Strategic Plan for Asthma in California

2008–2012

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CDPH California Department of PublicHealth

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Executive Summary

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. The effects of poorly controlled asthma include missed school and work days, disruption of sleep and daily activities, urgent medical visits for asthma exacerbations, and even death. Over five million Californians have been diagnosed with asthma at some point in their lives, and almost three million currently have asthma. The health care costs of asthma are enormous — hospitalizations alone totaled over $763 million in 2005. Blacks, children, and low-income communities bear an undue proportion of these burdens associated with asthma. Rates of emergency department (ED) visits, hospitalizations, and mortality are two to three times higher among Blacks than other racial and ethnic groups.

While there is no cure for asthma, there are a variety of medical and environmental interventions and policies that can help people prevent asthma and control its symptoms so as to have a minimal effect on peoples' daily lives. This *Plan* outlines steps to reduce the impact of asthma on Californians.

This *Plan* builds upon considerable work over the last five years to implement the *2002 Strategic Plan for Asthma in California*. This revised *Plan* includes specific goals and objectives in the areas of building infrastructure to address asthma: surveillance and research, health care, and indoor and outdoor environments.

The *Plan* is designed to help state agencies, health organizations, and members of the community develop work plans for addressing asthma. While using this *Plan*, five important cross-cutting priorities should be taken into consideration: reducing asthma disparities, fostering asthma awareness and education, focusing on asthma throughout the lifespan, changing systems and policies within organizations, and creating the most health protective asthma policies.

To reach the five goals and forty objectives outlined here, new partnerships and collaborations will be needed. Working together over the next five years, state agencies, nongovernmental organizations, communities, and concerned stakeholders can achieve many of the goals, objectives, and strategies outlined in this *Plan*, making California a healthier place for everyone, especially people with asthma.

The *Strategic Plan for Asthma in California, 2008–2012,* contains strategies for each objective along with sample performance indicators.

Goals and Objectives

GOAL 1: Implementation, Monitoring, and Evaluation of the Strategic Plan for Asthma and State Infrastructure Enhancements

Goal Statement

A coordinated and integrated infrastructure built upon public-private partnerships will exist statewide, regionally, and locally to support collaboration in implementing the *Strategic Plan for Asthma in California*, in monitoring progress toward its objectives, and in sustaining its accomplishments.

1. Raise public awareness of asthma and the *Strategic Plan for Asthma in California*.
2. Develop a comprehensive and coordinated asthma program within the Department of Health Care Services (DHCS) and the California Department of Public Health (CDPH); one that collaborates with other departments and divisions at the state level.
3. Develop and revise, as needed, work plans to meet goals and objectives outlined in the *Strategic Plan for Asthma in California*.
4. Implement, monitor, and evaluate the *Strategic Plan for Asthma in California* at the local and state levels.
5. Enable and empower local public and private organizations to implement the *Strategic Plan for Asthma in California*.
6. Interface, coordinate, 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

California policy makers, health plan leaders, health care providers, employers, and the public will understand the importance of asthma and its continued threat to public health. Asthma data will be utilized to plan, implement, and evaluate interventions, with particular attention to vulnerable populations.

Objectives

1. Maintain and expand asthma surveillance in California at the state, county, and sub-county levels.
2. Use surveillance data to document disparities and target interventions that may eliminate disparities in asthma prevalence, diagnosis, treatment, and outcomes, and monitor progress.
3. Develop necessary infrastructure in DHCS and CDPH that provides organization, accessibility, integration, management, evaluation, and linkage of asthma data.
4. CDPH will establish collaborative partnerships with research institutions, health plans, health care providers, pharmacists, independent practice associations, medical groups, managed care providers, Medi-Cal and Medicare, community based organi-

zations, and others to identify a range of asthma research priorities, to study asthma and to evaluate and translate interventions for preventing and managing asthma.

5. Policy regarding asthma in California will be informed by analysis and interpretation of data.

GOAL 3: Health Care

Goal Statement

Comprehensive, culturally appropriate, patient- and family-centered asthma care will be accessible to all people in California, resulting in optimal prevention, diagnosis, treatment, and management of asthma consistent with or exceeding national guidelines.

Objectives

1. Develop and promote statewide implementation of "standards of asthma care" for the diagnosis and management of asthma in collaboration with California's public and private health care delivery and payer systems.
2. Facilitate coverage and reimbursement for a comprehensive chronic disease management approach to asthma within public and private health care payer systems.
3. Expand quality improvement (QI) for asthma care within public and private health care delivery and payer systems to assess, improve, and sustain the provision of high-quality asthma care within and across systems.
4. Ensure seamless/integrated asthma care and enhance communication between primary care providers, emergency departments/urgent care centers, hospital inpatient settings, and community settings within public and private health care delivery systems.
5. Improve asthma knowledge and competency of health care practitioners, allied health professionals and community health workers, with a high priority on those serving underserved populations.
6. Increase access to high quality asthma care for underserved populations in California by implementing best practice policies and strategies to reduce the following barriers to care: cost, culture, language, and location/distance.

Goal 4: Indoor Environments

Goal Statement

All communities in California will benefit from schools, child care centers, workplaces, 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.

A. Schools Objectives

1. Establish comprehensive and coordinated asthma policies and procedures in school districts to ensure the health and well-being of students with asthma.

2. Assess schools/districts compliance with existing codes and best practices that impact asthma, and ensure that laws and regulations adequately address indoor environmental quality issues and asthma management in schools.
3. Increase the number of qualified personnel in schools and districts to better meet the needs of students with asthma.
4. Institute targeted and specialized trainings for all district personnel on asthma and on environmental factors that impact asthma in schools; include health personnel, administrators, teachers, front office staff, coaches, maintenance and facility personnel, food preparation workers, and bus drivers.
5. Minimize exposure to contaminated outdoor air and promote safe and healthy outdoor school environments.

B. Child Care Objectives

1. Ensure the health and well-being of children with asthma in child care settings through a set of comprehensive and coordinated asthma policies and procedures.
2. Increase the availability of child care health consultants, health personnel, and technical assistance resources to help child care providers manage asthma.
3. Work with the California Department of Social Services (Community Care Licensing) to ensure that laws and regulations for licensed child care facilities adequately address asthma-related and indoor environmental quality issues, that education about laws is sufficient, and that regulations are enforced.
4. Minimize exposure to contaminated outdoor air and promote safe and healthy child care facility outdoor environments.

C. Homes, Housing, and Institutional Settings Objectives

1. Improve understanding of asthma trigger exposure in home environments and assess effectiveness of exposure reduction interventions (e.g., the problem of secondhand smoke in multi-unit housing environments).
2. Develop and promote standards, guidelines, and model policies for asthma-safe healthy housing that minimize indoor environmental risk factors that contribute to asthma.
3. Educate various stakeholder groups on the importance of reducing indoor environmental risk factors in housing that contribute to asthma.
4. Ensure healthy home environments for people with asthma through augmenting home assessments, remediation, and legal advocacy.
5. Reduce asthma morbidity and exposure to asthma triggers for people in institutional settings, such as foster and group homes, prisons, nursing homes, and mental health institutions.

D. Workplace Objectives

1. Improve data collection, surveillance, and evaluation of data on work-related asthma (WRA), and ensure data are used for prevention.

2. Develop and implement strategies to prevent WRA.
3. Increase awareness and knowledge about WRA and its prevention among health care providers, employers, workers, and communities.

Goal 5: Outdoor Environment

Goal Statement

A healthy and safe outdoor environment will exist for all Californians, with a particular focus on optimizing respiratory health.

Objectives

1. Support policies and community plans that improve conditions for people with asthma.
2. Ensure public awareness, participation and transparency in public policy decisions and improve communication between Air Quality Management Districts (AQMDs) and the communities they serve.
3. Target the elimination of disproportionate exposure to outdoor air pollution among specific groups or communities.
4. Reduce air pollution from sources such as "goods movement" industries, stationary industries, and transportation.
5. Reduce worker and public exposure to asthma triggers related to agricultural practices, forestry practices, and other outdoor workplaces.
6. Decrease exposure to second-hand smoke.

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

Over five million Californians have been diagnosed with asthma and almost three million suffer from current asthma.[1] Lifetime prevalence of asthma among adults increased 80 percent from 1984 to 2005 (7.6 percent vs. 13.7 percent). Similar increases have been shown for the U.S. overall.[2] The prevalence of lifetime asthma in California is about one percentage point higher than in the U.S. overall.

Asthma prevention and management practices should prevent people with asthma from having any asthma attacks. Nonetheless, more than 90 percent of individuals with current asthma experienced asthma symptoms in 2005.[3] Even worse, tens of thousands of people with asthma in California end up in the emergency department (ED) or are hospitalized. In 2005, approximately 150,000 ED visits and 36,000 hospital discharges were attributed to asthma in California.[4] About 13 percent of people hospitalized for asthma in 2005 had more than one asthma hospitalization during that year, indicating a critical level of uncontrolled asthma. One encouraging trend is that there has been a decline in overall asthma hospitalization rates in California over the past ten years (about 25 percent) and California rates have consistently been about 1.5 times lower than overall U.S. rates.[5]

While deaths from asthma are also largely preventable, they still occur. In 2004, there were 450 deaths due to asthma in California. Although annual mortality rates for asthma in California have been historically higher than U.S. rates, state mortality rates have

been declining significantly (about 33 percent) over the past five years, bringing California rates to about the same level as the rest of the nation.[6]

Disparities in Asthma Burden

There are considerable disparities in the burden and management of asthma by race and ethnicity, income, age, and other risk factors.[7] By race and ethnicity, Blacks in California suffer the most severe disparities. Compared to non-Hispanic Whites, asthma prevalence among Blacks is 30 percent higher, rates of ED visits are two times higher, and hospitalization and death rates are about three times higher.[8] California's American Indian\Alaska Native, Latino, and Asian populations are also more adversely affected by asthma compared to non-Hispanic Whites.[9] Low income status is also a significant risk factor for asthma morbidity in California.[10] Household income below $20,000 is associated with more frequent asthma symptoms and higher asthma hospitalization rates.[11]

Asthma disparities are also found between different age groups. While twice as many adults as children have asthma, children have a proportionally larger asthma burden than adults in California.[12] Children ages 5–17 years have the highest lifetime asthma prevalence (15.8 percent) and current asthma prevalence (10.4 percent) compared to other age groups. Rates of asthma ED visits and hospitalizations are about two times higher among children than adults.[13]

Other important risk factors for asthma include workplace exposures, exposure to tobacco smoke, and obesity. In California, it is estimated that between 137,000 and 315,000 adults have asthma due to their work environment.[14] Some of the industries with the highest rates of work-related asthma are local transit, wood manufacturing, utilities, and heavy construction.[15] Exposure to second hand tobacco smoke is associated with increased asthma symptoms and attacks in both children and adults and is also associated with higher risk of developing new asthma.[16] Eleven percent of California adults with asthma are exposed to tobacco smoke in their homes and asthma prevalence is higher among smokers than non-smokers.[17] Obesity is also an established asthma risk factor among both children and adults. Asthma prevalence is 20 percent higher among people classified as obese, than among people at normal weights.[18]

Costs

There are many substantial direct and indirect expenses associated with asthma. For example, the direct cost of hospitalizations in California accounted for $763 million in 2005. The average charge for an asthma hospitalization has increased 158 percent since 1995 and is now $23,953. Government-funded health insurance programs (Medicare and Medi-Cal) cover 61 percent of charges for asthma hospitalizations and 39 percent of charges for asthma ED visits in California. Expenses related to lost productivity are difficult to measure, but the Asthma and Allergy Foundation of America estimated California's indirect costs for asthma were nearly $545 million in 1998.[19]

The Strategic Planning Process

Reasons for Revising the Plan

The first *Strategic Plan for Asthma in California* was released in 2002.[20] After five years had passed, many stakeholders expressed an interest in revising and updating the *Plan*. Reflecting on collective experiences with using the 2002 *Plan*, stakeholders expressed common views that the new *Plan* could be improved by incorporating current knowledge, research, and statistics about asthma; promoting interventions that have been demonstrated to be effective; and sharing program experience and materials developed in different regions of the state. Finally, California wanted to join the other states and the Centers for Disease Control and Prevention (CDC) in promoting the continued use of state-level strategic planning to achieve greater coordination among partners and thus greater reduction in the social and economic burden of asthma.

Assessment Process

A Strategic Plan steering committee comprised of California Department of Public Health (CDPH) staff evaluated the 2002 *Plan* according to the following nine components recommended by the CDC:

- involve stakeholders
- present disease burden and asthma control efforts
- set goals
- define objectives
- select and implement strategies for intervention
- integrate strategies with other programs
- identify resources for implementing the *Plan*
- evaluate state plan implementation
- make the state plan accessible

A preliminary review indicated the *2002 Strategic Plan for Asthma in California* had both strengths and weaknesses when compared to the CDC framework. The steering committee also reviewed asthma strategic plans from other states and identified consistent features within exemplary plans that provided a sound model for developing a new framework for the California *Plan*.

Gathering Information from Stakeholders

Two large stakeholder meetings and interviews with key informants were conducted between July and November 2006. The first meeting involved staff from state government agencies that shared missions and mandates to address asthma or had professional interests in reducing the burden of asthma in California. Participants discussed accomplishments of the first *Plan* and suggested revisions for the *Plan*. Consultant facilitators drafted a report of the meeting. Thirty key informant interviews were conducted in August and September 2006. Interviewees were asked to comment on the 2002 *Plan* and recommend new directions and new objectives for a revised *Plan* and the consultant interviewer produced a report (available upon request). Next, a meeting of asthma stakeholders from around the state was held on October 10, 2006. Participants were provided an assessment of the current *Plan* based upon CDC criteria (see above), reports from the previous meeting and interviews, information on the burden of asthma in California, and a proposed framework for the revised *Plan*. They were divided into small groups according to the proposed goal areas and were asked to comment on the draft goal statement, make recommendations about objectives and strategies for the goal, and, whenever possible, suggest performance measures for the proposed objectives or strategies.

Crafting the New Plan

Materials from the interviews and meetings were assembled, reviewed, and incorporated by consultants into new draft strategic plan goals, objectives, and strategies by December 2006. The steering committee provided substantial input and edits throughout the process.

Stakeholder Review and Comment

The draft *Plan* was posted on the CDPH website. In early 2007, all meeting invitees and interviewees were requested to comment upon the draft *Plan* and to forward the request for comments to any of their local partners. Comments from stakeholders were reviewed by the steering committee and consultant, and in many cases, resulted in new edits that were incorporated into subsequent drafts of the *Plan*.

Finalizing the Plan

Final editing of the *Plan* occurred from February to April 2007, prior to submission for review and approval by CDPH. A separate proposal to promote and disseminate the *Plan* was developed simultaneous to finalizing the *Plan*.

The Next Five Years: A Comprehensive Approach to Asthma

In creating a new *Plan,* several key elements of the strategic plan structure and process had to be developed. These elements include a vision statement that describes the ideals to which we aspire in responding to asthma in our state; guiding ethical principles that should inform all aspects of the plan implementation; revised goal areas and goal statements that more fully capture the diverse asthma landscape in California; cross-cutting issues that should be considered as common priorities within each of the new plan's goals, objectives, and strategies; and observations about moving the plan into action.

Purpose

The *Strategic Plan for Asthma in California, 2008–2012,* sustains and builds upon substantial achievements already made in addressing asthma over the past five years under the previous *Plan* and is intended to mobilize individuals, organizations, communities, and state agencies to collectively take clearly defined, comprehensive, and coordinated action on asthma over the next five years. Successful implementation of this *Plan* will reduce the significant burden of asthma in California; ensure the appropriate prevention, diagnosis, and management of asthma for individuals in all settings; eliminate asthma disparities; and significantly improve the quality of life for all 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 respond cooperatively to the existing burden of asthma. Multiple sectors (both public and private) work together in a system that prevents, heals, and manages asthma, consistent with fundamental values of equality and fairness. A vigorous and cross-disciplinary research program has identified safe and optimal measures to prevent and manage asthma. Effective and proactive asthma policies and best practices are developed and implemented throughout the state, based upon the best available evidence.

