the burden of asthma:

Transportation accounts for 38 percent of California's total greenhouse gas emissions. California has adopted a three-pronged approach to decrease these emissions: 1) through SB 375, reduce the total amount Californians have to drive, 2) cut the carbon-

## The Plan in Action

### How stakeholders are using the Outdoor Environment objectives and strategies

"Used *Strategic Plan* to get local policy makers at the county level to work with our Public Health Partner on issues related to air quality monitoring, agricultural practices around rural schools and recognition of morbidity"

"To maintain focus on clean air"

"Writing speaking points for public presentations related to air quality and public health impacts of poor air quality — *Plan* is a solid reference piece for accurate statements on California-centric issues"

"As a reference for SCAQMD staff writing about health impacts of poor air quality, as related to asthma rates in Southern California"

"Helped us to understand how our work to reduce outdoor air pollution can be better linked to broader asthma prevention and management strategies"

Statements provided by *Plan* contributors through focus groups and interviews. See *Acknowledgements*, page v.

<sup>36</sup> Portier CJ, Thigpen TK, Carter SR, et al. *A Human Health Perspective on Climate Change: A Report Outlining the Research Needs on the Human Health Effects of Climate Change*. Research Triangle Park, NC: Environmental Health Perspectives and the National Institute of Environmental Health Sciences, 2010.

intensity of the state’s fuels through the Low Carbon Fuel Standard (LCFS), and 3) increase the fuel economy of California’s vehicles. (Pavley Clean Car Standard, 2009)

The California Air Resources Board (CARB) is responsible for implementing AB 32 (Nunez, Chapter 488, Statutes of 2006) also known as the Global Warming Solutions Act of 2006, which is designed to reduce GHGs. CARB also implements SB 375 (Steinburg, Chapter 728, Statutes of 2008) also known as the Sustainable Communities and Climate Protection Act, which assigns greenhouse gas reduction targets to each of California’s 18 federally-designated metropolitan planning regions (MPOs). Each region is responsible for reducing emissions from car and light truck travel to meet CARB’s targets for 2020 and 2035.

SB 375 requires sustainable communities strategies (SCS) that maximize the “co-benefits” of emissions reduction. While MPOs and local agencies implement the SCS strategies to reduce GHG emissions, there are many opportunities to consider co-benefits that also improve social and health equity; create more walkable and bikeable communities, thus reducing local air pollution; create economic opportunity; improve public health; or preserve sensitive habitat and ecosystems. Several SCS plans include specific health objectives and metrics which address health and equity measures (e.g., reducing roadway injuries, reducing particulate emissions, and increasing the level of active transport).<sup>37</sup>



Executive Order S-1-07 (2007) enacted a low-carbon fuel standard (LCFS). The LCFS requires oil refineries and distributors to ensure that the mix of fuel they sell in the Californian market meets the established declining targets for GHG emissions. It calls for a reduction of at least 10 percent in the carbon intensity of California’s transportation fuels by 2020. These reductions include not only tailpipe emissions but also all other associated emissions from production, distribution, and use of transport fuels within the state.

On September 24, 2009, CARB adopted regulations that reduce GHG emissions in new passenger vehicles from 2009 through 2016. These are part of California’s commitment to reduce new passenger vehicle GHGs from 2012 through 2016. The Advanced Clean Cars Standard (2012), adopted by CARB for new automobiles, combines the control of smog-causing pollutants and GHG emissions into a single coordinated package of requirements for model years 2017 through 2025. The new rules will clean up gasoline and diesel-powered cars, and deliver increasing numbers of zero-emission technologies, such as full battery electric cars, newly emerging plug-in hybrid electric vehicles, and hydrogen fuel-cell cars.

<sup>37</sup> Gould S and Dervin K. *Climate Action for Health: Integrating Public Health into Climate Action Planning*. Sacramento, CA: California Department of Public Health, 2012.

CARB is guiding an effort to develop a Sustainable Freight Transport Initiative that will outline the steps to make California's freight transport system more efficient and sustainable. Criteria pollutant and GHG emissions from freight transport and related mobile sources are significant contributors to California's air quality and climate change challenges. Meeting federal ambient air quality standards and California's climate change goals requires technology transformation on all levels. This complements other planning efforts at the state and local level, such as the California Department of Transportation's (Caltrans) California Transportation Plan 2040 (CTP 2040). The CTP's purpose is to provide a common policy framework that will identify the statewide transportation system needed to achieve maximum feasible GHG emission reductions while meeting the state's transportation needs.



