


**EXECUTIVE OFFICE OF THE PRESIDENT  
OFFICE OF MANAGEMENT AND BUDGET  
Route Slip**

To: Devorah Adler	/	Take necessary action	[ ]
	/	Approval or signature	[ ]
	/	Comment	[ ]
	/	Prepare reply	[ ]
	/	Discuss with me	[ ]
	/	For your information	[x]
	/	See remarks below	[x]

From: Claudia Magdalena  Abendroth

Date: January 5, 1999

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**SUBJECT: EPA's Children's Asthma Initiative - FY 2000 request**

As you requested, attached please find information on EPA's FY 2000 budget request for children's asthma. The first table presents the funding request and OMB Final levels among research, education and outreach, and air monitoring components. The second table is EPA's table for its FY 2000 request, detailed by program activity and by FY 99 enacted level, FY 2000 guidance, and FY 2000 above guidance request. I understand that you have received the Asthma in America: Our Children at Risk Draft Workplan, drafted by the Task Force on Environmental Health Risks and Safety Risk to Children, dated November 19, 1998; therefore, I have not included it as an attachment.

***EPA's Children's Asthma Initiative***

	1999 Pres Bud	2000 Request	2000 OMB Final	OMB Final from 1999 Enacted
<b>EPA Total</b>	<b>5</b>	<b>29</b>	<b>23</b>	<b>+18</b>
research	3	11	5	+2
education and outreach	2	14	14	+12
air monitoring	-	4	4	+4

05. january 1999

DOUG SOH

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EPA Asthma Initiative President's Task Force on Environmental Health Risks and Safety Risks to Children					
FY99 Presidents Budget		FY2000 OMB Submission \$6,800 K "Level 1"		"Over target" Request to OMB \$17,000 K "Level 2"	
Activity/Output	\$\$	Activity/Output	\$\$	Activity/Output	\$\$
<b>ORD (Goal 8)</b>	<b>3.3 \$4M</b>		<b>2.1 \$1.3M</b>		<b>\$6 M</b>
Centers for Children's Environmental Health and Prevention Research Program	3.3	Role of Environmental Pollutants in the Induction of Asthma - A multi- disciplinary approach incorporating human exposure, toxicologic, clinical and epidemiologic studies would be employed to evaluate the role of exposure to ambient air pollutants, indoor air contaminants, pesticides, and other volatile organic compounds in the induction of asthma.	\$ .9 M	Role of Environmental Pollutants in the Exacerbation of Asthma - A multi- disciplinary approach incorporating human exposure, toxicologic, clinical and epidemiologic studies would be employed to evaluate the role of exposure to ambient air pollutants and indoor air contaminants on the frequency and severity of asthma attacks in children.	\$1.5 M
				Role of Environmental Pollutants in Allergic Sensitization - A multi- disciplinary approach incorporating human exposure, toxicologic, clinical and epidemiologic studies would be employed to evaluate the role of exposure to ambient air pollutants indoor air contaminants, and pesticides in the development of allergic sensitization and asthma in children.	\$ 1.5 M
				Multimedia pollutants and childhood experience of asthma - A longitudinal study (prenatal through adolescence) of the role of exposure to ambient air pollutant, indoor air contaminants, and pesticides on allergic sensitization, incidence of asthma, asthma severity, and the timing of asthma attacks in one or more well-characterized birth cohorts of children at high risk for the development of asthma.	\$ 3 M
		Buy Clean (joint w/ OPPTS)	\$ .4 M		

**EPA Asthma Initiative**  
**President's Task Force on Environmental Health Risks and Safety Risks to Children**

FY99 Presidents Budget		FY2000 OMB Submission \$6,800.K "Level 1"		"Over target" Request to OMB +\$17,000.K "Level 2"	
Activity/Output	\$\$	Activity/Output	\$\$	Activity/Output	\$\$
<b>Indoor Air (IED/OAR)</b>		<b>\$1.5 M</b>		<b>\$5.0 M</b>	
<u>Open Airways</u> Support to American Lung Association to implement asthma management program in elementary schools.	\$ .1 M	<u>Open Airways</u> Expand implementation of the ALA Open Airways asthma management program to 1250 elementary schools.	\$ 1.5M	<u>Open Airways</u> program in 1700 additional elementary schools  <u>A is for Asthma</u> program for pre-school children to 89 ALA affiliates.	\$2 M  \$.5 M
		<u>Managed Care/Health Care</u> Economic analysis to develop incentives for managed care	\$.2M	<u>Managed Care/Health Care</u>  --Cabinet level summit with managed care CEOs --State-wide urban environmental asthma summits in 5 states --National Environmental Asthma Caucus for practitioners, researchers, industry and government	\$1 M
<u>National Asthma Media Campaign</u> National asthma prevention campaign targeted to urban residents	\$.6 M	<u>Expand National Asthma Media Campaign</u> National asthma prevention campaign targeted to urban residents	\$.5 M	<u>Expand National Asthma Media Campaign</u> One additional wave of multimedia national asthma prevention campaign.	\$4 M
<u>IAQ Tools for Schools</u>	\$.3	<u>IAQ Tools for Schools</u> Expand implementation of Tools for Schools program to 1250 schools	\$1.5M	<u>IAQ Tools for Schools</u> --Develop and implement partnership/recognition program for schools. --Expand implementation of Tools for Schools program to 3250 schools	\$2.5 M
<u>ETS Media Campaign</u> One wave of ETS media campaign to get "smoke outside" message to smoking parents.	\$.5 M	<u>ETS Media Campaign</u> Two additional waves of national ETS media campaign to get multiple messages to smoking parents.	\$.8 M	<u>ETS Fund local communities</u> through established tobacco control programs to work through doctors, health clinics, civic groups to discourage children's exposure to ETS.	\$ 1.1 M
		<u>G8 ETS Implementation Strategy</u>	\$.5 M		