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 2010 (Figure 1. Healthy People 2010: Asthma Related Goals) and to successfully achieve other goals specified in the *Plan*. Certain ethical principles should be observed in addressing the asthma burden.

Figure 1. Healthy People 2010: Asthma Related Goals

1.9	Reduce pediatric asthma hospitalization rates.
14.29	Increase the proportion of high-risk adults who are vaccinated annually against influenza (note: could also apply to high-risk children).
24.1	Reduce asthma deaths.
24.2	Reduce hospitalizations for asthma.
24.3	Reduce hospital ED visits for asthma.
24.4	Reduce activity limitations among persons with asthma.
24.5	(Developmental) Reduce number of school or work days missed due to asthma.
24.6	Increase proportion of persons with asthma who receive formal patient education including information about community and self-help resources, as an essential part of the management of their condition.
24.7	(Developmental) Increase proportion of persons with asthma receiving appropriate asthma care according to NAEPP Guidelines.
24.7a.	Persons with asthma who receive written asthma action plans from their health care provider.
24.7b.	Persons with asthma with prescribed inhalers who receive instruction on how to use them properly.
24.7c.	Persons with asthma who receive education about recognizing early signs and symptoms of asthma episodes and how to respond appropriately, including instruction on peak flow monitoring for those who use daily therapy.
24.7d.	Persons with asthma who receive medication regimens that prevent the need for more than one canister of short-acting inhaled beta-agonists per month for relief of symptoms
24.7e.	Persons with asthma who receive follow-up medical care for long-term management of asthma after any hospitalization due to asthma.
24.7f.	Persons with asthma who receive assistance with assessing and reducing exposure to environmental risk factors in their home, school, and work environments.
24.8	(Developmental) Establish in at least 25 states a surveillance system for tracking asthma death, illness, disability, impact on occupational and environmental factors on asthma, access to medical care, and asthma management.
27.13	Establish laws on smoke-free indoor air that prohibit smoking or limit it to separately ventilated areas in public places and worksites.

The **principle of equity** is guided by fairness, impartiality, and justice. When reflected in our approach to asthma, it should lead us to erase disparities in the incidence and prevalence of asthma, in exposure to asthma triggers and irritants, and in 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 just 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. This should lead us to involve all stakeholders in the planning and evaluation of our efforts. Every individual and organization focused on asthma has a discreet role to play in planning, implementing, and evaluating the *Plan*. Fully utilizing existing partnerships and resources and creating new partnerships ensures the most sustainability; where these do not exist, objectives and strategies should be developed to identify and obtain them.

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. Improved integration and coordination at the state, local, and community level is essential for the prevention and management of asthma.

Cross-Cutting Priorities

In order to address the numerous issues impacting asthma, the S*trategic Plan for Asthma in California* incorporates critical cross-cutting issues that are emphasized throughout the document. These are issues that are relevant to each of the *Plan's* goals and are often central to particular objectives and strategies. The *Plan's* cross-cutting priorities are: disparities; education and awareness; a focus across the lifespan; institutional and systems change; and policy.

Disparities

Health disparities are inequalities in the burden of disease. Healthy People 2010 defines these disparities as differences in disease prevalence, access to care, or health outcomes by gender, race and ethnicity, socioeconomic position, geographic location, and other characteristics.

In California, asthma disproportionately burdens many disadvantaged urban and rural communities and these are often times communities of color. Lack of access to appropriate clinical services and/or medication, living in substandard housing or in close proximity to residential and industrial sources of pollution, occupational exposures to chemicals, and attending schools in disrepair can all contribute to poor asthma outcomes such as increased hospitalizations and increased mortality.

The *Strategic Plan* addresses the need for improved surveillance data to more effectively target interventions that eliminate asthma disparities. It highlights the need for increasing access to high quality asthma care for underserved populations; providing education and training for foster care providers, health care workers, public health nurses, local housing authorities, labor force, and affordable housing stakeholders to better educate them about asthma; and reducing the disparate exposures to indoor and outdoor asthma triggers in low-income communities and communities of color.

Awareness and Education

Increasing awareness about the importance of asthma is a priority throughout the entire *Plan*. Without awareness at all levels of public, private, and legislative sectors, a well-informed commitment to addressing asthma cannot be realized.

It is essential that appropriate asthma education and training (based upon national guidelines, current research findings and expert opinion) are available for all affected individuals and health care providers, as well as those in other settings who interact closely with people with asthma. Since asthma is a chronic disease affected by many facets of an individual's indoor and outdoor environment, it is important to create environments that are safe and healthy for those with asthma. School and child care personnel, personnel in institutional settings and the workplace, and those responsible for public buildings, public environments, and community planning need to be informed about their ability to make these specific environments safer for people with asthma.

Focus Across the Life Span

Asthma affects individuals of all ages, from infancy to later adulthood. Studies demonstrate that most individuals first develop symptoms of asthma before the age of five years,[21] but it is often underdiagnosed.[22] Thorough medical history can establish the diagnosis if recognized risk factors for persistent disease are identified. Unfortunately, even with diagnosis, many infants and children do not receive adequate asthma treatment.[23] Other important considerations in childhood asthma include controlling and preventing symptoms, ensuring access to necessary medications, reducing exposures to indoor asthma triggers, and reducing the very high levels of preventable emergency and hospital visits. School-age children with asthma are also frequently impacted by exercise-induced symptoms[24] and asthma-related school absences.[25] Asthma is the most common chronic disease in children.[26] Some children do eventually outgrow it. Yet, for many who may seem to outgrow it as they get older, it frequently comes back later in life.[27]

Many individuals are diagnosed with asthma for the first time when they are teens or adults. Many different factors may be related to adult onset asthma including workplace exposures, smoking or second-hand smoke exposure and, for some women, hormone replacement therapy. The proportion of adult onset asthma that can be attributed to workplace exposures has been estimated to be around 15 percent.[28] There are currently over 350 substances known to cause new onset work-related asthma.[29] The normal aging process or the onset of various chronic diseases may complicate the management of asthma. In some adults, chronic bronchitis and emphysema may coexist or be confused with asthma. When heart disease or other chronic conditions

(such as gastro-esophageal 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.[30] 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, adult day care, and mental institutions. These settings affect their exposures to factors that may cause or exacerbate asthma.

Institutional and Systems Change

The development and implementation of model standards, guidelines, and protocols can result in institution and systemwide reductions in the burden of asthma. These changes can be at the institution level — that is, the individual school, child care facility, workplace, or nursing home setting. They can also be elevated to a system level, as in a school district, an entire industry, health care delivery groups, or other institutions. Or, they can be statewide initiatives.

In order for institutional and systems change to begin and be sustained, cross-disciplinary networks and partnerships with groups that have similar goals need to be developed and nurtured. Examples of such partnerships include those with organizations active in tobacco control, obesity and nutrition, environmental/"green" building, and community coalitions.

The California *Plan* recommends the creation of new statewide committees such as a state interagency work group to coordinate activities required for implementation and evaluation of the state *Plan*, and a working group of multi-disciplinary representatives from the public and private sector to facilitate the implementation, monitoring, and evaluation of the *Plan*. These represent a system-wide approach for a coordinated and integrated infrastructure required to successfully implement the *Plan*.

There are numerous other examples of institutional and systems changes throughout the *Plan*. Guidelines that center on the physical environment of work places, schools, child care, homes and housing may be useful in effecting change in these important locations where persons with asthma spend much of their time. The development, promotion, and enforcement of existing regulations related to environmental control, as well as the development and application of statewide consensus standards of care for the treatment of asthma, can also have a significant impact. Additionally, the opportunities for capacity building and training for asthma advocates in all disciplines are critical to institutional and systems change and are included throughout this *Strategic Plan*.

Policy

Policy is a spectrum of strategies ranging from professional guidelines, standards, and protocols to regulations and legislation. Policy effectively involves every goal in the *Strategic Plan*. For this reason, rather than describing policy as a separate goal area as in the previous 2002 *Plan*, it is 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 public and stakeholder awareness, identifying key advocates, and taking advantage of windows of opportunity. Examples of important asthma-friendly policies enacted over the past five years include the inhaler access law allowing students to self-carry medications at school;* second-hand smoke bans in public places;† leaf burning prohibitions;‡ and school bus idling laws.§

The *Strategic Plan* supports additional policy initiatives for managing asthma symptoms and eliminating environmental triggers. These include expanding coverage for necessary asthma control medications for all people in California; facilitating the coverage of comprehensive care management for those with persistent and high-risk asthma; and evaluating laws and regulations for schools, child care facilities, and housing to ensure that they address the needs of those with asthma. In addition, there is an overarching commitment to recommend policies supported by reliable data.

Goals for the New Strategic Plan

The new *Strategic Plan for Asthma in California, 2008–2012,* outlines five major goal areas as a framework for identifying important objectives and strategies for action over the next five years. These include:

Goal 1: Implementation, Monitoring, and Evaluation

Goal 2: Surveillance and Research

Goal 3: Health Care

Goal 4: Indoor Environments

Goal 5: Outdoor Environment

Each goal is framed by a goal statement and a brief discussion of the leading issues for consideration within the goal category.

Moving the Strategic Plan into Action

The *Strategic Plan for Asthma in California, 2008–2012,* is written for use by state and local health departments, public health agencies, asthma organizations and coalitions, health care providers, health care delivery organizations, academic and research institutions,

* Self-administered asthma medication law: California Education Code Section 49423.1

† Second-hand smoke bans: California State Labor Code 6404.5; Government Code 7596–7598, 19994.30, and 19994.33.

‡ Burning prohibitions: California Health and Safety code, Sections 41850–41866; 41800–41815

§ School bus idling: California Code of Regulations (CCR) Chapter 10, Article 1, Section 2480, title 13 www.arb.ca.gov/regact/sbidling/fro.pdf

child care centers, unions, schools, workplaces, institutional settings, policymakers, legislators, business sectors, and all communities and individuals within California that have an interest in the problem of asthma.

Successful implementation of the *Plan* will depend on collaboration, innovation, leadership, and the allocation of necessary financial and human resources. State and local organizations may choose to use the *Plan* to prioritize the goals and objectives according to relevant priorities and opportunities to achieve success. The *Plan's* framework may also be used to identify additional important objectives and strategies that are not described in this document. In order to accomplish these and other far-reaching *Plan* objectives and strategies, interested stakeholders may accelerate their progress through collaboration and the development of work plans. The *Plan* will also be invaluable for raising awareness among key stakeholders and for supporting necessary change through new initiatives, policies, and practices. The importance of evaluating and measuring progress in *Plan* implementation is reflected in the identification of sample performance indicators following each objective. Recognizing that success may be measured in many ways, these indicators may also serve as a guide for establishing other important achievement standards over the next five years.

Ultimately, coordinated and sustained efforts to implement the *Plan's* strategies will benefit the health and well-being of millions of Californians, in addition to their families, friends, and their communities.

Goals, Objectives, Strategies for the Next Five Years

GOAL 1: Implementation, Monitoring, and Evaluation of the Strategic Plan for Asthma and State Infrastructure Enhancements

Goal Statement

A coordinated and integrated infrastructure built upon public-private partnerships will exist statewide, regionally, and locally to support collaboration in implementing the *Strategic Plan for Asthma in California, 2008–2012*, in monitoring progress toward its objectives, and in sustaining its accomplishments.

Overview

Asthma in California is a complex problem requiring interventions that optimize use of limited public health and health care resources. The interventions must therefore be coordinated between the private and public sectors; across the public sector; at large, medium, and small geographic levels; and over time.

A model approach to address asthma includes vigorous research, full capacity to monitor its distribution and trends, effective clinical management protocols that are widely known and used, informed, and supportive family members and caregivers, policies designed to protect those with asthma, institutions that accommodate the needs of people with asthma, and a safe indoor and outdoor environment.

Over the past five years, California has benefited from significant investment in asthma by prominent foundations, federal agencies, and from state tobacco tax funds. Childhood asthma programs and chronic disease collaboratives have demonstrated tremendous improvements in the quality of clinical asthma care and in reducing disparities. Comprehensive information on asthma has been obtained, organized at the county level, and disseminated widely. Community coalitions have increased in number and strength. These coalitions have worked with clinics, hospitals, schools, and local air districts to raise awareness of asthma. Legislation was passed to improve air quality, decrease traffic related emissions, empower students to carry asthma medications, and decrease exposure to tobacco smoke in public places.

Goal 1 highlights the framework required to accomplish the other goals of this ambitious *Plan*. It directs attention to building and reinforcing an effective public health infrastructure statewide, regionally, and locally. Broad public-private partnerships will lead to effective communication and strong coordination. Coordinated governmental efforts will assure that progress on the *Plan* is monitored, successful interventions are widely shared, and that resources will be available to support the many state and local initiatives required to address asthma. Continuous evaluation of *Plan* partnerships, implementation, and achievements will allow for more focused and effective efforts to prevent, manage, and control asthma in the years to come and to achieve the greatest benefits for all people with asthma.

Objectives and Strategies

1.1. Raise public awareness of asthma and the *Strategic Plan for Asthma in California*.

1.1.1. Promote the *Plan* to key stakeholders in the public and private sectors at the local, regional, state, and national levels by widely disseminating printed and electronic copies of the *Plan*; post the *Plan* on the web and create query mechanisms to enable rapid searches within the plan by sector (e.g., health care, schools) and types of intervention (e.g., systems change, policy change); and, meet with policymakers, key decision makers and major grant makers to raise awareness of the *Plan* and to help ensure the *Plan* is put into action.

1.1.2. Conduct an effective public communication campaign to raise awareness of asthma, including identifying and developing a list of consumer rights for people with asthma.

Sample Performance Indicators

Number of *Plans* distributed in print version or downloaded from the web site.

Meetings are held with policy makers and key decision makers to raise awareness of the *Plan* and are documented.

1.2. Develop a comprehensive and coordinated asthma program within the Department of Health Care Services (DHCS) and the California Department of Public Health (CDPH) and one that collaborates with other state departments and divisions. The Departments will:

1.2.1. Develop an intra-departmental and combined departmental coordinating structure that will clarify the working relationship and leadership roles of the two new departments and ensure a shared vision, common goals, and prioritized strategies.

1.2.2. Develop and support an inter-departmental work group comprised but not limited to DHCS, CDPH, California Department of Education (CDE), California Environmental Protection Agency (Cal/EPA), California Occupational Safety and Health Administration (Cal/OSHA), Department of Housing and

Community Development, Community Care Licensing, Office of the State Architect, Department of Transportation, and others.

1.2.3. Support optimum commitment of personnel, material, and financial resources for on-going implementation of the *Plan*.

1.2.4. Fully utilize existing data maintained by other departments and where appropriate, establish opportunities for data exchange mechanisms and agreements between departments within the State of California for data relevant to asthma surveillance.

1.2.5. Ensure that leaders and policy makers are well informed on asthma in California, and are able to access public and private expertise regarding asthma-related issues, policy and legislation.

Sample Performance Indicator

Multi-disciplinary intra- and inter-departmental asthma coordination committees are formed at the state level.

1.3. Develop and revise, as needed, work plans to meet goals and objectives outlined in the *Strategic Plan for Asthma in California*.

1.3.1. Identify specific strategies, measurable outcomes when possible, and time frames for objectives and goals. This process is on-going, given the iterative nature of the five-year plan.

1.3.2. Identify departments and divisions within the state and local government that will be responsible for (or contribute to) accomplishing specific *Plan* objectives.

1.3.3. Identify other organizations and entities in the public and private sectors at the local, regional, and state levels that agree to address (or contribute to accomplishing) specific *Plan* goals and objectives.