In West Oakland, 22,000 residents live beside three freeways, two rail yards, and the nation's fifth busiest container port — a destination for thousands of diesel trucks hauling goods back and forth daily. Data from a CARB health risk assessment for this community indicated an excess of cancer deaths and increased hospital admissions for cardiovascular and respiratory disease, including asthma. Beginning in January 2010, CARB banned all 1993 and older drayage trucks from ports and rail yards statewide. Measurements taken before the beginning of the program and then again in June 2010 after the new program was in effect showed an almost 50 percent reduction in black smoke (also called black soot — a major component of diesel particulate matter emission). They also showed a reduction of nitrogen oxide emissions by approximately 45 percent. A recent study suggests that the reduction in black soot from cuts in diesel-powered trucks, buses and other vehicles has resulted in better air quality and has a huge co-benefit in mitigating climate change.<sup>38</sup>

Chancellors at all University of California campuses across the state have implemented the University's new smoke-free policy. The University bans both smoking and chewing tobacco on campuses, including parking lots and housing, as part of its commitment to cut tobacco use and exposure to secondhand smoke. The sale and advertising of tobacco products is also prohibited. The California State University campuses are following suit.

<sup>38</sup> Bennett D. *Indoor Environmental Quality and Heating, Ventilating, and Air Conditioning Survey of Small and Medium Size Commercial Buildings*. Davis/Berkeley, CA: University of California Davis/Lawrence Berkeley National Laboratory, 2011.

## Objectives and Strategies

### 6.1 Support policies that reduce outdoor exposures that contribute to asthma in the community and the outdoor workplace

- 6.1.1 Promote HIAs and adherence to the Health in all Policies executive order to ensure that health considerations are included when making decisions and setting policies that might impact people with asthma.<sup>39</sup>
- 6.1.2 Increase awareness of and participation in decisions at all levels by cultivating leadership in pollution-affected communities, and by identifying and partnering with current asthma stakeholders, including environmental justice organizations and existing coalitions.

### 6.2 Promote research about outdoor exposures and asthma

- 6.2.1 Support research examining the connection between asthma and global warming and support mitigations to reduce GHGs that also maximize health co-benefits.
- 6.2.2 Support research focused on identifying high-use pesticides that can cause or exacerbate asthma, developing alternatives to their use, and reducing use when possible.
- 6.2.3 Support research on the acute and long term impacts of wildfires on asthma and other respiratory disease.
- 6.2.4 Support research focused on mitigations, such as high-efficiency filtration for exposures to traffic-related pollutants, and link to other exposure-reduction efforts.
- 6.2.5 Support research on improving surveillance regarding asthma and outdoor exposures.
- 6.2.6 Support research on reducing neighborhood-level exposures.
- 6.2.7 Support efforts that link research to mitigation strategies for outdoor exposure reduction

### 6.3 Increase outreach and education on outdoor exposures and asthma

- 6.3.1 Develop fact sheets about outdoor exposures and asthma for multiple literacy levels, languages, and cultures.
- 6.3.2 Promote air districts who supply real-time air advisory information through web-based systems.
- 6.3.3 Expand availability of real-time information about outdoor exposures and asthma through the use of social media, email, and texting.

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<sup>39</sup> Health in all Policies Executive Order S-04-10; December 2010.



- 6.3.4 Identify community role models, opinion leaders, and celebrities who will convey messages about outdoor exposures and asthma.
- 6.3.5 Collaborate with current asthma stakeholders when disseminating information about asthma and ways to reduce risk by reducing exposures and avoiding asthma triggers.
- 6.3.6 Encourage outreach and education to stakeholders about associations between outdoor exposures and asthma.
- 6.3.7 Increase public education to reduce use of wood-burning stoves and fireplaces.
- 6.3.8 Expand awareness of community planning and land use concepts that can decrease exposures for individuals with asthma, such as buffer zones, zoning, and pollution relocation and removal.
- 6.3.9 Include workers' exposures in the outdoor workplace in outreach efforts.