EPA Asthma Initiative					
President's Task Force on Environmental Health Risks and Safety Risks to Children					
FY99 Presidents Budget		FY2000 OMB Submission \$6,800 K "Level 1"		"Over target" Request to OMB + \$17,000 K "Level 2"	
Activity/Output	\$\$	Activity/Output	\$\$	Activity/Output	\$\$
<b>Ambient Air Pollution (OAQPS/OAR)</b>					<b>\$1.5 M</b>
				Expand ambient monitoring network for ozone and particulates to areas downwind of 3-5 urban areas to increase exposure information that can be correlated with asthma surveillance data. <sup>2</sup>	
<b>OPPTS</b>			<b>\$1.5 M</b>		
		<u>Buy Clean</u>	\$5M		

1 \$1.5 M included for Regional implementation plus \$1.5 M for G 8 Implementation requested by the Office of International Activities.

2 Traditional ozone monitoring network is found within urban areas. With increasing urban sprawl, exposure of populations downwind of high ozone areas is believed to be significant. Enhanced monitoring capability for ozone and PM outside the immediate urban area would add improved understanding of human exposure on a regional scale for ozone and PM problem.

**Bill Summary & Status for the 106th Congress**

ASTHMA

**Item 10 of 17**

**PREVIOUS BILL | NEXT BILL**  
**PREVIOUS BILL:ALL | NEXT BILL:ALL**  
**NEW SEARCH | HOME | HELP**

**S.805**SPONSOR: **Sen Durbin, Richard J.** (introduced 04/15/99)Jump to: [Titles](#), [Status](#), [Committees](#), [Amendments](#), [Cosponsors](#), [Summary](#)**TITLE(S):**

- **SHORT TITLE(S) AS INTRODUCED:**  
Children's Asthma Relief Act of 1999
- **OFFICIAL TITLE AS INTRODUCED:**  
A bill to amend title V of the Social Security Act to provide for the establishment and operation of asthma treatment services for children, and for other purposes.

**STATUS:** Floor Actions

\*\*\*NONE\*\*\*

**STATUS:** Detailed Legislative Status**Senate Actions****Apr 15, 99:**

Read twice and referred to the Committee on Finance.

**STATUS:** Congressional Record Page References

04/15/99 Introductory remarks on Measure (CR S3777)

04/15/99 Full text of Measure as introduced printed (CR [S3777-3779](#))**COMMITTEE(S):**

- **COMMITTEE(S) OF REFERRAL:**  
[Senate Finance](#)

**AMENDMENT(S):**

\*\*\*NONE\*\*\*

**COSPONSORS(3):**[Sen DeWine, Michael](#) - 04/15/99    [Sen Kennedy, Edward M.](#) - 04/15/99[Sen Schumer, Charles E.](#) - 04/15/99

**SUMMARY:**

\*\*\*NONE\*\*\*

S 805 IS

106th CONGRESS

1st Session

**S. 805**

To amend title V of the Social Security Act to provide for the establishment and operation of asthma treatment services for children, and for other purposes.

**IN THE SENATE OF THE UNITED STATES**

**April 15, 1999**

Mr. DURBIN (for himself, Mr. DEWINE, Mr. KENNEDY, and Mr. SCHUMER) introduced the following bill; which was read twice and referred to the Committee on Finance

---

**A BILL**

To amend title V of the Social Security Act to provide for the establishment and operation of asthma treatment services for children, and for other purposes.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,*

**SECTION 1. SHORT TITLE.**

This Act may be cited as the 'Children's Asthma Relief Act of 1999'.

**SEC. 2. FINDINGS.**

(a) FINDINGS- Congress makes the following findings:

- (1) Asthma is one of the Nation's most common and costly diseases. It affects an estimated 14,000,000 to 15,000,000 individuals in the United States, including almost 5,000,000 children.
- (2) Asthma is often a chronic illness that is treatable with ambulatory care, but over 43 percent of its economic impact comes from use of emergency rooms, hospitalization, and death.
- (3) In Illinois, the mortality rate for blacks from asthma is the highest in the nation with 60.8 deaths per every 1,000,000 population. In Ohio, the mortality rate for blacks from asthma is 32.2 per 1,000,000 population and the mortality rate for whites from asthma is 11.7 per 1,000,000.
- (4) In 1995, there were more than 1,800,000 emergency room visits made for asthma-related attacks and among these, the rate for emergency room visits was 48.8 per 10,000 visits among whites and 228.9 per 10,000 visits among blacks.
- (5) Hospitalization rates were highest for individuals 4 years old and younger, and were 10.9 per 10,000 visits for whites and 35.5 per 10,000 visits for blacks.