1.3.4. Encourage public and private agencies and asthma coalitions at the state, regional, and local levels to use the *Plan* to shape their internal work plans and strategic planning.

Sample Performance Indicators

Work plans for the California Department of Public Health and the California Department of Health Care Services are developed to implement specific *Plan* goals and objectives.

Work plans are created in other state departments.

1.4. Implement, monitor and evaluate the *Strategic Plan for Asthma in California* at the local and state levels.

1.4.1. Support a committee that consists of a diverse group of asthma stakeholders and experts from the public and private sectors at the state, regional, and local levels to facilitate the implementation, monitoring and evaluation of the plan.

1.4.2. Hold a Statewide Asthma Summit every two years that brings together key constituents to assess the status of asthma in California, refine program and policy directions, assess research, lay the groundwork for future activities, and to support an ever-growing asthma network within California.

Sample Performance Indicator

A *Plan* facilitation committee is formally established and a statewide asthma summit is held.

1.5. Enable and empower local public and private organizations to implement the *Strategic Plan for Asthma in California*.

1.5.1. Support, expand, and strengthen local asthma coalitions and other coalitions that have goals in common with asthma throughout California. Support existing communication and technical support infrastructures, at the state and regional levels, for these coalitions and programs (e.g., Regional Asthma Management & Prevention (RAMP), Community Action to Fight Asthma (CAFA), California Asthma Public Health Initiative (CAPHI), Best Practices in Childhood Asthma (BPCA), California Asthma Partners (CAP), California Breathing (CB), and tobacco control coalitions, nutrition, and physical activity-related groups).

1.5.2. Develop mechanisms and guidance for locally based public and private organizations to work together with local public health departments, local school boards, local air districts, and others to advance the *Strategic Plan*. These will draw on local expertise throughout the state, synthesize best practices for such collaborations and promote these best practices, fund local forums for public and private sectors to develop and/or strengthen collaborative relationships to improve asthma management and prevention.

1.5.3. Maintain a single website/portal dedicated to asthma in California that will include, or link to: current data on asthma; the *Strategic Plan*; work plans to carry out the strategic plan; updates on the implementation, monitoring and evaluation of the strategic plan; asthma organizations throughout California, including an on-line asthma network for individuals, organizations, institutions and coalitions working to address asthma in order to share successes and challenges; best practices and educational opportunities; and information about current research in the field.

1.5.4. DHCS and CDPH will 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 Public Health Institute, the California Wellness Foundation, the Proposition 10 Commissions, First 5 California, etc.

1.5.5. Identify and develop adequate and sustained long-term funding mechanisms and sources for asthma services, programs, policy work, and coalition work at the local and regional levels.

Sample Performance Indicators

Number of counties with at least one asthma coalition involving representatives from the local health department, the local air quality management district, schools, and health care groups.

A web site is identified and a plan is in place to build the site with features determined by recommendations from asthma stakeholders.

1.6. Interface, coordinate, and collaborate with other states, as well as national and international organizations, on the prevention and management of asthma.

1.6.1. Participate in national and international initiatives and work groups pertaining to asthma, respiratory health, disparities, and/or air quality.

1.6.2. Whenever possible; collaborate with other public health movements such as but not limited to: universal health care; health care quality improvement; elimination of health disparities; poverty reduction; income/wealth disparity reduction; environmental justice; smart growth; healthy communities; global warming; tobacco control; obesity and diabetes initiatives; the goods movement; sustainable energy; and green building to prevent and control asthma and other illnesses, and to create environments that will optimize health.

1.6.3. Present California's work on controlling asthma through programmatic actions, systems change, and policy change at state, national, and international conferences and meetings.

1.6.4. Consider innovative and effective asthma practices from local counties, other states and countries in planning California's ongoing asthma efforts.

Sample Performance Indicator

Number of non-asthma organizations adopting positions that support the *Strategic Plan for Asthma in California*.

GOAL 2: Surveillance and Research

Goal Statement

California policy makers, health plan leaders, health care providers, employers, and the public will understand the importance of asthma and its continued threat to public health. Asthma data will be utilized to plan, implement and evaluate interventions, with particular attention to vulnerable populations.

Overview

Surveillance, a critical component of public health efforts, is "the ongoing, systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event for use in public health action to reduce morbidity and mortality and to improve health."[31] Asthma surveillance is essential for creating effective policies and

interventions to prevent or better control asthma on a population basis. It also allows for the comparison of disease rates and the determination of trends to measure progress of programs aimed at reducing asthma.

Asthma surveillance in California has expanded a great deal in the past five years and now includes data on prevalence, symptoms, education, risk factors, work-related asthma, health care utilization, and mortality. There is currently a focus on asthma disparities and an effort to produce regular, timely reports of this data. However, there are additional opportunities to expand the scope of asthma surveillance, including broader application of existing measures, developing and adding new measures, improving data sharing systems, enhancing stakeholder input into strategic planning for surveillance, and increasing dissemination efforts.

As a complement to surveillance, research provides important information pertinent to effective interventions for prevention and management of asthma. The amount of research on asthma has grown in recent years, but key questions about etiology, prevention, treatment, and vulnerable populations are still unanswered.

Goal 2 focuses on the maintenance and expansion of asthma surveillance in California and the development of the necessary infrastructure to accomplish this task, including improved data sharing and timely public access to information. Data will be used to evaluate and target interventions to eliminate disparities in asthma, as well as to inform policy development. The facilitation of a research agenda, and convening of a research symposium that reflects the interests and concerns of researchers as well as many other partners, will advance the study of asthma. Experimental and epidemiologic research into the causes and prevention of asthma will require a cross disciplinary and integrated approach.

Objectives and Strategies

2.1. Maintain and expand asthma surveillance in California at the state, county, and sub-county levels

2.1.1. Maintain timely access to the most up-to-date asthma surveillance data in California including, prevalence, morbidity and mortality by updating the *Burden of Asthma in California: A Surveillance Report* on a regular basis.

2.1.2. Survey asthma stakeholders (with special emphasis on community members) at least every two years to assess the current status of asthma surveillance, to consider gaps and limitations in existing surveillance, and to identify strategic priorities for the modification and/or expansion of asthma surveillance efforts.

Figure 2. Potential Expanded Asthma Surveillance Areas

- Regional information; county, sub- county, zip code, and address level of resolution.
- Estimated prevalence of undiagnosed and underdiagnosed asthma.
- Expanded information about individuals with poorly controlled and high-risk asthma.
- Information about populations with small sample sizes (e.g., rural areas, ethnic subgroups).
- Expanded information related to asthma disparities.
- Prevalence of coexisting conditions such as rhinitis/sinusitis, obstructive sleep apnea, gastro-esophageal reflux disease, emphysema, chronic bronchitis, obesity, depression, and psychosocial stress.
- Ongoing surveys on asthma knowledge, attitudes, beliefs and practices of representative samples of child care providers, teachers, coaches, school nurses, primary care doctors (e.g., pediatricians, family practitioners, internists, Ob\Gyn physicians, and emergency physicians), and other health care personnel.
- Tracking of students in schools for students with diagnosed asthma, hospitalization during school hours, 911 calls, morbidity, and mortality together with school absences.
- Surveillance of 911 calls from the community for asthma exacerbations.
- Use of data from managed care organizations to better understand asthma prevalence, morbidity, and health care utilization.
- Improved Medi-Cal and Medicare asthma data.
- Environmental determinants, causes and triggers of asthma (e.g., criteria air pollutants from Air Resources Board; Toxic Air Contaminants from Office of Environmental Health Hazard Assessment; traffic related pollutants from Air Resources Board and Department of Transportation; and contaminated sites from Department of Toxic Substances Control).
- Social determinants of health that influence asthma (e.g., community violence and crime statistics from California Department of Justice; inequalities in income, wealth and employment; and environmental justice).
- Inventory of known asthma triggers (hazard surveillance).
- Information added to existing data sources on adult asthma to capture occupation, industry and work-relatedness.
- Enhancements to existing data sources (e.g., CHIS) to provide more detailed assessment of asthma management practices, history of documented allergies, and home and occupational exposures.
- Information on physician adherence to NHLBI guidelines.
- Surveillance of upstream (causes asthma) and downstream (aggravates asthma) risk factors.

2.1.3. Expand asthma surveillance in California (Figure 2. Potential Expanded Asthma Surveillance Areas).

2.1.4. Develop and adopt standardized measurements and definitions to characterize asthma prevalence, incidence, self-reported race/ethnicity, severity, morbidity, mortality, disability, asthma management measures, health care utilization, undiagnosed asthma, high-risk populations, and asthma triggers and risk factors. These measurements and definitions should be used for surveillance of asthma in children, adults, and workers.

Sample Performance Indicators

Number of new measures added to the asthma surveillance system as assessed every two years.

Stakeholders are surveyed every two years starting in 2009 (through written evaluations and/or in-person meetings) and changes in surveillance activities are made according to their input.

2.2. Use surveillance data to document disparities and target interventions that may eliminate disparities in asthma prevalence, diagnosis, treatment, and outcomes, and monitor progress.

2.2.1. Identify and monitor disparities in asthma burden and care in California, including at the state, county, and subcounty level, exploring differences by age group, gender, race and ethnic groups and sub groups, income, education level, insurance status, geographic residence, occupation, primary language, and literacy level.

2.2.2. Raise awareness of asthma disparities in California by highlighting this information in all electronic and written reports on surveillance findings.

2.2.3. Identify strategies to collect data on work-related asthma among California's most vulnerable workers, including day laborers, and migrant workers, who may not be represented in current databases.

Sample Performance Indicator

Disparities are highlighted in all surveillance reports.

2.3. Develop necessary infrastructure in CDPH and DHCS that provides organization, accessibility, integration, management, evaluation, and linkage of asthma data.

2.3.1. Establish data exchange agreements and mechanisms between Departments within the State of California for data relevant to asthma surveillance (see Goal 1, Strategy 2.4).

2.3.2. Establish data sharing protocols and mechanisms for use of asthma data among private and public stakeholders.

2.3.3. Ensure public access to up-to-date asthma surveillance data and current peer reviewed literature through: a centralized, well-publicized web-site for all asthma surveillance data and findings; wide dissemination of the most

current surveillance data and findings through annual reports and brief updates; and wide dissemination of the surveillance report, *The Burden of Asthma in California*, updated every three years (see Goal 1, Strategy 5.3).

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

Sample Performance Indicators

Data exchange agreements and data sharing protocols are established and maintained.

At least one surveillance report or update is published per year. In addition, a comprehensive surveillance report (*The Burden of Asthma in California*) is completed every three years.

A web site for dissemination of data is created, publicized, and updated regularly.

2.4. CDPH will establish collaborative partnerships with research institutions, health plans, health care providers, pharmacists, independent practice associations, medical groups, managed care providers, Medi-Cal and Medicare, community based organizations, and others to identify a range of asthma research priorities, to study asthma and to evaluate and translate interventions for preventing and managing asthma.

2.4.1. CDPH will facilitate the development of a research agenda targeted at prevention and management of asthma that could include:

a. Reasons for asthma disparities and best practices for reducing or eliminating them.

b. Workplace exposures that lead to asthma incidence, morbidity and mortality (Figure 3. Potential Workplace Asthma Research Areas).

c. Indoor and outdoor environmental exposures that lead to asthma incidence, morbidity and mortality (Figure 4. Potential Indoor and Outdoor Research Areas).

Figure 3. Potential Workplace Asthma Research Areas

- Further define high-risk industries and occupations for asthma in California and focus research in these areas.
- Refine estimates of the prevalence and incidence of new-onset asthma related to work.
- More accurately estimate prevalence and incidence of exacerbations of pre-existing asthma related to work factors.
- Investigate the economic impact of work-related asthma in California in terms of lost productivity, direct, and indirect health costs.
- Identify and characterize new asthma triggers and asthma causing agents (i.e., asthmagens) and their threshold exposure levels.
- Develop methodology to conduct surveillance of asthma hazards.
- Evaluate the effectiveness and feasibility of asthma intervention and prevention strategies.

d. Asthma management strategies that lead to a reduction in asthma morbidity and mortality.

e. Identification, translation, and implementation of evidence-based best practices in health care service delivery, at the levels of the individual practitioner, group practice and insurance plan.

2.4.2. CDPH will convene an asthma research symposium every two years to summarize recent important research findings, to assess their implications and to address current interests, and research questions as suggested by stakeholders. The symposium will provide an opportunity to track etiologic research and foster communication among researchers to increase the chances of crosscutting research (Figure 5. Possible Research Areas for Future Research Symposia).

Sample Performance Indicator

An asthma research symposium is convened every two years starting in 2008.

2.5. Policy regarding asthma in California will be informed by analysis and interpretation of data.

2.5.1. The determination of priority data to be collected will be guided by both availability and the need for developing and evaluating specific policies and interventions.

2.5.2. Data analysis, reports, and key findings will be disseminated to policy makers, health care providers, employers, community based organizations and the public.

2.5.3. Data will be identified, analyzed, and interpreted to support policy development for goals 1–5 of this *Plan*.

2.5.4. When data is limited or unavailable, expert opinion and the best available evidence will be used to assess policy proposals and to guide policy development.

Sample Performance Indicator

Data is considered in policy decisions and policy is considered in setting data priorities.

Figure 4. Potential Indoor and Outdoor Research Areas

- Research related to air pollution (e.g., traffic and industrial facilities); link data from the Air Resources Board and the Air Quality Management Districts.
- Research on the pathways, drift patterns, and exposure levels of second hand smoke and the health effects associated with this trigger in multi-unit housing settings.
- Research on the connections between global warming, air pollution, and asthma.
- Research on specific asthma triggers, sensitizers, and irritants such as cleaning chemicals, pesticides, pollens, landscaping practices, and fragrances.

Figure 5. Possible Research Areas for Future Research Symposia

- Asthma medication use (for example; issues related to efficacy and compliance).
- Safety and efficacy of asthma medication use during pregnancy.
- The impact of asthma on educational performance.
- Diet/nutrition and asthma.
- Obesity and asthma.
- Effectiveness of individualized student asthma action plans in the school setting.
- Barriers to asthma treatment and management.
- Longitudinal surveillance of asthmatics who have been through an asthma case management program.
- Effectiveness of promotoras and community health workers in asthma home environmental assessments.
- Effectiveness of clinical practice-based asthma care interventions.
- New understanding of genetic, hormonal, gender, biomarkers, and other factors related to asthma expression and control.
- New findings on the relationship of asthma to allergies, including food allergies.
- Asthma co-morbidities.

GOAL 3: Health Care

Goal Statement

Comprehensive, culturally appropriate, patient- and family-centered asthma care will be accessible to all people in California, resulting in optimal prevention, diagnosis, treatment and management of asthma, consistent with or exceeding national guidelines.

Overview

Asthma is a complex chronic disease, with variable presentation, symptoms, triggers, severity, and progression. High quality asthma care includes accurate diagnosis and evaluation, appropriate treatment, effective patient education on prevention and self-management, and regular clinical follow-up.

Since 1991, the National Asthma Education and Prevention Program (NAEPP)* has provided clinical guidelines[32] and updates[33] on the appropriate diagnosis and management of asthma. The NAEPP Expert Panel Report-3 (EPR-3) is an update to the Guidelines for

* Part of the National Heart, Lung, and Blood Institute of the National Institutes of Health

the Diagnosis and Management of Asthma released in 2007.* While most health care providers are aware of these national standards, many individuals in California do not receive all of the recommended components of quality asthma care from the health care system. Studies have documented that this substandard care particularly burdens low socioeconomic status, uninsured, rural, and racially/ethnically diverse populations.[34] These disparities in the quality of health care for asthma are presumed to account for some, but not all, of the significant disparities in asthma outcomes (e.g., emergency visits, hospitalizations, and mortality) that persist. Potential barriers to care, such as language, access, insurance status, medication costs, environmental exposures, genetic factors, and individual health behaviors may also contribute to these disparities.