#### 6.4 Support efforts to reduce asthma triggers in the built environment<sup>40</sup>

- 6.4.1 Support the development of a cleaner freight transport infrastructure with cleaner truck fleets, ports, and rail yards through a variety of education efforts.
- 6.4.2 Support zero-emissions vehicle production and use, as well as the infrastructure needed such as compressed natural gas stations and electric charging stations.
- 6.4.3 Support healthy community planning and SCS with attention to minimizing any potential exposures to future residents and reducing pollution levels for current residents, including the following: infill efforts (the re-use of land or existing developed sites); transit oriented development; active transportation (including rails to trails); the use of buffer zones between emissions producing industry and homes, schools, and other institutions; land use zoning to determine where new industry should be placed, and pollution relocation and removal, if appropriate.
- 6.4.4 Support clean energy programs like Kyoto USA, US EPA's state and local climate and energy programs, solar energy programs, and other programs designed to reduce GHGs.
- 6.4.5 Decrease exposure to particulates by supporting alternatives to agricultural burning, such as chipping programs, and re-examining forest burning practices.

<sup>40</sup> Built environment is defined as "the human-made space in which people live, work, and recreate on a day-to-day basis. The built environment encompasses places and spaces created or modified by people including buildings, parks, and transportation systems." In recent years, public health research has expanded the definition of built environment to include healthy food access, community gardens, walkability, and bikeability. Roof K and Oleru N. *Seattle and King County's Push for the Built Environment*. *J Environ Health*. 2008;71:24–27.

- 6.4.6 Identify and target outdoor occupations associated with exposures that can potentially cause or exacerbate asthma, such as lawn care and landscaping.
- 6.4.7 Support efforts to expand public transportation plans that utilize 'green technology,' 'electric technology,' and 'clean energy' vehicles that produce less air pollutants.
- 6.4.8 Support zero-emission lawn care by advocating for use of leaf blowers that produce fewer ultrafine hydrocarbon particles from engine exhaust.
- 6.4.9 Support the ongoing study of GHG reductions and health benefits from increasing active transportation (Maizlish, 2011).
- 6.4.10 Support the use of Leadership in Energy and Environmental Design (LEED)<sup>41</sup> and Green Building certification in building design and construction, and encourage LEED to incorporate the use of OPALS™, (Ogren Plant Allergy Scale),<sup>42</sup> to design low-allergy landscaping.
- 6.4.11 Promote local production/consumption options, particularly in agriculture, to reduce goods-movement miles traveled.
- 6.4.12 Support community violence-reduction efforts.
- 6.4.13 Promote health considerations when revising the California General Plan Guidelines and in local General Plan updates, to include GHG reduction, climate adaptation, public health, regional planning, and livable communities.

## **6.5 Reduce asthma outcome disparities and advance the principles of environmental justice by promoting equal protection from exposures for people with asthma**

- 6.5.1 Support the use of HIAs and environmental justice screening tools (such as the health disparities enviro-screen) to identify communities that are disproportionately affected by air pollution from nearby sources such as industry, airports, mobile sources, and agricultural lands.
- 6.5.2 Develop coordinated strategies in identified communities that address disproportionate exposure through participatory research and interventions that raise awareness, support community coalitions, and build policy efforts focused on eliminating those disparities.
- 6.5.3 Utilize funding from CARB, Caltrans, and other agencies that have set aside funding for environmental justice communities.
- 6.5.4 Support efforts to take cumulative exposures and impacts into account in policy setting and the regulatory framework.
- 6.5.5 Promote funding to support environmental strategies that reduce the burden of asthma.

<sup>41</sup> [www.usgbc.org](http://www.usgbc.org)

<sup>42</sup> *Allergy-Free Gardening*. (2013). OPALS—The World's First Plant-Allergy Scale. Retrieved from [www.allergyfree-gardening.com](http://www.allergyfree-gardening.com).