- (6) From 1979 to 1992, the hospitalization rates among children due to asthma increased 74 percent.
- (7) It is estimated that more than 7 percent of children now have asthma.
- (8) Although asthma can occur at any age, about 80 percent of the children who will develop asthma do so before starting school.
- (9) From 1980 to 1994, the most substantial prevalence rate increase for asthma occurred among children aged 0-4 years (160 percent) and persons aged 5-14 years (74 percent).
- (10) Asthma is the most common chronic illness in childhood, afflicting nearly 5,000,000 children under age 18, and costing an estimated \$1,900,000,000 to treat those children. The death rate for children age 19 and younger increased by 78 percent between 1980 and 1993.
- (11) Children aged 0 to 5 years who are exposed to maternal smoking are 201 times more likely to develop asthma compared with those free from exposure.
- (12) Morbidity and mortality related to childhood asthma are disproportionately high in urban areas.
- (13) Minority children living in urban areas are especially vulnerable to asthma. In 1988, national prevalence rates were 26 percent higher for black children than for white children.
- (14) Certain pests known to create public health problems occur and proliferate at higher rates in urban areas. These pests may spread infectious disease and contribute to the worsening of chronic respiratory illnesses, including asthma.
- (15) Research supported by the National Institutes of Health demonstrated that the combination of cockroach allergen, house dust mites, molds, tobacco smoke, and feathers are important causes of asthma-related illness and hospitalization among children in inner-city areas of the United States.
- (16) Cities outside the United States have developed and implemented effective systems of cockroach management.
- (17) Integrated pest management is a cost-effective approach to pest control that emphasizes prevention and uses a range of techniques, including property maintenance and cleaning, and pesticides as a means of last resort.
- (18) Reducing exposure to cockroach allergen, as part of an integrated approach to asthma management, may be a cost-effective way of reducing the social and economic costs of the disease.
- (19) No current Federal funding exists specifically to assist cities in developing and implementing integrated strategies to reduce cockroach infestation.
- (20) Asthma is the most common cause of school absenteeism due to chronic illness with 10,100,000 days missed from school per year in the United States.
- (21) According to a 1995 National Institute of Health workshop report, missed school days accounted for an estimated cost of lost productivity for parents of children with asthma of almost \$1,000,000,000 per year.
- (22) According to data from the 1988 National Health Interview Survey (NHIS), which surveyed children for their health experiences over a 12-month period, 25 percent of those children reported experiencing a great deal of pain or discomfort due to asthma either often or all the time during the previous 12 months.

(23) Managing asthma requires a long-term, multifaceted approach, including patient education, behavior changes, avoidance of asthma triggers, pharmacologic therapy, and frequent medical follow-up.

(24) Enhancing the available prevention, educational, research, and treatment resources with respect to asthma in the United States will allow our Nation to address more effectively the problems associated with this increasing threat to the health and well-being of our citizens.

### **SEC. 3. CHILDREN'S ASTHMA RELIEF.**

Title V of the Social Security Act (42 U.S.C. 701 et seq.) is amended by adding at the end the following:

#### **SEC. 511. ASTHMA TREATMENT GRANTS PROGRAM.**

(a) **PURPOSES-** The purposes of this section are as follows:

(1) To provide access to quality medical care for children who live in areas that have a high prevalence of asthma and who lack access to medical care.

(2) To provide on-site education to parents, children, health care providers, and medical teams to recognize the signs and symptoms of asthma, and to train them in the use of medications to prevent and treat asthma.

(3) To decrease preventable trips to the emergency room by making medication available to individuals who have not previously had access to treatment or education in the prevention of asthma.

(4) To provide other services, such as smoking cessation programs, home modification, and other direct and support services that ameliorate conditions that exacerbate or induce asthma.

(b) **AUTHORITY TO MAKE GRANTS-**

(1) **IN GENERAL-** In addition to any other payments made under this title, the Secretary shall award grants to eligible entities to carry out the purposes of this section, including grants that are designed to develop and expand projects to--

(A) provide comprehensive asthma services to children, including access to care and treatment for asthma in a community-based setting;

(B) fully equip mobile health care clinics that provide preventive asthma care including diagnosis, physical examinations, pharmacological therapy, skin testing, peak flow meter testing, and other asthma-related health care services;

(C) conduct study validated asthma management education programs for patients with asthma and their families, including patient education regarding asthma management, family education on asthma management, and the distribution of materials, including displays and videos, to reinforce concepts presented by medical teams; and

(D) identify eligible children for the medicaid program under title XIX, the State Children's Health Insurance Program under title XXI, or other children's health programs.

(2) **AWARD OF GRANTS-**

`(A) APPLICATION-

`(i) IN GENERAL- An eligible entity shall submit an application to the Secretary for a grant under this section in such form and manner as the Secretary may require.

`(ii) REQUIRED INFORMATION- An application submitted under this subparagraph shall include a plan for the use of funds awarded under the grant and such other information as the Secretary may require.

`(B) REQUIREMENT- In awarding grants under this section, the Secretary shall give preference to eligible entities that demonstrate that the activities to be carried out under this section shall be in localities within areas of known

high prevalence of childhood asthma or high asthma-related mortality (relative to the average asthma incidence rates and associated mortality rates in the United States). Acceptable data sets to demonstrate a high prevalence of childhood asthma or high asthma-related mortality may include data from Federal, State, or local vital statistics, title XIX or XXI claims data, other public health statistics or surveys, or other data that the Secretary, in consultation with the Director of the Centers for Disease Control and Prevention, deems appropriate.

`(3) DEFINITION OF ELIGIBLE ENTITY- In this section, the term `eligible entity' means a State agency or other entity receiving funds under this title, a local community, a nonprofit children's hospital or foundation, or a nonprofit community-based organization.