Many clinical and community interventions 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, care coordination, and case management as cost-effective approaches for ensuring equitable, quality asthma care.

Goal 3 seeks improved systems of care for all individuals with asthma in California. If the goal is fully implemented, everyone with asthma will experience consistent, quality asthma care based on a statewide standard. Comprehensive care services, medications, and supplies will be appropriately financed. All systems of health care will benefit from an ongoing quality improvement process, established communication systems for shared patient information, a diverse health care workforce prepared with current asthma training and expertise, and statewide initiatives that eliminate barriers to affordable, accessible, and culturally and linguistically appropriate care.

Objectives and Strategies

3.1. Develop and promote statewide implementation of "standards of asthma care" for the diagnosis and management of asthma in collaboration with California's public and private health care delivery and payer systems.

3.1.1. Convene representatives from the major public and private health care delivery and payer systems to establish, adopt, and promote statewide

* The NAEPP is part of the National Heart, Lung, and Blood Institute of the National Institutes of Health. In 2007, the NAEPP released the Expert Panel Report-3, an update to the *Guidelines for the Diagnosis and Management of Asthma (EPR-3)*. EPR-3 is available at http://www.nhlbi.nih.gov/guidelines/asthma/index.htm. EPR-3 includes a more clear identification of the existing evidence base for key recommendations and introduces several important changes. These include: (1) a new focus on the importance of ongoing assessment of asthma control following the initial severity classification; (2) a change from "mild intermittent" to "intermittent" severity classification; (3) an emphasis on assessment of current impairment and future risk; (4) a more appropriate stratification of age groups (0–4 yrs; 5–11 yrs; and 12 yrs–adult) with corresponding age-dependent categories of assessment and stepwise management; and (5) a recommendation that several key areas of quality of life, related loss of physical function, and spirometry be assessed periodically. California health care providers and health care systems will need to become familiar with these new guidelines and if supported, determine how to integrate them into existing and future asthma care.

consensus "standards of asthma care." Establish standards that, at a minimum, are consistent with the National Asthma Education and Prevention Program's (NAEPP) newly updated *Guidelines for the Diagnosis and Management of Asthma (Expert Panel Report-3)*, the NAEPP's *Key Clinical Activities for Quality Asthma Care* (Figure 6), and the *Chronic Care Model* (Figure 7).

3.1.2. Promote comprehensive care (or case) management as the standard of care for individuals with poorly controlled persistent or high-risk asthma (those with frequent ED or hospital visits) (Figure 8: Comprehensive Care Management for Asthma).

3.1.3. Translate consensus "standards of asthma care" into companion public education materials and disseminate widely to promote consumer awareness.

Sample Performance Indicator

Consensus State Asthma Standards of Care are developed and adopted.

3.2. Facilitate coverage and reimbursement for a comprehensive chronic disease management approach to asthma within public and private health care payer systems.

3.2.1. Identify and develop long-term funding for a comprehensive care management approach to asthma care and for health information technology in support of high quality asthma care (Figure 9: Health Information Technology Report Summary).

Figure 6. 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

5. Recommend measures to control asthma triggers
6. Treat or prevent comorbid conditions

Pharmacotherapy

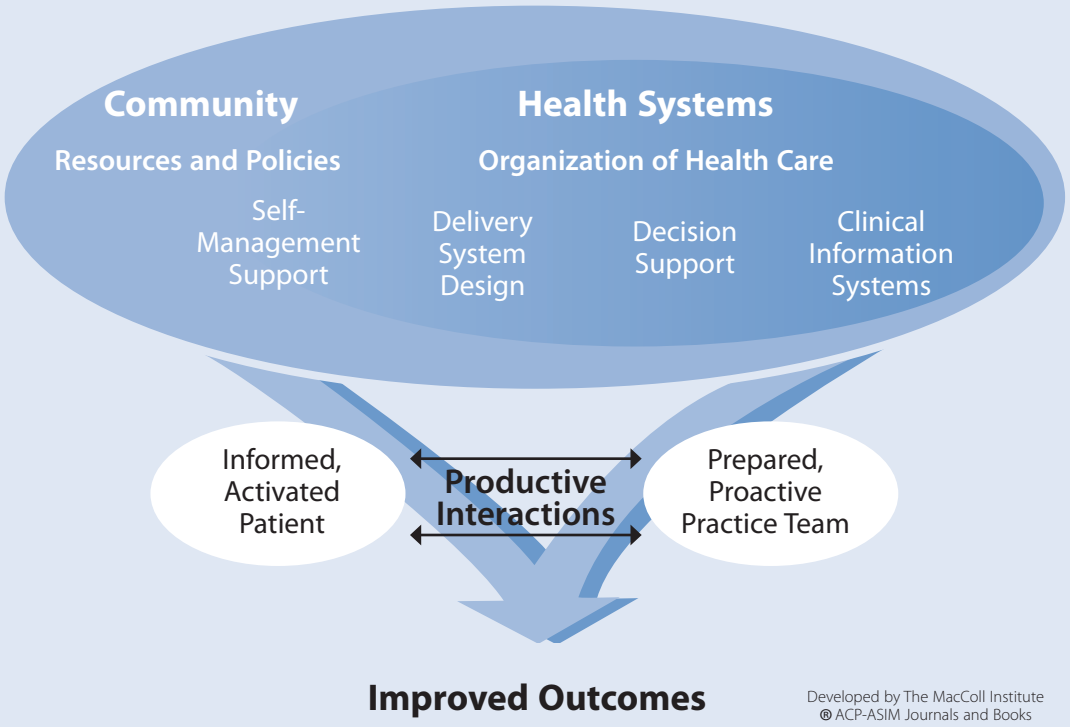
7. Prescribe medications according to initial severity and adjust accordingly to level of control
8. Monitor use of ß2-agonist drugs

Education for partnership in care

9. Develop a written asthma management plan
10. Provide routine education on patient self-management

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

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.

3.2.2. Facilitate coverage and reimbursement for comprehensive care management by public and private health care payer systems in California for individuals with persistent and high-risk asthma. Facilitate the establishment of a comprehensive current procedural terminology (CPT) code to be used when billing for comprehensive care and management.

3.2.3. Facilitate coverage and reimbursement for the following services and supplies for individuals with asthma: annual flu vaccine, lung function tests (spirometry) for asthma diagnosis, and monitoring for individuals over four years of age; allergen sensitivity assessment (either skin tests or in-vitro blood tests) for at least those patients with persistent asthma; individual-

Figure 8. Comprehensive Care Management for Asthma

Includes the following;

- Case management or care coordination for individuals with poorly controlled and high-risk asthma.
- 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, pillow\ mattress encasements, etc.).
- Patient tracking over time in a series of asthma preventive care clinic visits.
- Multidisciplinary asthma care teams consisting of a physician/nurse practitioner, a clinical care coordinator (typically a registered nurse or respiratory therapist), and a community health care worker, health educator or public health nurse.

Figure 9. Health Information Technology Report Summary

Potential Quality and Efficiency Benefits of Health Information technology (HIT)

The movement toward establishing new 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. Some examples of the benefits afforded by HIT applications are the following:

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

Source: Promoting Health Information Technology in California: A State Policy Approach (www.lao.ca.gov/2007/health_info_tech/health_info_tech_021307.aspx)

ized asthma self-management education; relevant prevention supplies (e.g., pillow and mattress encasements); duplicate medications for children if needed (i.e., one each for home and school/child care use); durable medical equipment (e.g., inhaler spacers and peak flow meters); and medically necessary specialist consultations and home visits.

3.2.4. Promote public awareness of consumer rights laws and regulations regarding state health plan coverage for asthma drugs, devices and services* including requirements for coverage of outpatient prescription drug benefits (for inhaler spacers, nebulizers, and peak flow meters when medically necessary for the management and treatment of pediatric asthma).†

3.2.5. Design and post a model universal drug formulary for asthma medications, supplies and devices as a complement to the consensus "standards of asthma care."

Sample Performance Indicator

An asthma comprehensive care benefit is defined and financed within the Medi-Cal system.

3.3. Expand quality improvement (QI) for asthma care within public and private health care delivery and payer systems to assess, improve, and sustain the provision of high-quality asthma care within and across systems.

3.3.1. Explore the potential to require all commercial and non-commercial health care plans in California to adopt and report on the same Healthcare Effectiveness Data and Information Set (HEDIS®) performance measures on asthma care‡ to assess and improve performance across all commercial plans.

3.3.2. Develop recommendations for standardized/comparable and validated QI measures (beyond HEDIS®) that assess and evaluate both quality of care and outcomes associated with care (for example, emergency room visits and hospitalizations). Formulate recommendations for data specifications for electronic medical records to ensure that asthma-related measures can be captured.

3.3.3. Facilitate use of standardized/comparable and validated QI measures (beyond HEDIS®) by public and private health care delivery and payer systems to assess, improve and sustain the provision of high quality asthma care within and across systems.§

3.3.4. Develop health care provider QI incentive and reward structures that encourage quality asthma care.

Sample Performance Indicators

Existing HEDIS® asthma measure adopted by 90% of California health plans.

New asthma QI measures are piloted by California health plans and providers.

* The California Department of Managed Health Care maintains a website to address consumer and health care provider problems and complaints regarding health plan benefits and patients' rights at www.dmhc.ca.gov

† Health plans are required to provide coverage for pediatric asthma equipment and supplies: California Health and Safety Code Section 1367.06

‡ The quality-of-asthma-care measure developed by HEDIS® identifies health plan members (age five and older) with "persistent" asthma if there was one ED visit or inpatient discharge listing asthma as the primary diagnosis, ≥4 outpatient asthma visits with two medication-dispensing events, or four medication-dispensing events in the year before evaluation. To pass the measure, members with "persistent" asthma must fill a prescription for a qualifying medication (inhaled steroid, leukotriene modifier, etc.) in the year of evaluation. Recent publications have identified limitations and questioned the reliability of the HEDIS® criteria.

§ Recent publications have identified limitations in the reliability of the HEDIS® criteria. Currently, DHCS only requires its contracted Medicaid managed care plans to submit audited HEDIS® data.

3.4. Ensure seamless/integrated asthma care and enhance communication among primary care providers, emergency departments/urgent care centers, hospital inpatient settings, and community settings within public and private health care delivery systems.

3.4.1. Facilitate the use of chronic disease case registries in primary care to improve case finding and patient monitoring and to track improvement.

3.4.2. Facilitate the establishment and improvement of mechanisms to support timely sharing of patient data between primary care providers, emergency departments, urgent care centers, and hospital inpatient settings — including mechanisms for primary care provider notification of emergency/urgent care treatment and completeness of patient discharge instructions.

3.4.3. Facilitate the establishment and improvement of mechanisms that support communication between primary care providers and community settings — including mechanisms to share patient pharmacy utilization and to improve communication between primary care providers and schools, child care centers, other institutional settings such as mental health facilities and prisons, and foster care settings.

Sample Performance Indicator

Asthma registries are utilized by 90% of surveyed primary care practices; and 90% of asthma patients have scheduled follow-up visits with their medical home within two weeks after receiving ED or hospital care.

3.5. Improve asthma knowledge and competency of health care practitioners, allied health professionals and community health workers, with a high priority on those serving underserved populations.

3.5.1. Increase the number of physicians, nurses, and physician assistants who complete nationally or state recognized asthma training programs, with a high priority on those serving underserved populations. Facilitate trainings and offer continuing education credits (CEUs) for participation.

3.5.2. Work with California medical colleges and residency programs to integrate education about consensus standards of asthma care into the physician training curriculum (see Goal 3: Objective 1).

3.5.3. Work with the Department of Corrections and Rehabilitation to ensure that all prison health care providers are aware of consensus standards of asthma care to provide appropriate clinical asthma care for youth offenders and inmates (see Goal 3: Objective 1).

3.5.4. Increase the number of Asthma Educators-Certified (AE-C) in California, with a high priority on those serving underserved populations. Encourage public and private health care payers to reimburse for patient education provided by AE-C.

3.5.5. Establish a state community health worker (CHW) certification exam on patient asthma education. Encourage public and private health care payers to reimburse for the services of CHWs who have a current certification.

3.5.6. Create opportunities for health care providers to share knowledge, experiences, and best practices, including establishing a statewide internet portal to support an online community for asthma care providers; developing collaborative quality improvement learning networks; and promoting asthma research symposiums for health care providers.

3.5.7 Promote improved recognition of asthma during pregnancy by health care providers, allied health professionals, and CHWs; and enhance their capacity to maintain excellent maternal asthma control for the health and well being of both the mother and her baby.*

3.5.8. Develop and 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*[35] for the administration of short acting beta-agonists for individuals experiencing asthma exacerbations).

Sample Performance Indicator

California develops and adopts asthma training standards for a range of health care professionals.

3.6. Increase access to high quality asthma care for underserved populations in California by implementing best practice policies and strategies to reduce the following barriers to care: cost, culture, language, and location/distance.

3.6.1. Support the elimination of health insurance denial practices for individuals with asthma as a pre-existing condition.

3.6.2. Support legislative and policy initiatives that expand or guarantee health care and drug coverage for all Californians.

3.6.3. Convene representatives within public and private sectors at state and local levels to develop a set of California recommended best practices for improving cultural, linguistic and geographic access to care for chronic conditions including asthma. Facilitate the implementation of the recommendations.

Sample Performance Indicators

California achieves an annual 10% decline in uninsured residents.

California achieves 100% health insurance coverage.

California develops and adopts Access to Care Best Practices for Health Plans.

* NAEPP Working Group Report on Managing Asthma During Pregnancy: Recommendations for Pharmacologic Treatment — Update 2004 (NIH Publication No. 05-3279), which is available at http://www.nhlbi.nih.gov/health/prof/lung/asthma/astpreg.htm.

GOAL 4: Indoor Environments

Goal Statement

All communities in California will benefit from schools, child care centers, workplaces, 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.[36] 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 also impact the ability of individuals to effectively control their asthma.

California already has in place numerous laws, regulations, and codes at both the state and local levels that protect against exposure to certain substances associated with asthma, such as smoke-free policies in schools and work settings.* However, enforcement of these laws remains a significant challenge for municipalities. In addition, many settings still do not have specific laws to limit exposure to respiratory irritants; for example, no laws require smoke-free multi-unit housing or foster care. Rental housing, alternative residential settings like group and nursing homes, and correctional, and mental health institutions present particular challenges to creating asthma-friendly environments. As a result, people with asthma may experience periods of impaired work or learning, restricted activity, and increased health care utilization and costs.

Goal 4 separately addresses schools; child care facilities; homes, housing, and institutional-care settings; and workplaces. 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, great attention is focused on ensuring that allergens and irritants that contribute to asthma are eliminated or substantially reduced.

* Secondhand smoke bans: California State Labor Code 6404.5; Government Code 7596–7598, 19994.30, and 19994.33.

A. Schools

Overview

Asthma is the most common chronic disease of children and is one of the leading causes of school absences. While asthma cannot currently be cured, it can be controlled and managed so that children are able to be active, healthy, and ready to learn. Addressing the problem of asthma in schools is both essential and challenging: California has the largest school system in the country; over six million children spend a substantial part of their week within one of California's 9,553 public schools.[37]

Asthma management in schools encompasses a range of issues, including reducing exposures to environmental asthma triggers; identifying and assisting affected students; preventing and controlling asthma symptoms; and appropriately recognizing and treating asthma attacks. Many of these issues relate to both students and school staff. Environmental issues related to asthma in school facilities include poor indoor air quality, faulty ventilation, indoor mold, pesticide use, allergenic landscaping, cleaning agents, animal contact, and exposures to outdoor air contaminants. In some facilities, harmful exposures can occur from chemicals in workshops and science labs as well as from repair and renovation activities. Crafting strong asthma policies and establishing appropriate asthma training, management, and support systems within the school setting are essential in order to ensure that students and staff with asthma receive necessary care and support.