## Appendices

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## Acronyms

- ACA (or PPACA)** Patient Protection and Affordable Care Act ([www.hhs.gov/healthcare/rights](http://www.hhs.gov/healthcare/rights))
- AE-C** Asthma Educator-Certified
- ALAC** American Lung Association in California ([www.lung.org/california](http://www.lung.org/california))
- ADA** Americans with Disabilities Act ([www.dol.gov/dol/topic/disability/ada.htm](http://www.dol.gov/dol/topic/disability/ada.htm))
- ACBS** Asthma Call-Back Survey
- AQMD** Air Quality Management District
- BRFSS** Behavioral Risk Factor Surveillance System ([www.cdc.gov/brfss](http://www.cdc.gov/brfss))
- Cal/OSHA** California Occupational Safety and Health Administration ([www.dir.ca.gov/dosh](http://www.dir.ca.gov/dosh))
- CAP** California Asthma Partners ([www.asthmapartners.org](http://www.asthmapartners.org))
- CARB** California Air Resources Board ([www.arb.ca.gov](http://www.arb.ca.gov))
- CDC** Centers for Disease Control and Prevention ([www.CDC.gov](http://www.CDC.gov))
- CDPH** California Department of Public Health ([www.cdph.ca.gov](http://www.cdph.ca.gov))
- CHIS** California Health Interview Survey ([www.chis.ucla.edu](http://www.chis.ucla.edu))
- CHW** Community health worker
- CLASS** Cleaning for Asthma-Safe Schools ([www.cdph.ca.gov/programs/ohsep/Pages/class.aspx](http://www.cdph.ca.gov/programs/ohsep/Pages/class.aspx))
- COPD** Chronic obstructive pulmonary disease
- CPT** Current Procedural Terminology
- DFR** Doctor's First Report of Occupational Injury or Illness
- ED** Emergency department/Emergency room
- EHR** Electronic health record
- EMSA** Emergency Medical Services Authority
- EMT** Emergency medical technician
- GHG** Greenhouse gases
- HEDIS®** Healthcare Effectiveness Data and Information Set ([www.ncqa.org/HEDISQualityMeasurement.aspx](http://www.ncqa.org/HEDISQualityMeasurement.aspx))

- HIT** Health information technology
- HVAC** Heating, ventilation, and air conditioning
- IIPP** Illness and Injury Prevention Programs ([www.dir.ca.gov/Title8/3203.html](http://www.dir.ca.gov/Title8/3203.html))
- IPM** Integrated pest management
- NAEPP** National Asthma Education and Prevention Program ([www.nhlbi.nih.gov/about/naepp/index.htm](http://www.nhlbi.nih.gov/about/naepp/index.htm))
- NHLBI** National Heart, Lung, and Blood Institute ([www.nhlbi.nih.gov](http://www.nhlbi.nih.gov)).
- OPALS™** Ogren Plant Allergy Scale
- OSHPD** Office of Statewide Health Planning and Development ([www.oshpd.ca.gov](http://www.oshpd.ca.gov))
- QI** Quality improvement
- RAMP** Regional Asthma Management & Prevention ([www.rampasthma.org](http://www.rampasthma.org))
- SARC** School Accountability Report Cards
- SBHC** School-based health center
- SCAQMD** South Coast Air Quality Management District ([www.aqmd.gov](http://www.aqmd.gov))
- SCS** Sustainable Community Strategies
- SEHAC** School Environmental Health and Asthma Collaborative ([www.sehac.org](http://www.sehac.org))
- UC** University of California ([www.universityofcalifornia.edu](http://www.universityofcalifornia.edu))
- US EPA** Environmental Protection Agency ([www.epa.gov](http://www.epa.gov))
- VOC** Volatile organic compound
- WCIS** Workers' Compensation Information System ([www.dir.ca.gov/dwc/wcis.htm](http://www.dir.ca.gov/dwc/wcis.htm))
- WRA** Work-related asthma

## Glossary

**Acute** Brief (days to weeks); sudden.

**Air quality management plan** Policies and practices in schools that require ongoing monitoring of indoor environmental quality, steps to improve air quality, and strategies to mitigate factor contributing to poor air quality.

**Allergens** Any substance, most often eaten or inhaled, that is recognized by the immune system and causes an allergic reaction. Dust, pollen and pet dander are all common allergens.

**Americans with Disabilities Act (ADA)** Prohibits discrimination and ensures equal opportunity for persons with disabilities in employment, state and local government services, public accommodations, commercial facilities, and transportation.

**Anti-inflammatory** Inhibiting one or more of the components of the inflammatory reaction.

**Asthma** A chronic disease of the airways that has three components. First, there is inflammation in the lining of the airways that causes them to swell. Second, there is muscle constriction around the airways that, along with the inflammation, makes the airway passage narrower. Third, there is increased mucous production that blocks the flow of air through the airways. As a result, asthma causes recurrent and distressing episodes of wheezing, breathlessness, chest tightness, and nighttime or early morning coughing.

**Asthma action plan** A list of specific instructions drawn up by a health care professional for a person with asthma to follow at home, school, work, etc. An asthma action plan includes a normal schedule for asthma medicines, as well as what to do if peak flow readings or asthma symptoms worsen. Asthma action plans are usually split into Zones: Green Zone, Yellow Zone, and Red Zone.