`(c) COORDINATION WITH OTHER CHILDREN'S PROGRAMS- An eligible entity shall identify in the plan submitted as part of an application for a grant under this section how the entity will coordinate operations and activities under the grant with--

`(1) other programs operated in the State that serve children with asthma, including any such programs operated under this title, title XIX, and title XXI; and

`(2) one or more of the following--

`(A) the child welfare and foster care and adoption assistance programs under parts B and E of title IV;

`(B) the head start program established under the Head Start Act (42 U.S.C. 9831 et seq.);

`(C) the program of assistance under the special supplemental nutrition program for women, infants and children (WIC) under section 17 of the Child Nutrition Act of 1966 (42 U.S.C. 1786);

`(D) local public and private elementary or secondary schools; or

`(E) public housing agencies, as defined in section 3 of the United States Housing Act of 1937 (42 U.S.C. 1437a).

`(d) EVALUATION- An eligible entity that receives a grant under this section shall submit to the Secretary an evaluation of the operations and activities carried out under the grant that includes--

`(1) a description of the health status outcomes of children assisted under the grant;

`(2) an assessment of the utilization of asthma-related health care services as a result of activities carried out under the grant;

`(3) the collection, analysis, and reporting of asthma data according to guidelines prescribed by the Director of the Centers for Disease Control and Prevention; and

`(4) such other information as the Secretary may require.

`(e) APPLICATION OF OTHER PROVISIONS OF TITLE-

`(1) IN GENERAL- Except as provided in paragraph (2), the other provisions of this title shall not apply to a grant made under this section.

`(2) EXCEPTIONS- The following provisions of this title shall apply to a grant made under this section to the same extent and in the same manner as such provisions apply to allotments made under section 502(c):

`(A) Section 504(b)(4) (relating to expenditures of funds as a condition of receipt of Federal funds).

`(B) Section 504(b)(6) (relating to prohibition on payments to excluded individuals and entities).

`(C) Section 506 (relating to reports and audits, but only to the extent determined by the Secretary to be appropriate for grants made under this section).

`(D) Section 508 (relating to nondiscrimination).

`(f) AUTHORIZATION OF APPROPRIATIONS- There are authorized to be appropriated to carry out this section \$50,000,000 for each of the fiscal years 2000 through 2004.'

#### **SEC. 4. INCORPORATION OF ASTHMA PREVENTION TREATMENT AND SERVICES INTO STATE CHILDREN'S HEALTH INSURANCE PROGRAMS.**

(a) IN GENERAL- The Secretary of Health and Human Services shall, in accordance with subsection (b), carry out a program to encourage States to implement plans to carry out activities to assist children with respect to asthma in accordance with guidelines of the National Asthma Education and Prevention Program (NAEPP) and the National Heart, Lung and Blood Institute.

(b) RELATION TO CHILDREN'S HEALTH INSURANCE PROGRAM-

(1) IN GENERAL- Subject to paragraph (2), if a State child health plan under title XXI of the Social Security Act (42 U.S.C. 1397aa et seq.) provides for activities described in subsection (a) to an extent satisfactory to the Secretary, the Secretary shall, with amounts appropriated under subsection (c), make a grant to the State involved to assist the State in carrying out such activities.

(2) CRITERIA REGARDING ELIGIBILITY FOR GRANT- The Secretary shall publish in the Federal Register criteria describing the circumstances in which the Secretary will consider a State plan to be satisfactory for purposes of paragraph (1).

(3) REQUIREMENT OF MATCHING FUNDS-

(A) IN GENERAL- With respect to the costs of the activities to be carried out by a State pursuant to paragraph (1), the Secretary may make a grant under such paragraph only if the State agrees to make available (directly or through donations from public or private entities) non-Federal contributions toward such costs in an amount that is not less than 15 percent of the costs.

(B) DETERMINATION OF AMOUNT CONTRIBUTED- Non-Federal contributions

required in subparagraph (A) may be in cash or in kind, fairly evaluated, including equipment or services. Amounts provided by the Federal Government, or services assisted or subsidized to any significant extent by the Federal Government, may not be included in determining the amount of such non-Federal contributions.

(4) TECHNICAL ASSISTANCE- With respect to State child health plans under title XXI of the Social Security Act (42 U.S.C. 1397aa et seq.), the Secretary, acting through the Director of the Centers for Disease Control and Prevention, in consultation with the heads of other Federal agencies involved in asthma treatment and prevention, shall make available to the States technical assistance in developing the provision of such plans that will provide for activities pursuant to paragraph (1).

(c) FUNDING- For the purpose of carrying out this section, there is authorized to be appropriated \$5,000,000 for each of the fiscal years 2000 through 2004.

## **SEC. 5. PREVENTIVE HEALTH AND HEALTH SERVICES BLOCK GRANT; SYSTEMS FOR REDUCING ASTHMA AND ASTHMA-RELATED ILLNESSES THROUGH URBAN COCKROACH MANAGEMENT.**

Section 1904(a)(1) of the Public Health Service Act (42 U.S.C. 300w-3(a)(1)) is amended--

- (1) by redesignating subparagraphs (E) and (F) as subparagraphs (F) and (G), respectively;
- (2) by adding a period at the end of subparagraph (G) (as so redesignated);
- (3) by inserting after subparagraph (D), the following:

`(E) The establishment, operation, and coordination of effective and cost-efficient systems to reduce the prevalence of asthma and asthma-related illnesses among urban populations, especially children, by reducing the level of exposure to cockroach allergen through the use of integrated pest management, as applied to cockroaches. Amounts expended for such systems may include the costs of structural rehabilitation of housing, public schools, and other public facilities to reduce cockroach infestation, the costs of building maintenance, and the costs of programs to promote community participation in the carrying out at such sites integrated pest management, as applied to cockroaches. For purposes of this subparagraph, the term 'integrated pest management' means an approach to the management of pests in public facilities that minimizes or avoids the use of pesticide chemicals through a combination of

appropriate practices regarding the maintenance, cleaning, and monitoring of such sites.';

- (4) in subparagraph (F) (as so redesignated), by striking 'subparagraphs (A) through (D)' and inserting 'subparagraphs (A) through (E)'; and
- (5) in subparagraph (G) (as so redesignated), by striking 'subparagraphs (A) through (E)' and inserting 'subparagraphs (A) through (F)'.