The California Department of Education (CDE) supports a Coordinated School Health Program (CSHP) approach to student health. CSHP addresses the complex problem of asthma in schools by focusing on eight components that depend upon active involvement of school personnel, students, health care workers, and communities; CDC has developed a comprehensive model for addressing asthma in schools based upon the CSHP (Figure 10. Strategies for Addressing Asthma within a Coordinated School Health Program).

Asthma protective policies are essential for the school setting. The California Education Code includes some regulations related to asthma and student health in general; however, health policy is more fully developed at the district level. In recent years, several key statewide health protective policies were established. For example: CDPH and CDE approved *Guidelines for the Management of Asthma in California Schools*, a comprehensive resource for school health and other personnel to address asthma in the school setting;[38] State law now provides that with parental and health care provider permission, children are allowed to self-carry and self-administer asthma inhalers while at school;* and other legislation requires that new schools cannot be built within close proximity to certain stationary pollution sources.†

* Self-administered asthma medication law: California Education Code Section 49423.1

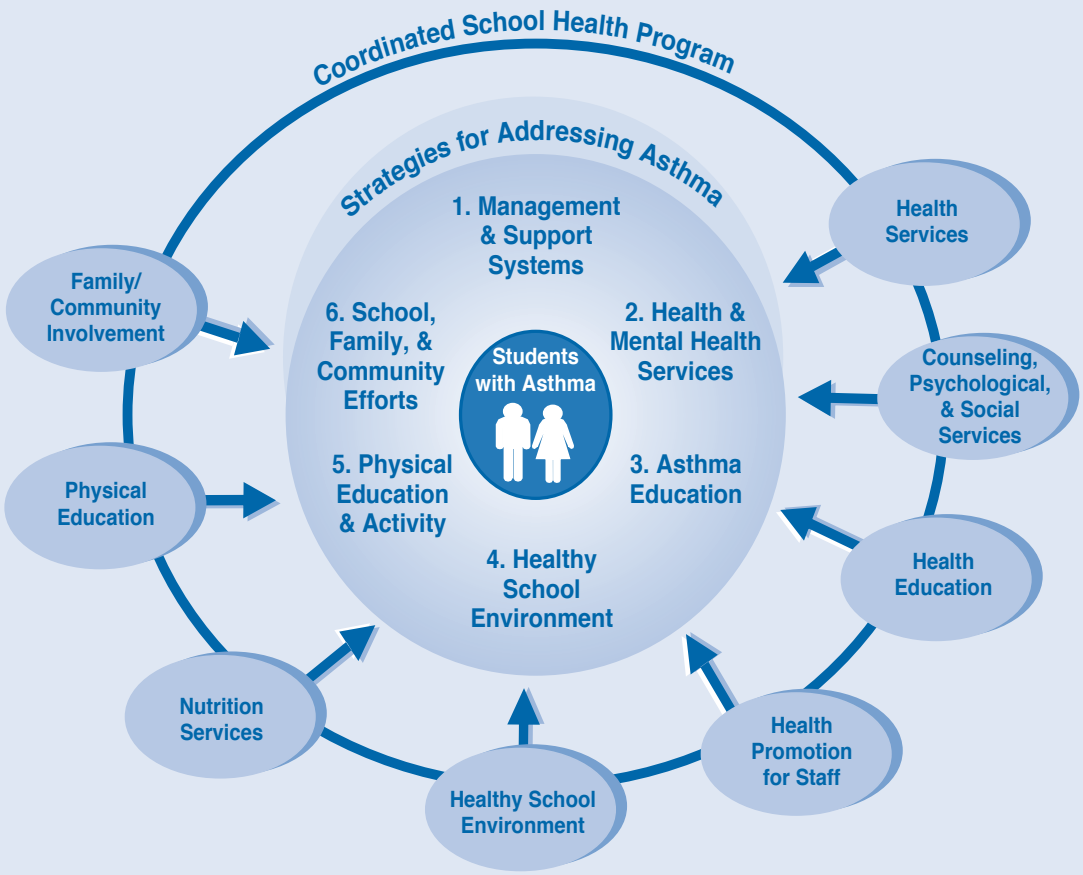
† Siting of schools away from pollution sources: Education Code Section 17213 and Public Resources Code Section 21151.8

Figure 10. Strategies for Addressing Asthma within a Coordinated School Health Program

CDC has identified six strategies for schools and districts to consider as they develop coordinated plans for addressing asthma in schools. The six strategies for addressing asthma within a coordinated school health program are:

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

Although considerable progress has occurred, further efforts are needed. While the *Plan* primarily addresses the public school system, private schools may also identify opportunities for improvements. By implementing the school specific objectives and strategies in this *Plan*, California will establish and implement comprehensive asthma policies and procedures for schools; assess schools to identify gaps and priorities; evaluate compliance with existing laws and regulations; increase the number of qualified school health personnel; and support comprehensive staff training on asthma and indoor air quality.

Objectives and Strategies

4A.1. Establish comprehensive and coordinated asthma policies and procedures in school districts to ensure the health and well-being of students with asthma.

4A.1.1. At the state level, collaborate with other agencies to develop a comprehensive set of model asthma policies and procedures for school districts based on existing best practices in the field and best practice guidelines. (Figure 11. Model Asthma Policies and Procedures for Schools).

4A.1.2. At the district level, encourage adoption of existing best practices for the design, construction and renovation of schools that ensure optimal indoor environmental quality.

4A.1.3. Coordinate a statewide schools asthma workgroup to advise on implementation of asthma reduction strategies, with emphasis on school facilities, health and safety, and operations. The workgroup could be composed of staff from state agencies (see Goal 1, Strategy 2.2) and augmented by non-governmental groups such as nursing associations, health care provider organizations, school based health center staff, teacher associations, facility managers associations, risk managers, and key asthma and environmental coalitions.

4A.1.4. Support efforts to identify pre-existing and develop new sources of adequate stable, long-term funding for school construction, renovation and preventive maintenance.

4A.1.5. Work with state school construction agencies and district facilities managers to adopt construction and maintenance specifications that reduce asthma exposure risks for use in school operation, renovation, and new construction.

4A.1.6. Support adoption of environmentally preferable purchasing practices for products and services that reduce asthma exposure risks including products with low exposure potential to allergens and asthmagens.

Sample Performance Indicators

Progress by a multi-agency school asthma workgroup to update the Guidelines for Management of Asthma in California Schools to include a model set of asthma policies and procedures.

A measured increase over time in school districts adopting one or more asthma-related policies included in the Guidelines.

The widespread use of the state's Environmentally Preferable Products (EPP) guidelines by school districts in their purchase of asthma-friendly products.

Figure 11. Model Asthma Policies and Procedures for Schools

School asthma policies establish practices to reduce asthma trigger exposures in the school environment and to improve treatment and management for students with asthma. CDC has developed a comprehensive model for addressing asthma within a coordinated school health program (Figure 10). This model contains six broad strategies for schools and districts to consider as they develop coordinated plans for addressing asthma in schools. Every strategy may not be appropriate or feasible for every school to implement; schools and districts need to determine their highest priorities based on the needs of the school and available resources.

1. Establish management and support systems for asthma-friendly schools. Some suggested policies include:
   - Identify your school's or district's existing asthma needs, resources, and potential barriers.
   - Identify students with asthma to ensure appropriate control and management.
2. Provide appropriate school health and mental health services for students with asthma. Some suggested policies include:
   - Obtain asthma action plans for students with diagnosed asthma.
   - Standardize emergency protocols for students in respiratory distress.
   - Ensure access to asthma medications; develop student self-carry policy.
   - Ensure acceptable staffing ratios for nursing and other health staff, and maintenance and facility staff.
3. Provide asthma education and awareness programs for students and school staff. Some suggested policies include:
   - Regular staff and student education regarding asthma symptoms, triggers, and treatment.
   - Integrate asthma awareness lessons into health education curricula.
4. Provide a safe and healthy school environment to reduce asthma triggers. Some suggested policies include:
   - Mitigate the risk of exposure to diesel exhaust for students and staff in schools located close to busy roadways or idling vehicles.
   - Purchase new school bus fleets and/or retrofit existing fleets with the latest clean vehicle and/or low-emissions technologies.
   - Develop a comprehensive Indoor Air Quality Management Plan to prevent and manage indoor air quality problems in schools.
   - Implement facility design, operations, and maintenance procedures to ensure safe and healthy indoor environments for students and staff.
   - Plant allergen-free or low-allergen landscaping around schools.
5. Provide safe, enjoyable physical education and activity opportunities for students with asthma. Some suggested policies include:
   - Encourage full participant in PE when well and provide modified activities as appropriate.
   - Develop school site plan for implementing alternative activities and protocols on bad air days.
6. Coordinate school, family, and community efforts to better manage asthma symptoms and reduce school absences among students with asthma. Some suggested policies include:
   - Ongoing communication procedures between the school, the student's medical provider, and the parents/guardians of the student with asthma.

For a full list of strategies, go to: www.cdc.gov/HealthyYouth/asthma/strategies.htm

4A.2. Assess schools/district compliance with existing codes and best practices that impact asthma, and ensure that laws and regulations adequately address indoor environmental quality issues and asthma management in schools.

4A.2.1. Develop environmental and asthma health elements for CDE to include in the School Assessment Report Cards (SARC) school safety section.[39]

4A.2.2. Monitor the implementation of and compliance with laws and regulations to ensure asthma friendly school environments, e.g., School Bus Idling law;* asthma medication law,† etc.

4A.2.3. Evaluate adequacy of existing laws and regulations to address asthma and indoor air quality issues in schools.

4A.2.4. Identify schools and districts in greatest need of health hazard remediation by reviewing SARCs and/or other facility assessments.

Sample Performance Indicator

The adoption of new tools, such as environmental and asthma-related SARC elements, in the annual assessment of schools.

4A.3. Increase the number of qualified personnel in schools and districts to better meet the needs of students with asthma.

4A.3.1. Increase the nurse-to-student ratio in all California school districts to more closely approach recommended ratios‡ and at a minimum, ensure that schools have a trained, certified health assistant or community health worker on-site during each school day.

4A.3.2. Work with the California School Health Centers Association to ensure that existing and future School-based Health Centers provide comprehensive, high quality asthma care, including acute and emergency care for all students with asthma.

4A.3.3. Promote the use of consulting community physicians within every school district to provide advice on appropriate management of asthma and other medical conditions.

4A.3.4. Increase custodial maintenance and facility staffing levels in school districts to approach optimal levels recommended by the California Association of School Business Officials.[40]

Sample Performance Indicator

The increase in school/district staffing levels for health professionals and facility maintenance in high-need school districts.

* School bus idling: California Code of Regulations (CCR) Chapter 10, Article 1, Section 2480, title 13 www.arb.ca.gov/regact/sbidling/fro.pdf

† Self-administered asthma medication law: California Education Code Section 49423.1

‡ The Healthy People 2010 goal is to have one nurse per every 750 students. The following organizations recommend a nurse in every school: the National Association of School Nurses, Centers for Disease Control and Prevention, the National Heart Lung Blood Institute, the American Academy of Pediatrics, and the American School Health Association.

4A.4. Institute targeted and specialized trainings for all district personnel on asthma and on environmental factors that impact asthma in schools; include health personnel, administrators, teachers, front office staff, coaches, maintenance and facility personnel, food preparation workers, and bus drivers.

4A.4.1. Utilize professional development institutes, and/or other pre-existing opportunities to educate staff about key asthma issues including asthma symptoms, treatment, emergency response, and environmental trigger mitigation strategies.

4A.4.2. Identify and use best practice asthma and indoor environmental quality training curricula and tool kits. Explore the possibility of developing an e-curriculum on asthma, with Continuing Education Units (CEUs) or contact hours (CH), for school personnel.

4A.4.3. Provide training for district administrators and facilities staff on US EPA's HealthySEAT and Indoor Air Quality Tools for Schools, and Collaborative for High Performance Schools resources to promote systematic school assessments and to track, assess, and build indoor air quality management plans based on identified needs (Figure 12. Implementing an Indoor Air Quality Management Plan in Schools).

Sample Performance Indicator

The availability of annual asthma and indoor air quality training for the various school staff classifications.

Figure 12. Implementing an Indoor Air Quality Management Plan In Schools

There are several resources currently available that can help schools develop their Indoor Air Quality (IAQ) Management Plan, including:

IAQ Tools for Schools (TfS): Developed by the U.S. EPA, the IAQ TfS comes as a kit to show school personnel how to conduct a practical plan of action to improve indoor air quality and address problems. The Kit provides best practices, industry guidelines, sample policies, and a sample IAQ management plan, and includes low and no cost approaches for in-house staff to employ (www.epa.gov/iaq/schools/actionkit.html).

Healthy School Environments Assessment Tool (HealthySEAT): HealthySEAT is a free software tool, also developed by U.S. EPA, to help school districts more effectively manage all of their environmental issues. HealthySEAT is designed to be customized by districts to conduct and manage self-assessments of their school facilities and environmental, health, and safety issues (www.epa.gov/schools/healthyseat).

The Collaborative for High Performance Schools (CHPS): CHPS works with districts to facilitate the design and construction of high performance schools; that is, schools with optimal energy and resource efficiencies, plus indoor air quality, comfort, and lighting to enhance the learning environment. CHPS offers trainings and resources to schools, and sponsors recognition and certification programs focused on healthy school construction and repair (www.chps.net).

4A.5. Minimize exposure to contaminated outdoor air and promote safe and healthy outdoor school environments.

- 4A.5.1. Develop and promote guidelines on low-allergen landscaping practices for schools.
- 4A.5.2. Promote school site guidelines to reduce their proximity to busy roadways and other diesel or pollutant sources.
- 4A.5.3. Encourage school districts to adopt policies for managing outdoor activities on bad air days, including for children with respiratory diseases.
- 4A.5.4. Promote diesel exhaust exposure reduction at school sites, such as retiring and/or retrofitting existing fleets with the low-emissions technologies and adherence to laws restricting school bus idling.

Sample Performance Indicator

The increase in school districts with outdoor air pollution exposure reduction policies.

B. Child Care

Overview

Asthma is highly prevalent in children aged 0–5 years and children in this age group have the highest rates of emergency department and hospital visits for asthma. In California, nearly 50,000 licensed child care centers, preschools, and family child care providers serve over 1 million children.[41] Many other young children attend license-exempt facilities which are not covered under regulations that apply to licensed settings. Both types of child care are addressed in this *Plan*. With some children spending up to 60 hours a week in child care settings, it is critical that each of these settings provides a healthy and safe environment for all children, especially children with special health care needs such as asthma. Uncontrolled asthma symptoms may interfere with the physical, social, and emotional development of children.[42]

While child care facilities encounter many of the same challenges that confront schools, there are many issues and concerns that are unique to this setting and age group. In 2002, CDPH surveyed center-based site directors, teachers and providers to assess asthma knowledge and the presence of triggers. The survey results indicated that environmental risk factors are commonly present in child care centers and that knowledge among child care staff about asthma varies widely.[43] In recent years, several prominent organizations in California have collaborated to develop high quality asthma education and training materials specifically for early care and education providers in California. One example is the video, *Asthma Care Training for Child Care Providers*, which was produced in both English and Spanish by Emergency Medical Ser-

vices Authority (EMSA).[44] In addition, national health professional organizations have developed specific key recommendations for making child care safer for children with asthma. Addressing asthma-related environmental issues within the many diverse child care settings will require continued coordination and outreach at many levels.

Success in meeting the child care objectives and strategies will result in better policies and practices that encourage safer child care environments for infants and young children with asthma; consistent education for staff to recognize asthma and respond effectively; and new resources to sustain and disseminate these advances.

Objectives and Strategies

4B.1. Ensure the health and well-being of children with asthma in child care settings through a set of comprehensive and coordinated asthma policies and procedures.

4B.1.1. At the state level, develop and promote guidelines and training on the management of asthma in child care settings and trigger reduction strategies. Include a comprehensive set of model policies and procedures (Figure 13. Model Asthma Policies and Procedures for Child Care Centers).