**Asthma Call-Back Survey (ACBS)** A follow-up survey to the BRFSS survey that asks people with asthma detailed questions about asthma symptoms, health care utilization, knowledge of asthma, environmental factors, medications, costs, and other topics.

**Asthma-friendly** Policies and practices that make environments safe and supportive for people with asthma.

**Asthma management** A comprehensive approach to achieving and maintaining control of asthma. It includes patient education to develop a partnership in management, assessing and monitoring severity, avoiding or controlling asthma triggers, establishing plans for medication and management of exacerbations, and regular follow-up care.

**Asthma medication self-carry law** A California law permitting any pupil who is required to take asthma medication prescribed for him or her by a physician to carry and self-administer inhaled asthma medication if the school district receives the appropriate written statements from the physician and parent.

**Asthmagen** A substance capable of causing new-onset asthma, as designated by the Association of Occupational and Environmental Clinics in accordance with published, standardized criteria.

**Behavioral Risk Factor Surveillance System (BRFSS)** An ongoing telephone survey that was developed and conducted to monitor state-level prevalence of the major behavioral risks among adults associated with premature morbidity and mortality. The basic philosophy is to collect data on actual behaviors (rather than on attitudes or knowledge) that would be especially useful for planning, initiating, supporting, and evaluating health promotion and disease prevention programs.

**Biomarkers** Chemicals or biochemical agents measured in bodily tissue that correlate with exposure and the risk or progression of a disease, or with the susceptibility of the individual to disease.

**Breathmobile** A mobile treatment center that brings free asthma treatment and medications to students in public schools.

**Bronchodilator** A medicine that relaxes the smooth muscles of the airways. This allows the airway to open up (to dilate) since the muscles are not squeezing it shut. Bronchodilator medicines do not help inflammation.

**California Diesel School Bus Idling Regulation** A statewide regulation limiting school bus idling to no more than 30 seconds when within 100 feet of a school.

**California Health Interview Survey (CHIS)** The largest telephone survey in the United States, surveying 55,000 households in California, focusing on public health and access to health care.

**Causal factors** Risk factors that sensitize the airways and cause the onset of asthma. The most important of these factors are allergens and chemical sensitizers.

**Chronic** Remains for several years, possibly a lifetime.

**Cleaning for Asthma Safe Schools (CLASS)** A partnership between the Green Schools Initiative and the California Department of Public Health Occupational Health Branch focused on promoting asthma-safe cleaning practices in schools.

**Clinical** Relating to the medical treatment that is given to patients in hospitals, clinics, etc.



**Collaboratives** Groups of individuals coming together to work with another person or group in order to achieve or do something.

**Community health worker (CHW)** A frontline public health worker who is a trusted member of and/or has an unusually close understanding of the community served. This trusting relationship enables the CHW to serve as a liaison/link/intermediary between health/social services and the community to facilitate access to services and improve the quality and cultural competence of service delivery.

**Co-morbidity** The simultaneous presence of two chronic diseases or conditions in a patient.

**Compliance** Doing what has been asked or ordered, like regularly taking medication as prescribed.

**Compressed natural gas** A substitute for gasoline (petrol) or diesel fuel. It is considered to be an environmentally “clean” alternative to those fuels. It is made by compressing methane extracted from natural gas.

**Contaminant** Biological, chemical, physical, or radiological substance (normally absent in the environment) which, in sufficient concentration, can adversely affect living organisms through air, water, soil, and/or food.

**Contributing factors** Risk factors that either augment the likelihood of asthma developing upon exposure to a risk factor or may even increase susceptibility to asthma.

**Controller medications** Medications taken daily on a long-term basis that are useful in getting persistent asthma under control and in maintaining control. They include inhaled corticosteroids, long-acting bronchodilators, and leukotriene modifiers. Anti-inflammatory agents, particularly inhaled corticosteroids, are at present the most effective controller medications. Controller medications are also sometimes called prophylactic, preventive, regular preventive, or maintenance medications.

**Coordinated School Health Program** CDC initiative that integrates health services and practices that support student and staff well being into K-12 schools.

**Corticosteroids** A type of medicine used to reduce inflammation. Corticosteroid drugs mimic a substance produced naturally by the adrenal glands. In asthma, corticosteroids are often taken through an inhaler for long-term control. They may also be taken orally or given intravenously for a short time, if asthma symptoms get out of control.

**Current Procedural Terminology (CPT)** The list maintained by the American Medical Association to provide unique billing codes for health care services rendered.