## **SEC. 6. COORDINATION OF FEDERAL ACTIVITIES TO ADDRESS ASTHMA-RELATED HEALTH CARE NEEDS.**

(a) IN GENERAL- The Director of the National Heart, Lung, and Blood Institute shall, through the National Asthma Education Prevention Program Coordinating Committee--

- (1) identify all Federal programs that carry out asthma-related activities;
- (2) develop, in consultation with appropriate Federal agencies and professional and voluntary health organizations, a Federal plan for responding to asthma; and

(3) not later than 12 months after the date of enactment of this Act, submit recommendations to Congress on ways to strengthen and improve the coordination of asthma-related activities of the Federal Government.

(b) REPRESENTATION OF THE DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT- A representative of the Department of Housing and Urban Development shall be included on the National Asthma Education Prevention Program Coordinating Committee for the purpose of performing the tasks described in subsection (a).

(c) AUTHORIZATION OF APPROPRIATIONS- Out of any funds otherwise appropriated for the National Institutes of Health, \$5,000,000 shall be made available to the National Asthma Education Prevention Program for the period of fiscal years 2000 through 2004 for the purpose of carrying out this section. Funds made available under this subsection shall be in addition to any other funds appropriated to the National Asthma Education Prevention Program for any fiscal year during such period.

## **SEC. 7. COMPILATION OF DATA BY THE CENTERS FOR DISEASE CONTROL AND PREVENTION.**

(a) IN GENERAL- The Director of the Centers for Disease Control and Prevention, in consultation with the National Asthma Education Prevention Program Coordinating Committee, shall--

(1) conduct local asthma surveillance activities to collect data on the prevalence and severity of asthma and the quality of asthma management, including--

(A) telephone surveys to collect sample household data on the local burden of asthma; and

(B) health care facility specific surveillance to collect asthma data on the prevalence and severity of asthma, and on the quality of asthma care; and

(2) compile and annually publish data on--

(A) the prevalence of children suffering from asthma in each State; and

(B) the childhood mortality rate associated with asthma nationally and in each State.

(b) COLLABORATIVE EFFORTS- The activities described in subsection (a)(1) may be conducted in collaboration with eligible entities awarded a grant under section 511 of the Social Security Act (as added by section 3).

*END*

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DRAFT  
10/22/98

# Asthma in America: Our Children at Risk

## A Plan for Environmental Action to Protect Children from Asthma

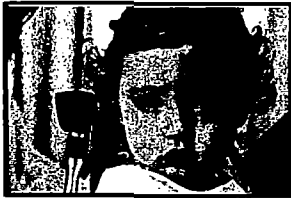


President's Task Force on Environmental Health  
Risks and Safety Risks to Children

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# ABOUT THE PRESIDENT'S TASK FORCE ON ENVIRONMENTAL HEALTH RISKS AND SAFETY RISKS TO CHILDREN

In recognition of the growing body of scientific information demonstrating that America's children suffer disproportionately from environmental health risks and safety risks, President Clinton issued Executive Order 13045 on April 21, 1997, directing each Federal Agency to make it a high priority to identify, assess, and address those risks. In issuing this order, the President also created the Task Force on Environmental Health Risks and Safety Risks to Children, co-chaired by Donna Shalala, Secretary of the Department of Health and Human Services, and Carol M. Browner, Administrator of the Environmental Protection Agency. The



Task Force was charged with recommending strategies for protecting children's environmental health and safety. Two subcommittees were established in the Executive Order to carry out this directive: a subcommittee directed to review and foster public access to federal government sponsored research on environmental health and safety risks to children, and a subcommittee directed to identify priority public outreach activities related to protecting children's environmental health and safety.

In April 1998, the Task Force identified four priority areas for immediate attention: childhood asthma, unintentional injuries, developmental disorders, and childhood cancer. The Task Force created and charged the Asthma Priority Area Workgroup with reviewing current Federal efforts to address the many facets of the issue and, most importantly, to make appropriate recommendations for action by the Federal government. This report is the result of that effort.

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# MEMBERS OF THE PRESIDENT'S TASK FORCE ON ENVIRONMENTAL HEALTH RISKS AND SAFETY RISKS TO CHILDREN

Honorable Donna E. Shalala  
Co-chair  
Secretary  
Department of Health and Human Services

Honorable Carol M. Browner  
Co-chair  
Administrator  
Environmental Protection Agency

Honorable Alexis Herman  
Secretary  
Department of Labor

Honorable Janet Reno  
Attorney General  
Department of Justice

Honorable Andrew Cuomo  
Secretary  
Department of Housing and Urban  
Development