4B.1.2. Tailor outreach materials and training to child care providers in a variety of settings (e.g., rental facilities, churches, schools, homes, centers) to encourage the adoption of model policies.

4B.1.3. Increase state funding to support child care services, facilities improvements, and appropriate health and safety training.

Sample Performance Indicator

Progress in the development of state guidelines and training curriculum on asthma management in child care settings.

4B.2. Increase the availability of child care health consultants, health personnel and technical assistance resources to help child care providers manage asthma.

4B.2.1. Increase the number of child care health consultants and/or nurses in all counties as a training and technical assistance resource for licensed child care facilities.

4B.2.2. Establish linkages between the child care, health care, and school communities to provide clinical and health education consultation services as needed.

Sample Performance Indicator

Increases in numbers of childcare health consultants and health personnel providing assistance to child care providers.

4B.3. Work with the California Department of Social Services (Community Care Licensing) to ensure that laws and regulations for licensed child care facilities

Figure 13. Model Asthma Policies and Procedures for Child Care Centers

The American Public Health Association (APHA) and the American Academy of Pediatrics (AAP) have jointly published Caring for Our Children: National Health and Safety Performance Standards: Guidelines for Out-of-Home Child Care Programs (http://nrc.uchsc.edu/CFOC). This report includes six key recommendations for making child care centers safer for children with asthma that are adapted as follows:

1. Each child with asthma should have a special care plan prepared for the facility by the child's source of health care, to include:
   - Written instructions regarding how to avoid the conditions that are known to trigger asthma symptoms for the child;
   - Indications for treatment of the child's asthma in the child care facility;
   - Names, doses, and method of administration of any medications, e.g., inhalers, the child should receive for an acute episode and for ongoing prevention; and
   - When the next update of the special care plan is due.
2. Based on the child's special care plan, the child's caregivers should receive training, demonstrate competence in, and implement measures for:
   - Preventing exposure of the asthmatic child to conditions likely to trigger the child's asthma;
   - Recognizing the symptoms of asthma; and
   - Treating acute episodes.
3. Parents and staff should arrange for the facility to have necessary medications and equipment to manage the child's asthma while the child is at the child care facility;
4. Properly trained caregivers should promptly and properly administer prescribed medications according to the training provided and in accordance with the special care plan;
5. The facility should notify parents of any change in asthma symptoms when that change occurs.
6. The facility should reduce these common asthma triggers by:
   - Encouraging the use of allergen impermeable nap mats or crib/mattress covers;
   - Prohibiting pets (particularly furred or feathered pets);
   - Prohibiting smoking inside the facility or on the playground;
   - Discouraging the use of perfumes, scented cleaning products, and other fumes;
   - Quickly fixing leaky plumbing or other sources of excess water;
   - Ensuring frequent vacuuming of carpet and upholstered furniture at times when the children are not present;
   - Storing all food in airtight containers, cleaning up all food crumbs or spilled liquids, and properly disposing of garbage and trash;
   - Using integrated pest management techniques to get rid of pests (using the least hazardous treatments first and progressing to more toxic treatments only as necessary); and
   - Keeping children indoors when local weather forecasts predict unhealthy ozone levels or high pollen counts.

Source: http://nrc.uchsc.edu/CFOC/

For more information on healthy child care, visit: www.nccic.org/hcca/

adequately address asthma-related and indoor environmental quality issues, that education about laws is sufficient, and that regulations are enforced.

4B.3.1. Engage interested stakeholders to evaluate existing laws and regulations to determine their adequacy for addressing asthma-related and indoor environmental quality issues in licensed child care facilities. Recommend changes and new laws/regulations as appropriate.

4B.3.2. Assess whether licensed child care centers and family child care homes meet all relevant laws and regulations. Expand support resources to help licensed child care facilities comply (Figure 14. Legal Protections Afforded to Children with Asthma).

Sample Performance Indicator

Progress by a multi-agency child care asthma workgroup to develop an instrument for assessing compliance with existing child care facility and environmental regulations.

Figure 14. 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.usdoj.gov/crt/ada/childq&a.htm.

California Law

While limited, 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 day care are noted where applicable.

Trigger Reduction

- Pest management and pesticide use: 22 CCR 101238(a)(1) states that the licensee shall take measures to keep the center free of flies, other insects and rodents. In 2006, the "parents' right-to-know" law about pesticide application at school sites (California Education Code Section 17610-17612) was extended to licensed day care facilities. This regulation also requires the Department of Pesticide Regulations to send licensed facilities information on Integrated Pest Management (IPM). Family day care centers are exempt from the reporting requirements, but do receive the IPM information.
- Smoking: Health and Safety (H&S) Code section 1596.795(b) bans smoking anywhere on day care premises. Family day cares are required to prohibit smoking only when children are present.

Treatment, Management, and Staff Training

- Section 1596.798 of H&S Codes gives child care staff permission to administer inhaled medications. It also requires any licensee or staff person who obtains or renews a pediatric first aid certificate to complete formal training in how to administer inhaled medication to children with respiratory needs.

4B.4. Minimize exposure to contaminated outdoor air and promote safe and healthy child care facility outdoor environments.

4B.4.1. Establish and communicate guidance for child care centers and family child care homes on best practices for recognizing and managing unhealthy air quality days for children with respiratory diseases and all children.

4B.4.2. Consider the development of guidelines for locating new licensed child care centers as far as possible from sources of outdoor air pollution such as freeways, busy roads, and stationary pollution sources (similar to existing regulations for new school construction).

4B.4.3. Promote low-allergen landscaping practices for child care settings.

Sample Performance Indicator

Progress by a multi-agency child care asthma workgroup to issue guidance and best practices for child care facilities.

C. Homes, Housing, and Institutional Care Settings

Overview

Californians reside in a variety of housing structures, with 66 percent living in a house, 30 percent living in multi-unit buildings, and almost four percent living in mobile homes. The majority of Californians own their own homes (56 percent) while most of the rest rent (40 percent). African American and Latino populations are more likely to live in multi-unit structures. Overall, Californians with higher incomes tend to live in houses, and Californians with lower incomes tend to live in multi-unit structures.[45]

The physical places where individuals sleep and live may actually present serious health challenges for people with asthma. Frequently, people with asthma are exposed to a variety of asthma triggers at home (Figure 15. Home Asthma Triggers). In general, people who rent and who live in multi-unit buildings have less control over their environments and the triggers impacting their asthma than people who own and live in houses. While asthma triggers are common in most homes, low-income people may be exposed to additional triggers as a result of poor housing conditions.

There are hundreds of excellent programs already in place throughout the state designed to help people with asthma reduce triggers in their home environment. These range from asthma home visitor programs that educate people about strategies they can use to reduce triggers, to important partnerships between code enforcers and health departments that seek to interpret building codes in a more health protective way. For example, smoke-free multi-unit housing is a priority of the CDPH's Tobacco

Figure 15. Home Asthma Triggers

- Secondhand smoke
- Indoor mold and moisture
- Consumer products and personal care products with chemical irritants
- Furry and feathered pets
- Dust mites
- Cockroaches and rodents
- Combustion products (NO_2)
- Plant pollens
- Cold air
- Roadways, air pollutants, and ozone

Control Section and their many state and local partners. Nonetheless, greater assistance is needed for many individuals with asthma in resolving indoor environmental issues.

The Homes, Housing, and Institutional Care Settings objectives of the *Strategic Plan* address the need to greatly minimize asthma exacerbations from residential exposures. One strategy includes research to improve understanding of asthma triggers. Efforts are proposed in the area of building standards, guidelines and model codes. Educating all stakeholders in the housing industry, including tenants, is necessary to identify and reduce potential risks. Greater assistance for individuals with asthma in resolving indoor environmental issues is recommended. Finally, it will be important to address populations living in foster care, group homes, correctional facilities, nursing homes, mental health institutions, and other institutional care settings.

Objectives and Strategies

4C.1. Improve understanding of asthma trigger exposures in home environments and assess effectiveness of exposure reduction interventions, e.g., the problem of secondhand smoke in multi-unit housing environments.

4C.1.1. Partner with research organizations on studies of asthma trigger sources, building sciences, and housing policy. Identify and assess effective controls and interventions aimed at reducing indoor exposures in the home environment.

4C.1.2. Develop and promote health protective guidance and standards based on assessment of home exposure reduction interventions.

Sample Performance Indicators

Ongoing collaboration on one or more research grant/contract(s) or interagency agreement(s) with University of California, U.S. EPA, and/or Department of Energy laboratory.

Ongoing collaboration on one or more demonstration project(s) to assess controls and interventions aimed at reducing indoor exposures in the home environment.

4C.2. Develop and promote standards, guidelines and model policies for asthma-safe healthy housing that minimize indoor environmental risk factors that contribute to asthma.

4C.2.1. Assess existing standards, guidelines, and model policies to determine the adequacy of these standards to address the environmental risk factors in housing that contribute to asthma. Additionally, assess how and to what extent the standards are being enforced at the local level.

4C.2.2. Identify, develop and promote new standards or guidelines for the design, construction, renovation, and maintenance of asthma-safe healthy housing.

4C.2.3. Develop and promote guidance to reduce exposures to outdoor air pollution in and around housing, including building design practices and technologies to reduce pollutants entering buildings, and land-use planning to further distance residencies from major roadways and stationary sources.

4C.2.4. Partner with public and affordable housing to promote and advocate for increasing the number of asthma-friendly housing units available. Consider building support around volunteer local and state policies requiring a certain percentage of public and affordable housing be asthma-friendly.

4C.2.5. Ensure state and local governments have adequate infrastructure and funding for housing code enforcement.

Sample Performance Indicator

Progress by CDPH, in partnership with housing and asthma stakeholders, towards issuing new asthma-safe healthy housing guidelines that address indoor and outdoor air quality issues.

4C.3. Educate various stakeholder groups on the importance of reducing indoor environmental risk factors in housing that contribute to asthma.

4C.3.1. Identify and develop, as needed, educational materials for stakeholders that highlight indoor air quality risk factors and how to reduce these risk factors. Stakeholders include tenants, landlords, property managers, maintenance/facilities personnel, developers, builders, architects, insurers, and lenders (Figure 16. Asthma-friendly Housing Checklist).

4C.3.2. Develop and implement appropriate outreach mechanisms to distribute the material referred to in the previous strategy. This could include train-

Figure 16. Asthma-friendly Housing Checklist

- Keep the home and car smoke-free
- If an individual is sensitive to a pet, the best treatment is removal of the pet exposure from the home
- Minimize use of cleaners near persons with asthma
- Use heating system with high efficiency filtration; use exhaust fan while cooking
- Monitor use of gas-fired and solid-fuel stoves and hearth appliances
- Cover mattresses and pillows with allergen-proof covers; launder bedding with hot water
- Choose flooring, carpeting, and furnishings that can be effectively cleaned to minimize dust burden
- Limit the number of stuffed toys in child's bed and sleeping area.
- Use air conditioning or dehumidifiers in humid areas (i.e., keep relative humidity below 60 percent)
- Repair leaks as soon as possible, and clean-up indoor mold before applying new flooring and wall surfaces
- Use integrated pest management practices; clean-up food crumbs and pest droppings as soon as possible
- Select low-allergen landscaping
- On bad air quality days, limit physical exertion outdoors

ings and outreach activities to the various stakeholder groups and incentives to public housing programs to distribute materials to their tenants.

Sample Performance Indicator

Guidance and standards developed, adopted, and communicated to constituent groups.

4C.4. Ensure healthy home environments for people with asthma through augmentation of home assessments, remediation, and legal advocacy.

4C.4.1. Encourage building inspectors to expand in-home environmental assessment programs for individuals with persistent or high-risk asthma.

4C.4.2. Work with legal groups to increase legal advocacy services and programs for tenants with asthma who live in unhealthy housing conditions.

4C.4.3. Collaborate with physician groups to train medical providers to assist patients with housing requests, such as a "physician verification letter."

4C.4.4. Work with planning, building inspection, and other appropriate groups to ensure that laws adequately address environmental asthma risk factors.

Sample Performance Indicator

Increase in number of in-home environmental assessments by local building inspectors and legal advocacy services for tenants with asthma.

4C.5. 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.

4C.5.1. Partner with the California Department of Social Services (Foster Care Branch and Community Care Licensing) to provide educational resources to care providers and foster care public health nurses on the recognition, prevention, and management of asthma among children under their care, and on the identification and reduction of indoor asthma triggers in their institutions. Ensure that children living in foster care are not exposed to secondhand smoke.

4C.5.2. Partner with California Department of Corrections and Rehabilitation on the recognition, prevention, and management of asthma among inmates, and on the reduction of indoor asthma triggers in their institutions.

4C.5.3. Partner with California Department of Mental Health on the recognition, prevention, and management of asthma among patients, and on the reduction of indoor asthma triggers in their institutions.

Sample Performance Indicators

Interagency partnerships established to issue asthma trigger reduction guidance for institutional-care settings (child cares, foster homes, prisons, mental hospitals).

Dissemination of educational materials for home-care providers, for corrections officers, and for mental health workers regarding recognition and management of asthma and indoor asthma triggers.

D. Workplace

Overview

Work-related asthma (WRA) is asthma that is caused or triggered by conditions or substances in the workplace, and is a significant public health problem. It includes new onset asthma, or asthma that newly develops from workplace exposures, as well as pre-existing asthma that is exacerbated by conditions in the workplace.

It is estimated that between 137,000 and 315,000 adults in California have work-related asthma.[46] Surveillance data show that among people with WRA, 62 percent were either unable to perform their usual work or had to perform modified work, and 34 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 an average of four times since their breathing problems at work began.[47] It is known that current surveillance efforts underestimate the extent of WRA.[48]

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 exposures shared by workers and the general public in common environments such as schools, hospitals, and government buildings.

Accomplishment of the WRA objectives will improve data collection, surveillance, evaluation, and use. Prevention strategies would be promoted and implemented. Collaboration with and education of health care providers, employers, workers, communities, and regulatory agencies are also recommended.

Objectives and Strategies

4D.1. Improve data collection, surveillance, and evaluation of data on WRA, and ensure data are used for prevention

4D.1.1. Maintain statewide surveillance for WRA (Figure 17: Current Work Related Asthma Surveillance Data Sources).

4D.1.2. Identify ways to increase reporting of WRA by health care providers as required.*

4D.1.3. Expand surveillance to include new data sources by evaluating, validating, and when appropriate adding new data sources. Characterize populations of workers that are not in the current surveillance system.

4D.1.4. Utilize surveillance data to focus prevention efforts by identifying high-risk industries, occupations, worksites, and exposures.

4D.1.5. Increase access and usefulness of WRA surveillance data by preparing and disseminating annual reports on current incidence, prevalence and trends. Post work-related asthma surveillance data on the web.

Sample Performance Indicator

Increase in data sources available to identify cases of WRA.

Figure 17. Current Work-Related Asthma Surveillance Data Sources

Doctor's First Reports of Occupational Injury or Illness (DFR) have been collected and entered into the system since 1993. As of January 2007, over 3,700 reports of WRA are in the system. DFR's must be completed by all health care providers when an injury or illness is suspected to be work-related.

Hospital discharge data are currently being evaluated and included in the system if confirmed, beginning with 2003 data.

Data from the Worker's Compensation Information System are also currently being evaluated for possible inclusion in the system.

All cases identified through any data source receive follow-up in the form of an attempted telephone interview, and in some cases review of medical records.

* Doctor's First Report of Occupational Injury or Illness: Labor code 6409(a)

4D.2. Develop and implement strategies to prevent WRA

4D.2.1. 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.

4D.2.2. Promote the use of controls in the workplace to reduce or eliminate exposures, including the substitution of sensitizers and asthma triggering substances with safer alternatives, the implementation of engineering and administrative controls, and as a last resort, appropriate use of personal protective equipment.