**Disparities** When a health outcome that is seen to a greater extent in a given population.

**Doctor’s First Report of Occupational Injury or Illness (DFR)** Required by Labor code Section 6409(a) — all health care providers in California must submit a DFR when they suspect an injury or illness may be work-related. They submit it to the insurer of the employer, or directly to the employer, if self-insured. The insurer then submits a copy to the Department of Industrial Relations.

**Dust mites** Very tiny creatures (microscopic or just barely visible) that live in the dust in people’s homes. They are present both in visible dust (under the bed or behind the couch, for example) and in soft places like pillows, mattresses, blankets, and stuffed animals. They thrive especially when the air is humid. Many people are allergic to dust mites, and trying to reduce the number of them in the home is part of many asthma control plans.

**Electronic health record (EHR)** A digital version of a patient’s paper chart. EHRs are real-time, patient-centered records that make information available instantly and securely to authorized users.

**Environmental exposure** The presence of a toxicant in the immediate environment of a person; for respiratory agents, this is the product of air concentration and the amount of time spent in the environment.

**Environmental hazard** Factors that threaten the indoor or outdoor environment and adversely affect people’s health.

**Environmentally preferable cleaning practices** Practices that are not harmful to the environment, generally referring to use of ecologically-safe products.

**Epidemiology** The study of the distribution and determinants of health-related states or events in specified populations, and the application of this study to the control of health problems.

**Episode (Asthma)** Experiencing asthma symptoms such as wheezing, shortness of breath, chest tightness, and coughing.

**Exacerbate** To aggravate or make worse. “Exacerbate” replaces the words “cause,” “precipitate,” “induce,” and “incite.”

**Exacerbation** Any worsening of asthma. Onset can be acute and sudden, or gradual over several days. A correlation between symptoms and peak flow is not necessarily found. “Exacerbation” replaces the words “attack” and “episode.”

**Extreme heat event** The U.S. Environmental Protection Agency defines extreme heat events as “periods of summertime weather that are substantially hotter and/or more humid than typical for a given location at that time of year.”

**Family child care** Children are cared for in the child care providers’ own home

**Grassroots activism** Movements that are often begun at the local level, as many volunteers in the community give their time to support a local policy or shared ideal.

**Green building** The practices of design, construction and operation of buildings to provide optimal performance while reducing energy and resource use, environmental impacts and occupant health risks.

**Green cleaning** Using cleaning methods and products with environmentally friendly ingredients designed to preserve human health and environmental quality.

**Green Seal** A non-profit environmental standard development and certification organization. They certify cleaning products.

**Greenhouse gases (GHG)** The primary greenhouse gases in the Earth's atmosphere are water vapor, carbon dioxide, methane, nitrous oxide, and ozone.

**Head Start** A program of the United States Department of Health and Human Services that provides comprehensive education, health, nutrition, and parent involvement services to low-income children and their families.

**Health Exchanges** Entities that create a marketplace where individuals can purchase qualified health plans that have been certified by the exchange. States can design their insurance marketplaces by administering their own exchanges, working in partnership with the federal government, or allow the federal government to set up and operate exchanges on behalf of the state.

**Health Impact Assessment (HIA)** A systematic process that uses an array of data sources and analytic methods and considers input from stakeholders to determine the potential effects of a proposed policy, plan, program, or project on the health of a population and the distribution of those effects within the population. HIA provides recommendations on monitoring and managing those effects.

**Health in All Policies** A collaborative approach that has been used internationally to address complex problems that are multi-factorial with many interdependencies, difficult to fully define, lacking a clear solution, and not the responsibility of any single organization or government department. A HiAP approach recognizes that health and prevention are impacted by policies that are managed by non-health government and non-government entities, and that many strategies that improve health will also help to meet the policy objectives of other agencies.

**Healthcare Effectiveness Data and Information Set (HEDIS®)** A set of standardized performance measures designed to ensure that purchasers and consumers have the information they need to reliably compare the performance of managed health care plans.

**Healthy homes programs** Effort to reduce environmental hazards and includes partnerships and interagency agreements with a wide-variety of public and private organizations on the federal, state, and local level.

**Healthy People 2020** A set of health objectives for the nation to achieve by 2020. It can be used by many different people, states, communities, professional organizations, and others to help them develop programs to improve health.

**Healthy Schools Act** Enacted in January 2001, the Act put into place right-to-know requirements such as notification, posting, and recordkeeping for pesticides used at schools; and also put into code Department of Pesticide Regulation's existing school integrated pest management program and new, more detailed pesticide use reporting.