Honorable Elizabeth A. Moler  
Acting Secretary  
Department of Energy

Honorable Richard Riley  
Secretary  
Department of Education

Honorable Dan Glickman  
Secretary  
Department of Agriculture

Honorable Rodney Slater  
Secretary  
Department of Transportation

Honorable Jacob J. Lew, Director  
Office of Management and Budget

Honorable Kathleen McGinty, Chair  
Council on Environmental Quality

Honorable Ann Brown  
Chairman  
Consumer Product Safety Commission

Honorable Janet Yellen  
Chair  
Council of Economic Advisors

Honorable Neal Lane Director  
Office of Science and Technology Policy

Honorable Gene Sperling  
Assistant to the President for Economic Policy

Honorable Bruce Reed  
Assistant to the President for Domestic Policy

# ASTHMA PRIORITY AREA WORKGROUP MEMBERS

Stephen Redd, MD (Co-chair)  
National Center for Environmental Health  
Centers for Disease Control and Prevention

Robert Axelrad (Co-chair)  
Office of Children's Health Protection  
Environmental Protection Agency

Adele C. Morris  
Senior Economist  
Council of Economic Advisers

Mary White, Sc.D  
Division of Health Studies  
Agency for Toxic Substances and Disease Registry

John Talbott  
Office of Building Technologies  
Department of Energy

Ron Ashford  
Department of Housing and Urban Development

Warren Friedman, Ph.D, CIH  
Office of Lead Hazard Control  
Department of Housing and Urban Development

Tracey Mitchell  
Indoor Environments Division  
Environmental Protection Agency

Marshall Plaut, M.D.  
National Institute of Allergy and Infectious Diseases  
National Institutes of Health

Jerry Phelps  
National Institute of Environmental Health Sciences  
National Institutes of Health

Virginia Taggart, M.P.H.  
National Heart, Lung, and Blood Institute  
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## EXECUTIVE SUMMARY

An epidemic of asthma is occurring in the United States. While the epidemic affects people of all ages, children are particularly affected. Nearly 1 in 13 school-aged children has asthma, and the percentage of children with asthma (i.e., prevalence rate) is rising more rapidly in preschool-aged children than in any other age group.

There is no national system to collect data from states specifically on asthma, although several states are developing systems to collect such data. Although national data do not provide the resolution necessary to identify particular geographic areas hardest hit by the asthma epidemic, surveys undertaken in a number of large cities in the United States indicate that the prevalence and severity of asthma are greatest in the large, urban inner cities.

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Asthma is one of the leading causes of school absenteeism, accounting for over 10 million missed school days per year. Asthma also accounts for many nights of interrupted sleep, limitation of activity, and disruptions of family and care-giver routines. Asthma symptoms that are not severe enough to require a visit to an emergency room or to a physician can still be severe enough to prevent a child with asthma from living a fully active life.

In 1990, the cost of asthma to the U.S. economy was estimated to be \$6.2 billion, with the majority of the expense attributed to direct medical expenses. A 1996 analysis found the cost of asthma to be \$14 billion, indicating a rapidly increasing financial burden. These estimates, which are not limited to the costs of childhood asthma, indicate that the direct medical costs of asthma account for between 1% and 3% of all health care expenditures in the United States.

Asthma is a particularly important disease to consider in the context of environmental hazards to which children are exposed. Children breathe more air, eat more food, and drink more liquid in proportion to their body weight than do adults, and their developing respiratory, immunological, and digestive systems may be more susceptible to environmental exposures than those of adults. In a typical day, children may be exposed to a wide array of environmental agents at home, in day care centers, schools and while playing outdoors. There is substantial evidence that environmental exposures, including viruses and allergens, play a major role in triggering asthma symptoms. Airborne allergens include those from house dust mites, cockroaches, mold and animal dander. In addition, exposure to environmental tobacco smoke has been shown to be a major determinant of asthma symptoms. Elevated levels of outdoor air pollutants, particularly ozone, are associated with increased symptoms and an increased risk of emergency department visits for asthma, as well.

In addition, environmental factors such as airborne allergens and environmental tobacco smoke (i.e., secondhand smoke) may play a major role in the onset of asthma. Other pollutants may also play a role, although the scientific data are inadequate to offer firm conclusions. Genetic

predisposition is the strongest known risk factor for developing asthma, but the rapidly rising number of cases of childhood asthma cannot be solely genetic because the genetic composition of the population changes slowly. Rather, some interaction between genetic predisposition and environmental exposures, and possibly other factors such as diet or lack of exercise are likely to be responsible for the increase. Further work is essential to clarify how genetic susceptibility and environmental exposures interact to cause asthma.

Reducing exposures of children with asthma to airborne allergens and pollutants will reduce the health burden of asthma and significantly improve their quality of life. It is not yet certain, but it is possible that reducing the exposure of infants and young children at risk of developing asthma may prevent its onset. Environmental control methods and asthma treatments are available now that can help children and their families control asthma and lead healthy, active lives. Yet not all children have access to these measures. Too many children miss school, limit their physical activity, and are seriously ill because of asthma.

The environmental action plan for asthma outlined in this report is designed to promote concerted Federal action to protect all children with asthma from environmental risks that worsen their disease and to expand federal research to reveal how reducing environmental risks might prevent children from getting asthma.



## GUIDING PRINCIPLES

Federal agency actions can provide leadership and direction in reducing environmental risks to protect children from asthma. Recommendations for action put forward in this initiative are predicated on the principles that federal action must have:

- A focus on efforts to *eliminate the disproportionate impact of asthma in minority populations and those living in poverty.*
- An emphasis on *partnerships and community based programs.*
- A commitment to setting *measurable and consistent goals for childhood asthma under the Healthy People 2010 program.*
- *An investment in evaluation to identify those strategies that are most effective in reducing the burden of asthma so that they may be replicated.*

## RECOMMENDATIONS FOR ACTION

### RESEARCH

Strengthen and accelerate focused research into the environmental factors that cause or worsen childhood asthma.