4D.2.3. Promote the inclusion of asthma prevention and medical surveillance in workplace Illness and Injury Prevention Programs (IIPPs).*

4D.2.4. Encourage prevention in specific industries by demonstrating its benefits to employers. Develop corporate social responsibility guidelines on WRA for use in the private sector.

4D.2.5. Work with Cal/OSHA to consider the potential of regulated chemicals to cause asthma or respiratory sensitization when setting standards. Train Cal/OSHA staff on how to include respiratory sensitization in their worksite assessments and make recommendations to prevent it.

4D.2.6. Implement 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.

4D.2.7. Support local law enforcement to improve compliance with the workplace smoking ban.†

4D.2.8. Support efforts to reduce asthma irritants (e.g., perfumes, scented cleaning agents, chemical food scents, etc.) in the workplace through targeted information to employers and employee groups.

Sample Performance Indicators

Number of focused evaluation and prevention efforts in different industries at high-risk for work-related asthma.

Progress in development of model language for asthma prevention and medical surveillance for adoption in IIPPs by employers.

4D.3. Increase awareness and knowledge about WRA and its prevention among health care providers, employers, workers and communities

4D.3.1. Identify existing education opportunities targeted to health care providers and assess whether and how to incorporate information on WRA. Materials and trainings could include: asthmagenic exposures in the workplace, guidelines and tools for evaluation and diagnosis of WRA, reporting

* Cal/OSHA requirement for Injury and Illness Prevention Programs: T8 CCR Sections 3203, 1509 of the General Industry Safety Orders www.dir.ca.gov/dosh/dosh_publications/iipp.html

† Second-hand smoke bans: California State Labor Code 6404.5; Government Code 7596–7598, 19994.30, and 19994.33.

requirements for workplace illness, and resources for WRA, among others. Explore incorporating WRA into existing medical school curricula.

4D.3.2. Conduct outreach and education directed at workers in high-risk industries, occupations, worksites, and exposures as identified through surveillance data.

4D.3.3. Encourage the utilization of existing resources (e.g., employee health clinics) in the workplace for outreach and education to workers regarding WRA.

4D.3.4. Develop and distribute linguistically and culturally appropriate educational materials on WRA for workers, including workers reported to the WRA surveillance system.

4D.3.5. Collaborate with unions, work centers, and other labor oriented sites to distribute materials and conduct training about WRA to workers. Provide information on asthma and asthma risk factors to the self- employed work force such as house cleaners and day laborers.

4D.3.6. 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, interventions, and to collaborate on trainings for employers.

4D.3.7. Collaborate with groups working in the community on asthma prevention and disparities to include WRA in their efforts (agencies, coalitions, health centers, schools, and non-governmental organizations).

Sample Performance Indicator

Educational materials on WRA provided to health care providers associated with the California Medical Association, the California Nurses Association, and other medical professional organizations, and to workers identified through the WRA surveillance system.

GOAL 5: Outdoor Environment

Goal Statement

A healthy and safe outdoor environment will exist for all Californians, with a particular a focus on optimizing respiratory health.

Overview

There is increasing awareness of the many effects of the outdoor environment on people with asthma. Disproportionate exposures and impacts occur in communities with higher proportions of people of low income or from racial and ethnic minorities, a phenomenon which contributes to disparities in asthma prevalence and outcomes.

Many factors lead to outdoor air exposures that can contribute to the causation of asthma or exacerbate pre-existing asthma. For example, the "goods movement industry" is responsible for much diesel pollution. There are increasing numbers of ships anchored near or docked in enlarging California ports that expose people to increased amounts of diesel pollution. In turn, vast numbers of diesel trucks line up and idle at these ports to pick up and transport goods to warehouses further inland.

Individual dependence on the automobile has been associated with more vehicles, longer miles traveled in cars, and subsequent increased traffic pollution. Agricultural practices and forestry practices may increase dust and particulates, or airborne pesticides in surrounding communities. The energy sector produces particulates, sulfur oxides, nitrogen oxides, and other respiratory irritants through combustion of fossil fuels, which contributes to the mix of pollutants that adversely affect people with asthma

Goal 5 contains objectives to decrease air pollution as well as other asthma "triggers." The objectives address not only issues whose remediation may cause relatively rapid improvements in asthma prevalence or severity but also "upstream" issues (e.g., a paucity of alternative energy sources) whose remediation may not affect asthma rates for years or decades. Improvement in some areas, such as increasing use of bicycles and walking, may favorably impact physical activity, nutrition, obesity, diabetes, and other health conditions in addition to asthma.

Objectives and Strategies

5.1. Support policies and community plans that improve conditions for people with asthma.

5.1.1. Use Public Health Impact Assessments (PHIA) in community general plans, and ensure that asthma is included in the PHIAs, and in the California Environmental Quality Act (CEQA) process.[49]

5.1.2. Assist with development and improvement of asthma indicators in PHIAs and in the CEQA process.

5.1.3. Support transportation and land use plans and develop model policies that reduce car use and increase use of public transportation, bicycles and walking.

5.1.4. Develop partnerships with groups and agencies that promote pollution-reducing transportation plans and encourage partnerships that support and influence use of resources to expand bicycling\walking options for activities of daily life.

5.1.5. Support efforts to study existing opportunities for alternative energy and make recommendations.

5.1.6. Support community efforts to adopt public transportation plans that utilize "green technology" and "clean energy" vehicles that produce low levels of air pollutants.

5.1.7. Promote and support use of solar energy.

5.1.8. Support strategies such as use of biodiesel, compressed natural gas, carbon tax, greenhouse gas offset purchases, and use of appliances that are energy efficient.[50]

5.1.9. Identify the asthma triggers associated with landscaping (for example, pollen as major organic\biologic trigger) and promote low allergen landscaping around public and private properties.

5.1.10. Increase the capacity\numbers of people who have the skills and knowledge to evaluate landscapes and to redesign them so they are low allergy landscapes.

5.1.11. Ensure that state properties, schools, hospitals, convalescent homes, medical centers, parks and public spaces have allergy-free or low pollen landscaping.

5.1.12. Endorse a pollen control ordinance by the state.

Sample Performance Indicators

CDPH completes a guidance document on Health Impact Assessments that includes asthma indicators and examples of successful use in various California communities.

CDPH prepares a collection of examples of community general plans and model policies that reduce car use and increase use of public transportation, bicycles and walking.

CDPH completes a guidance document on low allergy landscaping.

5.2. Ensure public awareness, participation and transparency in public policy decisions and improve communication between Air Quality Management Districts (AQMDs) and the communities that they serve.

5.2.1. Cultivate leadership in pollution-affected communities by identifying and partnering with current asthma champions and working with environmental justice advocates and with existing coalitions to increase awareness of potential policy decisions and encourage participation at all levels of decision making.

5.2.2. Conduct a public education campaign with consistent messages related to asthma and the outdoor environment, including recommendations for appropriate individual, institutional, or policy action in relation to the Air Quality Index (AQI).[51]

5.2.3. Support consistent policies for all AQMDs in relation to air quality monitoring, issuing air alerts in response to unhealthy AQI, and methods for alerting the public to poor air quality.

5.2.4. Support consistent statewide policies for enacting "spare the air" days and funding free public transportation on affected days.

5.2.5. Support efforts to develop funding for adequate air monitoring station capability in all AQMDs that includes population areas impacted by asthma disparities.

Sample Performance Indicators

CDPH works with the California Air Resources Board (CARB) to provide information on the AQI and how to use it in communities to benefit people with asthma.

CDPH provides map of air quality monitoring stations in its *County Asthma Profiles*.

5.3. Target the elimination of disproportionate exposure to outdoor air pollution among specific groups or communities.

5.3.1. Systematically identify communities that are disproportionately affected by air pollution from nearby sources such as industry, airports, mobile sources, and agricultural lands.

5.3.2. 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 the disparities.

5.3.3. Request regulatory agencies to consider the impacts of cumulative environmental exposures in policy setting.

Sample Performance Indictor

CDPH works with CARB to establish methods and air pollution criteria for identifying environmental justice sites.

5.4. Reduce air pollution from sources such as "goods movement" industries, stationary industries, and transportation.

5.4.1. Identify and report on environmental, social and health costs related to the "goods movement" industry.

5.4.2. Support policy that reduces the pollution from ships, trains, trucks, yard equipment at ports, rail yards, distribution centers, and heavily trafficked freeways and roads.

5.4.3. Support and strengthen air quality improvement plans at the ports of Los Angeles, Long Beach, Oakland, and other ports using a range of enforcement mechanisms such as economic assessments, fees, and penalties.

5.4.4. Partner with appropriate agencies to ensure identification of polluting industries and compliance with environmental laws.

5.4.5. Support policy that reduces industrial pollution from major stationary sources of air pollution.

5.4.6. Support the CARB on establishment and enforcement of diesel regulations, such as policies to reduce bus, truck, ship and train idling.*

5.4.7. Encourage the development of efficient and lower pollution impact truck and public transit routes.

5.4.8. Support efforts to re-engineer or upgrade city fleets, construction equipment, school buses, and heavy off road vehicles. Encourage schools and school districts to use low-emission buses and vehicles and abide by laws and guidelines such as the *Environmental Protection Agency Clean School Bus USA Guidelines*.

5.4.9. Support rigorous emission standards for all motor vehicles.

5.4.10. Work with the State and Consumer Services Agency, CARB, and local and regional air districts to identify activities and vehicles that are heavy emitters, and to prioritize, and regulate with best available technology, consistent with low emissions.

5.4.11. Support public reporting of vehicles and activities that are suspected of emission violations.

5.4.12. Support efforts to reduce levels of sulfur dioxide pollution from diesel fuel by transitioning to vehicles that are ultra low sulfur diesel (ULSD).

5.4.13. Support transition of commuter trains to low-polluting locomotive engines.

5.4.14. Discourage use of wood burning stoves and fireplaces through ordinances and public education.

5.4.15. Support other efforts to attain the National and State Ambient Air Quality Standards (NAAQS) for ozone, NO_2 and particulate matter.[52]

5.4.16. Support research and dissemination of findings about the connection between asthma and global warming and the need for reduction of greenhouse gases.

Sample Performance Indicator

Decreases in green house gases, criteria air pollutants, and diesel particulates.

5.5. Reduce worker and public exposures to asthma triggers related to agricultural practices, forestry practices and other outdoor workplaces.

5.5.1. Increase dust control measures with particular attention to no-till policies and seasonal activities such as harvest time.

5.5.2. Encourage alternative farming practices such as incentives for no-till; Integrated Pest Management (IPM) or organic farming.

5.5.3. Support research focused on identifying the pesticides in high use that can cause or exacerbate asthma and alternatives to use of pesticides.

5.5.4. Decrease exposure to particulates by minimizing agricultural burning and re-examining forest burning practices.

* Truck idling law: California Code of Regulations, Title 13, Division 3, Chapter 10, Article 1, Section 2485 www.arb.ca.gov/toxics/idling/regtext.htm

5.5.5. Support mandatory notification of pesticide use,* agricultural burning, etc., for schools and adjacent housing and other facilities to allow for protection of people with asthma in those areas. Support consistent enforcement of notification policies.

5.5.6. Support efforts to create transparency in decision making regarding roles and responsibilities of public officials (for example, the position of air pollution control officers and agricultural commissioners in counties being held by the same person).

5.5.7. Identify and target outdoor workplaces that have the potential for causing or exacerbating asthma.

5.5.8. Support policy efforts aimed at reduction of exposures to asthma triggers in identified outdoor workplaces (decrease dust, pesticide exposures, truck and bus idling, and allergenic landscaping).

Sample Performance Indicator

CDPH identifies pesticides that cause or trigger asthma.

Pesticide use reports demonstrate decreasing applications of asthma causing or asthma triggering pesticides.

5.6. Reduce youth and adult smoking rates and decrease exposure to secondhand tobacco smoke.

5.6.1. Promote policy and public education efforts to further reduce smoking prevalence and help people quit smoking (www.tobaccofreeCA.com).

5.6.2. Support efforts to reduce secondhand smoke exposure in multiple unit housing and other homes.

5.6.3. Reduce access to tobacco products by minors.

5.6.4. Ban outdoor smoking adjacent to public buildings, in public spaces and spaces adjacent to public transit waiting areas.

5.6.5 Reduce the presence of tobacco industry sponsorship at community events.

Sample Performance Indicators

More stringent statewide smoke-free policies and increasing number of communities adopting more stringent smoke-free ordinances.

State tobacco survey shows steady decline in youth and adult smoking rates.

* Notification of pesticide use in schools: Education Code, Sections 17608–17613

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Glossary of Terms and Acronyms

AAAAI: American Academy of Asthma, Allergy and Immunology (www.aaaai.org)

AAFA: Asthma and Allergy Foundation of America (www.aafa.org)

AAP: American Academy of Pediatrics (www.aap.org)

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 become worse than usual. Asthma action plans are usually split into Zones: Green Zone, Yellow Zone, and Red Zone.

Acute: Brief (days to weeks); sudden.

AE-C: Asthma Educator-Certified

Age-adjusted mortality rate: A mortality rate statistically modified to eliminate the effect of different age distributions in the different populations.

Airflow limitation: Includes the multiple mechanisms involved in the physiological abnormalities of asthma that affect the rate of airflow from the lungs; replaces other phrases such as "airway obstruction" and "airway narrowing" that imply specific mechanisms of airflow limitation.

Airway hyperresponsiveness: Describes airways that narrow too easily or too much in response to a provoking stimulus. In asthma, airways can be hyper responsive to many different stimuli.

ALA: American Lung Association (refer to www.lungusa.org)

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.

Anti-inflammatory to Bronchodilator ratio: An asthma-related quality measure that utilizes information on the ratio of anti-inflammatory to bronchodilator medications.

AOEC: Association of Occupational and Environmental Clinics (www.aoec.org)

Air Quality Index (AQI): A measure of the amount of the six major pollutants in the air. These pollutants are particulates, sulfur dioxide (SO_2), carbon monoxide (CO), nitrogen dioxide (NO_2), lead (Pb), and ozone (O_3). A measurement of 0 to 100 is considered acceptable, but from 100 to 150 is unhealthy for older adults, young children, and people with asthma. Above 150 is unhealthy for everyone.

AQMD: Air Quality Management District. A public agency that regulates the stationary sources of air pollution in a geographically defined area.

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.

Asthmagen: A substance that can cause new asthma in a person that previously did not have it.

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 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.

β2 agonist drugs: Also called beta 2 -agonist or beta-adrenergic agonist. Also written as beta-agonist or beta2-agonist. The most common type of bronchodilator medication. Albuterol is a beta-agonist, which is responsible for relaxing the airway smooth muscle (thereby opening the airways). A class of quick relief medications.

Biodiesel: A fuel or fuel additive that is typically produced through the reaction of a vegetable oil or animal fat with methanol. Its use can result in substantial environmental benefits.

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.

BPCA: Best Practices in Childhood Asthma program (www.dhs.ca.gov/ps/cdic/caphi and www.betterasthmacare.org)

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

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.

Bronchoconstriction: Airflow limitation due to contraction of airway smooth muscle. "Bronchoconstriction" replaces the word "bronchospasm."

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.

CAFA: Community Action to Fight Asthma (refer to www.calasthma.org)

Cal/OSHA: California Occupational Safety and Health Administration. Agency responsible for enforcing California workplace laws and regulations pertaining to workplace safety and health and for providing assistance to employers and workers about workplace safety and health issues.

CAP: California Asthma Partners (www.asthmapartners.org)

Capacity building: The process of building the potential for voluntary organizations to respond to the needs of the communities they serve.

CAPHI: California Asthma Public Health Initiative (www.dhs.ca.gov/ps/cdic/caphi and www.betterasthmacare.org)

CARB: California Air Resources Board (www.arb.ca.gov)

Carbon tax: A charge on fossil fuels (coal, oil, natural gas) based on their carbon content. When burned, the carbon in these fuels becomes carbon dioxide in the atmosphere, a significant greenhouse gas.