**HEPA filter** High-efficiency particulate air filter used on ventilation systems and vacuum cleaners.

**Illness Injury Prevention Programs** Universal interventions that can substantially reduce the number and severity of workplace injuries and alleviate the associated financial burdens on U.S. workplaces. Many states have requirements or voluntary guidelines for workplace injury and illness prevention programs. Most successful injury and illness prevention programs are based on a common set of key elements. These include: management leadership, worker participation, hazard identification, hazard prevention and control, education and training, and program evaluation and improvement.

**Indoor environmental quality** Includes Indoor Air Quality as well as other physical and psychological aspects of life indoors (e.g., lighting, visual quality, acoustics, and thermal comfort).

**Inhaled corticosteroid** Anti-inflammatory medicine breathed directly into the lungs. The advantage to this is that the medicine goes directly to where the inflammation is, and has minimal effects on the rest of the body (and therefore fewer side effects than corticosteroids taken orally).

**Integrated pest management (IPM)** The practice of using the least hazardous treatments first and progressing to more toxic treatments, only as necessary, to eliminate indoor and outdoor pests.

**Irritant** Risk factor or trigger that may cause increased symptoms and/or airflow limitation via a neural pathway; a non-allergic substance that may provoke a reaction in the airways.

**Leukotriene** A type of chemical involved in inflammation. Leukotrienes seem to play a particularly important role in the inflammation associated with asthma. Recently some asthma medicines have been developed that work to reduce leukotrienes or their effects (these are called "leukotriene modifiers" or "leukotriene inhibitors").

**Licensed child care** All references to child care centers and family child care in the plan include private and public child care facilities located in stand-alone centers, schools, homes, churches, workplaces, and group homes. These facilities are covered under regulations referenced.

**Life course approach** Also known as the life course perspective or life course theory, refers to an approach developed for analyzing people's lives within structural, social, and cultural contexts. For example, how early events in a person's life influence future decisions and events.

**Medi-Cal** California's Medicaid program. Medicaid is a jointly-funded, federal-state health insurance program for certain low-income and needy people. It covers children, the aged, blind, and/or disabled, and people who are eligible to receive federally assisted income maintenance payments.

**Metropolitan Planning Organizations** A federally mandated and federally funded transportation policy-making organization in the United States made up of representatives from local government and governmental transportation authorities.

**Model policies and procedures** Policies and procedures that have been identified as best practice and can be adopted by others.

**Morbidity and mortality** Sickness and death. These words are usually used when looking at the effects of a disease in a population. For example, "asthma causes significant morbidity in this group" means "asthma makes a lot of people in this group sick;" Asthma mortality in this country is unacceptable;" means "It is unacceptable if anyone in this country dies of asthma."

**National Asthma Education and Prevention Program (NAEPP)** Initiated in March 1989 to address the growing problem of asthma in the United States, and administered and coordinated by the National Heart, Lung, and Blood Institute (NHLBI). The NAEPP works with intermediaries including major medical associations, voluntary health organizations, and community programs to educate patients, health professionals, and the public. The ultimate goal of the NAEPP is to enhance the quality of life for patients with asthma and decrease asthma-related morbidity and mortality.

**Nebulizer** A device for getting medicine into the lungs. A nebulizer makes a mixture of liquid medicine and water into a mist that a person then inhales (through a mask or a mouthpiece).

**Ogren Plant Allergy Scale (OPALS)** A tool to measure the allergy potential of all garden and landscape plants.

**Ozone** An odorless, colorless gas. Ground-level ozone is found close to Earth's surface and is a serious pollutant and a main component of smog.

**Particulate matter** A generic term used to describe a complex group of air pollutants that vary in size and composition.

**Particulates** A complex mixture of extremely small particles and liquid droplets. Particle pollution is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles.

**Patient-centered medical home** A team based health care delivery model led by a physician that provides comprehensive and continuous medical care to patients with the goal of obtaining maximized health outcomes

**Patient education (asthma)** Education on specific asthma management skills such as how to take medicine correctly, how to recognize when asthma gets worse, and what actions to take to achieve and maintain control.

**Peak flow meter** A device to measure how hard and fast a person can blowout air. This is an indication of how well the lungs and airways are doing. A peak flow meter is an important part of an asthma home-monitoring plan.