- ☞ Strengthen and accelerate research into the environmental factors that may contribute to the onset of asthma in children.
- ☞ Expand and accelerate research to develop and evaluate environmental strategies that will improve the quality of life of people with asthma.

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This year 2000 initiative is about protecting children from asthma...

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### PUBLIC HEALTH PROGRAMS

Implement public health programs that foster improved use of current scientific knowledge to reduce environmental exposures to prevent and reduce the severity of symptoms for those with asthma.

- ☞ Promote clinician and patient implementation of national guidelines for reducing environmental risks that worsen asthma.
- ☞ Expand support for state and local public health action.
- ☞ Reduce children's exposure to environmental tobacco smoke and other indoor triggers in their homes.
- ☞ Establish school based asthma programs in every community that help reduce or eliminate allergens and irritants and that promote student's self management of asthma and full participation in school activities.
- ☞ Continue to reduce outdoor air pollution.

### SURVEILLANCE

Establish a coordinated, integrated, and systematic nationwide asthma surveillance system for collecting and analyzing health outcome and risk factor data at the state, regional and local levels.

### DISPROPORTIONATE IMPACT ON THE POOR AND MINORITIES

Eliminate the disproportionate burden of asthma among different racial and ethnic groups and those living in poverty.

- ☞ Conduct research and surveillance activities to improve understanding of the problem.
- ☞ Implement activities to eliminate the disproportionate impact of asthma in minority populations and those living in poverty.



# INTRODUCTION

## The Growing Problem of Asthma in Children

Asthma is a chronic lung disease characterized by recurrent episodes of breathlessness, wheezing, coughing, and chest tightness; these episodes are also known as exacerbations or attacks. The severity of exacerbations can range from mild to life threatening. Both the frequency and severity of asthma symptoms can be reduced by the use of medications and by reducing exposure to the environmental triggers of asthma attacks.

For the past 15 years, an epidemic of asthma has occurred in the United States. By all indications, this epidemic is continuing. Although asthma has become a major public health problem affecting Americans of all ages, races and ethnic groups, children have been particularly severely affected.



National survey data -- the responses of randomly selected U.S. residents being asked whether they had symptoms of physician diagnosed asthma in the previous 12 months -- indicate that the number of children with asthma in the United States has more than doubled in the past 15 years. In 1980, 2.3 million American children had asthma. In 1995, the most recent year for which data are available, the number of affected children had risen to 5.5 million. Based on these trends, it is estimated that in 1998 more than 6 million children in the United States have asthma. Prevalence rates of asthma are highest in boys and are increasing in both boys and girls, and in all race and ethnic groups. The prevalence of asthma in children under age 18 is 7.3%. The most rapid increase has occurred in children under 5 years old, with rates increasing over 160% over the past 15 years.

The number of deaths attributed to asthma in children has also increased. In 1977, 84 deaths in children 18 and younger were recorded; the number of deaths has risen to 280 in 1995, a more than 3-fold increase. Although the death rate due to asthma has increased in all racial and ethnic groups, minority populations experience a disproportionately higher death rate from asthma. In 1995, the death rate from asthma in African-American children, 11.5 per million, was over four times the rate in white Americans, 2.6 per million. The higher death rates among African-American children are especially troubling.

The number of hospitalizations and emergency room visits for asthma have increased in all population groups. Asthma accounts for one-third of all pediatric emergency room visits and is the fourth most common cause for physician office visits. The variation in the impact of asthma across racial and ethnic groups is significant. African American children have an annual rate of hospitalization of 74 per 10,000, over 3 times that for whites, 21 per 10,000. In addition, African American children are approximately 4 times more likely than white children to seek care at an emergency room. In short, African-American children have a slightly higher risk of getting asthma, but have a much higher risk of hospitalization or death due to the disease.

At the present time, surveillance for asthma in children is limited to analyses of ongoing surveys and data systems on health events such as mortality, hospitalization, and outpatient visits. Other than for African Americans, such information is extremely limited for most ethnic groups.

There is no national system to collect data from states specifically on asthma, although several states are developing systems to collect such data. Although national data do not provide the resolution necessary to identify particular geographic areas hardest hit by the asthma epidemic, surveys undertaken in a number of large cities in the United States indicate that the prevalence and severity of asthma are greatest in the large, urban inner cities.

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There is no national system to collect data from states specifically on asthma, although several states are developing systems to collect such data.

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These measures, particularly for death, hospitalization, and emergency room visits, give an incomplete picture of the true burden of asthma in the United States. For example, one follow-up study of children with asthma in inner city areas found a nearly 10 times higher likelihood of a child suffering symptoms of asthma on a given day than visiting an emergency room. Asthma is one of the leading causes of school absenteeism, accounting for over 10 million missed school days per year. Asthma also accounts for many nights of interrupted sleep, limitation of activity, and disruptions of family and care-giver routines. Asthma symptoms that are not severe enough to require a visit to an emergency room or to a physician can still be severe enough to prevent a child with asthma from living a fully active life.

Estimating the costs of asthma is an indirect way to measure its health burden. In 1990, the cost of asthma to the U.S. economy was estimated to be \$6.2 billion, with the majority of the expense attributed to direct medical expenses. A 1996 analysis found the cost of asthma to be \$14 billion, indicating a rapidly increasing financial burden. These estimates indicate that the direct medical costs of asthma for all ages account for between 1% and 3% of all health care expenditures in the United States.