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.

CB: California Breathing (www.californiabreathing.org)

CBPR: Community-Based Participatory Research. A methodology that promotes active community involvement in the processes that shape research and intervention strategies, as well as in the conduct of research studies.

CCR: California Code of Regulations

CDC: Centers for Disease Control and Prevention

CDE: California Department of Education

CDPH: California Department of Public Health. One of the largest departments in California government whose mission is to protect and improve the health of all Californians. California Department of Health Services (CDHS) was the Department from which the California Department of Public Health (CDPH) and the Department of Health Care Services (DHCS) were formed as of July 1, 2007.

CEQA: California Environmental Quality Act. Adopted in 1970 and incorporated in the Public Resources Code §§21000-21177. Its basic purposes are to: inform governmental decision makers and the public about the potential significant environmental effects of proposed activities; identify ways that environmental damage can be avoided or significantly reduced; require changes in projects through the use of alternatives or mitigation measures when feasible; and disclose to the public the reasons why a project was approved if significant environmental effects are involved.

CEUs: Continuing Education Units. The amount of credit given for participating in a continuing education course or training session.

CHCF: The California HealthCare Foundation (www.chcf.org)

CHDP: Child Health and Disability Prevention Program. A preventive health program serving California's children and youth. CHDP makes early health care available to children with evident health problems as well as to those who seem well. (www.dhs.ca.gov/chdp)

CHIS: California Health Interview Survey. The largest telephone survey in the United States, surveying 55,000 households in each county throughout California, focusing on public health and access to health care. (www.chis.ucla.edu)

CHPS: Collaborative for High Performance Schools. An organization that facilitates the design of high performance schools, promoting energy efficiency, healthy, comfortable, and well lit environments, and other amenities needed for a quality education. (www.chps.net)

Chronic: Remains for several years, possibly a lifetime.

CHW: Community Health Worker

Clean School Bus USA guidelines: Guidelines designed by the Environmental Protection Agency to reduce both children's exposure to diesel exhaust and the amount of air pollution created by diesel school buses. (www.epa.gov/otaq/schoolbus/index.htm).

Clinical practice guidelines: A systematically developed statement to assist practitioner and patient decisions about appropriate health care for one or more specific clinical circumstances.

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.

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.

COPD: Chronic Obstructive Pulmonary Disease

Corporate social responsibility: The integration by companies of social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis — going beyond the fulfillment of legal requirements by investing more in human capital, the environment, and relations with stakeholders.

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.

Cost-of-illness evaluation: Empiric description of the economic consequences of illness on individuals or populations.

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

CSHP: Coordinated School Health Program

CYTS: California Youth Tobacco Survey. On-going telephone survey of randomly selected youth between the ages of 12 and 17. This survey queries youth about their tobacco use behavior and attitudes about tobacco use.

Descriptive epidemiology: The aspect of epidemiology concerned with organizing and summarizing health-related data according to time, place, and person.

DFR: Doctor's First Report of Occupational Injury or Illness. 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.

DHCS: California Department of Health Care Services

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.

Economic impact: Effects of a health condition such as asthma measured through direct medical care costs of health services for prevention and treatment; indirect costs in terms of the value of related morbidity, premature mortality, and productivity loss; and intangible costs associated with the value of the psychosocial impacts of a condition.

ED: Emergency Department/Emergency Room

EMT: Emergency medical technician

Environmental control: Removal of risk factors from the environment.

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.

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.

EPP: Environmentally Preferable Purchasing. The selection and procurement of goods and services that have a reduced impact on human health and the environment (as compared to competing goods and services).

Evidence-based medicine: The use of current best evidence from scientific and medical research to make decisions about the care of individual patients. It involves formulating questions relevant to the care of particular patients, searching the scientific and medical literature, identifying and evaluating relevant research results, and applying the findings to patients.

Etiology: The study of the causes, or origins, of diseases or abnormal physiological conditions.

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."

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.

Guided self-management: Providing the patient and his or her family with suitable information and training so that the patient can keep well and adjust treatment according to a medication plan developed with the health care professional.

H&SC: Health and Safety Code

Health care professional: Individual who is licensed to provide medical care. Among these are physicians, nurses, nurse practitioners, respiratory therapists, and pharmacists.

Healthy Families: Low cost health coverage for children birth through age 18 through the State of California.

Healthy Homes Program (or Initiative): A nationwide 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. (www.hud.gov/offices/lead/hhi)

Healthy People 2010: A set of health objectives for the nation to achieve over the first decade of the new century. It can be used by many different people, states, communities, professional organizations, and others to help them develop programs to improve health. (www.healthypeople.gov)

HEDIS®: Healthcare Effectiveness Data and Information Set. 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. (web.ncqa.org)

HIT: Health information technology

HMO: Health Maintenance Organization. HMOs provide care through a specified network of doctors and hospitals. Members of HMOs select a primary care physician who coordinates all care. A co-payment is typically required for each office visit. Aside from the co-payment, the patient does not pay for services from a physician or hospital. However, the patient is responsible for the cost of services that are not covered benefits or the cost of unauthorized services that the patient elects to receive.

IAQ: Indoor Air Quality. Describes how polluted the air inside a confined space is; this is determined by the amount of air pollutants released and the effectiveness of the ventilation systems to remove them. It is often compared to guidelines set by professional or governmental entities.

IAQ TfS: Indoor Air Quality Tools for Schools. A program developed by the U.S. EPA to reduce exposures to indoor environmental contaminants in schools through the voluntary adoption of sound indoor air quality management practices. (www.epa.gov/iaq/schools)

IIPP: Illness and Injury Prevention Programs for workplaces, required by CCR Title 8 §3203. (www.dir.ca.gov/Title8/3203.html)

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: The practice of using the least hazardous treatments first and progressing to more toxic treatments only as necessary.

Irritant: Risk factor or trigger that may cause increased symptoms and/or airflow limitation via a neural pathway; a nonallergic 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.

License-exempt child care: This includes an array of settings: relative care, cooperative care, care for one family, public recreation programs, extended day care, parents-on-site child care, nanny care, parents in school or adult education child care, instructional child care and activities based child care. These settings are not covered under the regulations referenced.

Low allergen landscaping: Selection of vegetation that release lower amounts of allergenic pollens and landscaping trees and shrubs away from building ventilation systems.

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.

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."

NAAQS: National Ambient Air Quality Standards. Standards that define clean air, and are established by the U.S. EPA to protect even the most sensitive individuals in our communities. An air quality standard defines the maximum concentration of a pollutant, in outdoor air that can be present without harm to the public's health (www.arb.ca.gov/research/aaqs/caaqs/caaqs.htm).

NAEPP: National Asthma Education and Prevention Program. 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. (www.nhlbi.nih.gov/about/naepp/index.htm)

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).

NHLBI: National Heart, Lung, and Blood Institute. Part of the federal National Institutes of Health. (www.nhlbi.nih.gov)

$N0_2$: Nitrogen Dioxide

OHB: Occupational Health Branch of the California Department of Public Health

Ob/Gyn: Obstetrics and Gynecology

Patient education (Asthma): Teaching 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 blow out 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.

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

Primary asthma prevention: Preventing development of asthma.

Population-based interventions: Interventions that are specific to a general population defined by geopolitical boundaries.

PHIA: Public Health Impact Assessment. Commonly defined as "a combination of procedures, methods, and tools by which a policy, program, or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population." (1999 Gothenburg consensus statement, www.euro.who.int/document/PAE/Gothenburgpaper.pdf)

QI: Quality improvement. 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.

RAMP: Regional Asthma Management & Prevention (www.rampasthma.org)

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

1. 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."
2. Risk factors that cause asthma exacerbations in individuals who already have the condition. These are also called triggers.

SARC: School Accountability Report Cards. 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.

Secondary asthma prevention: Preventing exacerbations of asthma in those who already have the condition and avoiding deterioration in lung function or death from the condition.

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.

Social impact: Effects of a health condition on social functioning. In asthma, social impacts include impaired child development and education as well as disruption and loss of adult employment and productivity.

SOPHE: Society for Public Health Education (www.sophe.org)

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.

TCE: The California Endowment (www.calendow.org)

Translation 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.

TRI: Toxics Release Inventory. A publicly available EPA database that contains information on toxic chemical releases and other waste management activities reported annually by certain covered industry groups as well as federal facilities. This inventory was established under the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) and expanded by the Pollution Prevention Act of 1990.

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

UC: University of California (www.universityofcalifornia.edu)

U.S. EPA: Environmental Protection Agency. A federal agency that was established to protect human health and to safeguard the natural environment, air, water and land, upon which life depends. The California equivalent is the California Environmental Protection Agency (Cal/EPA) whose mission is to restore, protect and enhance the environment, to ensure public health, environmental quality and economic vitality. (www.epa.gov)

Wheeze: A breathing sound that may be squeaky, whistling, or musical. Wheezes are often (but not always) a symptom of asthma. (Some people have asthma but never wheeze, and some people wheeze for reasons other than asthma.) Wheezes are due to air passing through a narrowed opening and are therefore usually accompanied by breathing difficulty.

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

Contributing Organizations

Air Resources Board (www.arb.ca.gov)

Alameda County Public Health Department (www.acphd.org)

Allergy and Asthma Medical Group and Research Center (www.allergyandasthma.com)

American Academy of Pediatrics (www.aap.org)

American Lung Association of California (www.californialung.org)

American Lung Association of the East Bay (www.alaebay.org)

Asthma & Allergy Foundation of America (www.aafa.org)

Asthmagenic Landscaping (www.allergyfree-gardening.com)

Bayview Hunters Point Health and Environmental Assessment Task Force (www.sfdph.org)

Berkeley Tobacco Prevention Program (www.ci.berkeley.ca.us/publichealth)

Berkeley-Albany YMCA Head Start (www.baymca.org)

Blue Cross of California (www.bluecrossca.com)

Breathe California (www.breathecalifornia.org)

Breathe California of Sacramento-Emigrant Trails (www.sacbreathe.org)

Breathe California of the Central Coast (www.breathecentral.org)

Breathe California, Golden Gate Public Health Partnership (www.ggbreathe.org)

California Asthma Partners (www.asthmapartners.org)

California Childcare Health Program (www.ucsfchildcarehealth.org)

California Department of Corrections and Rehabilitation (www.cdcr.ca.gov)

California Department of Education — Head Start Collaboration (www.cde.ca.gov)

California Department of Education — School Health Connections Office (www.cde.ca.gov/ls/he/cs)

California Department of Social Services – Community Care Licensing Division (www.ccld.ca.gov)

California Emergency Medical Services Authority (www.emsa.ca.gov)

California Endowment (www.calendow.org)

California Environmental Protection Agency – Office of Environmental Health Hazard Assessment (www.oehha.ca.gov)

California HealthCare Foundation (www.chcf.org)

California Occupational Safety & Health Administration (www.dir.ca.gov/dosh/)

California Pharmacists Association (www.cpha.com)

California Primary Care Association (www.cpca.org)

California School Boards Association (www.csba.org)

California School Health Centers Association (www.schoolhealthcenters.org)

California School Nurses Organization (www.csno.org)

California Smokers' Helpline (www.californiasmokershelpline.org)

California Society of Allergy Asthma and Immunology (www.csaai.org)

California State University, Long Beach, Health Science Department (www.csulb.edu)

California Thoracic Society, American Lung Association of California (www.californialung.org)

Center for Environmental Health (www.cehca.org)

Center for Health Care Strategies, Inc. (www.chcs.org)

Center for Tobacco Policy and Organizing (www.californialung.org/thecenter)

Children's Hospital and Research Center Oakland (www.childrenshospitaloakland.org)

Chula Vista Elementary School District (www.cvesd.org)

City of Berkeley – Division of Public Health (www.ci.berkeley.ca.us/publichealth)

City of Berkeley Tobacco Prevention Program (www.ci.berkeley.ca.us/publichealth)

Collaborative on Health and the Environment (www.healthandenvironment.org)

Comite Civico DeValle

Community Health Works, San Francisco State University – Department of Health Education (www.sfsu.edu)

Contra Costa County Community Service Department (www.co.contra-costa.ca.us/depart/service)

Contra Costa Health Services, Public Health (www.cchealth.org)

Environmental Protection Agency Region IX, School Indoor Air Quality (www.epa.gov/region09)

First 5 California (www.ccfc.ca.gov)

GlaxoSmithKline (www.gsk.com)

Green Schools Initiative (www.greenschools.net)

Health Education Council (www.healthedcouncil.org)

Health Plan of San Joaquin (www.hpsj.com)

Healthy African American Families Environmental Collaborative (www.haaf2.org)

Healthy San Leandro Collaboration (www.wafaa4sanleandro.us)

Hemet Valley Medical Center (www.valleyhealthsystem.com)

Kaiser Permanente (www.kaiserpermanente.org)

L.A. Care Health Plan (www.lacare.org)

La Clinica de La Raza (www.laclinica.org)

Legal Services of Northern California (www.lsnc.info)

Long Beach Alliance for Children with Asthma (www.lbaca.org)

Los Angeles County (www.lacounty.info)

Los Angeles Unified School District (www.lausd.net)

Marin County Department of Health & Human Services (www.co.marin.ca.us)

Merced/Mariposa County Asthma Coalition (www.mmcac.com)

Mission Hospital (www.mission4health.com)

MotherNet, Los Angeles (www.inmed.org/programs/mothernet_la.htm)

National Latino Research Center (www.csusm.edu/nlrc)

Northern Sierra Air Quality Management District (www.myairdistrict.com)

Oakland Berkeley Asthma Coalition, Ethnic Health Institute (www.altabatessummit.org/ehi/ehiasthma.html)

Operation Samahan (www.operationsamahan.org)

Pacific Institute (www.pacinst.org)

Parent Voices San Francisco (www.parentvoices.org)

Policy Link (www.policylink.org)

Prevention Institute (www.preventioninstitute.org)

Raimi & Associates, Inc. (www.raimiassociates.com)

RAND Health (www.rand.org/health)

Regional Asthma Management & Prevention (RAMP) Initiative (www.rampasthma.org)

Sacramento County Department of Health and Human Services (www.sacdhhs.com)

Saint Agnes Medical Center (www.samc.com)

San Diego Black Health Associates (www.sdbha.org)

San Diego Family Care (www.lvhcc.com)

San Francisco Department of Public Health (www.sfdph.org)

San Francisco Environment – City and County of San Francisco (CCSF) (www.sfenvironment.com)

San Mateo County Health Department (www.smhealth.org)

School Health Connections (www.dhs.ca.gov/ps/cdic/shc)

Solano Asthma Coalition (www.co.solano.ca.us)

Solano County Health and Social Services Department (www.co.solano.ca.us)

Sonoma County Asthma Coalition (www.sonomaasthma.org)

South Coast Air Quality Management District (www.aqmd.gov)

St. Luke's Hospital (www.stlukes-sf.org)

Stanislaus County Health Services Agency (www.schsa.org)

Technical Assistance Legal Center (www.talc.phi.org)

The Center for Tobacco Policy & Organizing, American Lung Association of California (www.californialung.org/thecenter)

Tulare County Asthma Coalition/Tulare District Health Care System (www.tdhs.org/asthma_coalition.html)

United States Environmental Protection Agency (www.epa.gov)

University of California, Berkeley (www.berkeley.edu)

University of California, Berkeley, School of Public Health (sph.berkeley.edu)

University of California, Davis Medical Center (www.ucdmc.ucdavis.edu/)

University of California, San Francisco (www.ucsf.edu)

University of California, San Francisco – Fresno (www.fresno.ucsf.edu)

University of California, San Francisco, Department of Community Health Systems (www.ucsf.edu/chs)

West Fresno Health Care Coalition, Inc.

West Oakland Asthma Coalition/Prescott Joseph Center (www.prescottjoseph.org/health.html)