**Pesticides** A pesticide is generally a chemical or biological agent (such as a virus, bacterium, antimicrobial or disinfectant) that through its effect deters, incapacitates, kills or otherwise discourages pests.

**Pharmacotherapy** Treatment of a disease or health condition with drugs.

**Promotoras/Promotores** Lay Hispanic/Latino community members who receive specialized training to provide basic health education in the community although they are not professional health care workers. While most of their work entails educating target audiences about health issues affecting their community, they also provide guidance in accessing community resources associated with health care.

**Protocols** A system of rules that explain the correct conduct and procedures to be followed in formal situations.

**Quality improvement (QI)** A method of evaluating and improving processes of patient care which emphasizes a multidisciplinary approach to problem solving, and focuses not on individuals, but systems of patient care which might be the cause of variations.

**Reasonable modification** Changes that can be carried out without much difficulty or expense to accommodate a child with special needs in child care settings. This is individual to each program depending upon nature of the modification, cost and resources of the program.

**Respiratory distress** Difficulty breathing.

**Risk factor** An agent that when present increases the probability of disorder expression. There are two types of risk factors:

- Risk factors involved in the development of the condition of asthma. For example, a risk factor for the onset of asthma can be inherited, such as atopy. Alternatively, a risk factor can be due to environmental exposure. See “causal factors” and “contributing factors.”
- Risk factors that cause asthma exacerbations in individuals who already have the condition. These are also called triggers.

**School Accountability Report Cards (SARC)** SARCs predominantly contain academic and fiscal elements, but they are also required to include information on school facilities and safety. State law requires school districts to provide them annually.

**School-based Health Center (SBHC)** Primary care clinics based on primary and secondary school campuses in the United States. Most SBHCs provide a combination of primary care, mental health care, substance abuse counseling, case management, dental health, nutrition education, health education and health promotion. An emphasis is placed on prevention and early intervention. SBHCs generally operate as a partnership between the school district and a community health organization, such as a community health center, hospital, or the local health department.

**School Health Council** An advisory group, generally consisting of health professionals, that informs and advocates for health-related policies and practices in schools or districts.

**Self-carry** A California law that allows students to carry and administer their own inhaled asthma medication with health care provider and parent permission.

**Severity** How bad or serious a disease is. In asthma, severity is generally broken up into four categories: mild intermittent, mild persistent, moderate persistent and severe persistent.

**Spacer** A device usually consisting of a plastic chamber that attaches to a metered dose inhaler on one end, with a mouthpiece on the other end. A spacer is intended to help get medicine from a metered dose inhaler into the lungs.

**Spirometry** A method of measuring various components of airflow and used to diagnose asthma.

**Stakeholder** For the purposes of this report, this term refers to state and local health departments, public health agencies, asthma organizations and coalitions, health care providers, health care delivery organizations, academic and research institutions, child care centers, schools, institutional settings, policymakers, legislators, business sectors, and all communities and individuals within California that have an interest in the problem of asthma.

**Surveillance** The continuous, systematic collection, analysis and interpretation of health-related data needed for the planning, implementation, and evaluation of public health practice.

**Sustainable Community Strategies (SCS)** The SCS lays out how the region will meet greenhouse gas reduction targets set by the California Air Resources Board (CARB).

**Symptom** A physical or mental feature that is regarded as indicating a condition of disease, particularly such a feature that is apparent to the patient. Asthma symptoms can include coughing, wheezing and chest tightness.

**Synergistic** Two or more groups working together so the total effect is greater than the sum of the parts.

**Title 22** California regulations for licensed child care facilities.

**Translational research** The conversion of findings from basic, clinical, or epidemiologic environmental health science research into information, resources, or tools that can be applied by health care providers and community residents to improve public health outcomes in at-risk neighborhoods.

**Trigger** A risk factor that causes exacerbations of asthma; a stimulus that causes an increase in asthma symptoms and/or airflow limitation.

**US EPA Voluntary School Environmental Health Guidelines (also known as State School Environmental Guidelines)** Recommendations, case studies, and resources that help states establish and sustain environmental health programs for K-12 schools.

**VOC (volatile organic compound)** Gases from certain solids or liquids. VOCs include a variety of chemicals, some of which may have short- and long-term adverse health effects. Examples include: paints and lacquers, paint strippers, cleaning supplies, pesticides, building materials and furnishings, office equipment such as copiers and printers, craft materials including glues and adhesives, and permanent markers.

**Work-related asthma (WRA)** Asthma caused or triggered by conditions or substances in the workplace.







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