## What We Know About Childhood Asthma

Over the past 15 years, there have been major advances in the scientific understanding of asthma. Asthma is now known to be a disease of airway inflammation resulting from a complex interplay between environmental exposures and genetic and other factors. This has implications for the medical treatment and for the environmental management of asthma.

In contrast to the limited understanding of the relationship of environmental exposures to the onset of asthma, the environmental triggers of asthma attacks for children with asthma have become increasingly well characterized. House dust mites, cockroaches, mold and animal dander have been identified as the principal allergens that trigger asthma symptoms. Reducing exposure to these allergens has been shown not only to reduce asthma symptoms and the need for medication, but also to improve lung function. Environmental tobacco smoke (also called secondhand smoke) is an important irritant that can trigger an asthma episode and possibly

potentiate the effects of allergens. Upper respiratory viral infections are also recognized as important triggers for asthma episodes.

Children with asthma have long been recognized as particularly sensitive to outdoor air pollution. Many common air pollutants, such as ozone, sulfur dioxide, and particulate matter are respiratory irritants and can exacerbate asthma. Air pollution also might act synergistically with other environmental factors to worsen asthma. For example, some evidence suggests that exposure to ozone can enhance a person's responsiveness to inhaled allergens. Whether long term exposure to these pollutants can actually contribute to the development of asthma is not known, though scientists do not believe that outdoor air pollution is a major contributor to the current epidemic. To date, little research has examined the role of other air pollutants in the development or exacerbation of asthma, although this is an issue of increasing public concern.

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In addition to improved understanding of appropriate environmental management of asthma, the medical management of asthma has changed significantly. Inhaled anti-inflammatory medications have become the mainstay of medical management to prevent asthma episodes and lessen chronic symptoms of asthma. In addition, improvements in monitoring techniques now permit objective measures of lung function that are easy for patients and physicians to use in assessing asthma severity and monitoring changes in the disease. In a disease like asthma that varies considerably over time and where changes in lung function can occur before symptoms develop, these objective measures are essential tools for making management decisions.

As a result of these advances, the medical and environmental management of asthma is better defined and the knowledge exists to manage asthma better than ever before. One especially important finding is that patient education has been documented to be cost effective. Teaching patients and their families specific management skills improves asthma management, reduces the use of emergency services, and improves quality of life. This is particularly important for asthma management, since the environmental management of asthma requires knowledge of asthma triggers and specific actions that can be undertaken to reduce exposure to these triggers. The treatment goal for almost all individuals with asthma should be for that person to lead a life unrestricted because of asthma.

Reducing exposure to environmental allergens and pollutants will reduce the frequency and severity of attacks for children with asthma, reduce their need for medicine, and improve their lung function. Children are exposed to many environmental agents that could trigger asthma attacks. For example, 25% of children in America live in areas that regularly exceed EPA limits for ozone. Approximately 38% of children are exposed to environmental tobacco smoke in the home on a regular basis and exposure to environmental tobacco smoke is so widespread that approximately 88% of all children have some level of documented exposure. A high proportion of children living in the inner city are exposed to high levels of cockroach antigen.

## Why Has Asthma Reached Epidemic Proportions in Children?

The causes of the increasing rate of asthma over the past 15 years and the particular role that environmental exposures play are not known, but there are some clues. Atopy, the genetically inherited susceptibility to become allergic, is the most important predictor of a child developing asthma. A substantial research effort is underway to identify the genes that are responsible for susceptibility to asthma. Because the genetic make-up of the population changes slowly, genetic susceptibility alone cannot be responsible for the epidemic of asthma that has occurred in the United States over the past 15 years. Further work is essential to clarify how genetic susceptibility and environmental exposures interact to cause asthma. Factors such as the intensity of environmental exposure and the age of the person being exposed are likely to be important.

Exposure to allergens found indoors is a strong risk factor for developing asthma. Children are spending increasing amounts of time indoors, thus increasing their exposure to indoor allergens.

The environmental exposures most strongly suspected of causing asthma to develop include environmental tobacco smoke and allergens such as house dust mites, cockroaches, mold, and animal dander. Exposures that stimulate the immune system may also be significant, such as diet during the prenatal period and early infancy, the pattern of respiratory infections early in life, and even decreasing rates of exercise have all been suggested as risk factors for the development of asthma. In the broadest sense, many environmental exposures are suspected of contributing to the epidemic of asthma in children.

## Scope of the Plan for Environmental Action to Protect Children With Asthma

This action plan is about protecting children from asthma and the consequences of asthma. To accomplish this goal, the environmental aspects of asthma must be considered in the context of other aspects of asthma prevention and management, such as early access to quality medical care and efforts to understand the disproportionate health impact of asthma among minority populations. Childhood asthma is a multi-factorial disease, and efforts to improve its management and to prevent it will require multi-dimensional, multi-disciplinary efforts that must occur simultaneously. This action plan focuses on improving the environment in which children with asthma live, learn, play and work so that they can live productive, active lives and so that future generations of children might be spared the disease altogether.

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# GOALS OF THE CHILDREN'S ENVIRONMENTAL HEALTH ASTHMA ACTION PLAN

BY THE YEAR 2005, THE NUMBER OF HOUSEHOLDS IN WHICH CHILDREN ARE REGULARLY  
EXPOSED TO SECONDHAND SMOKE WILL BE REDUCED TO 15%.<sup>1</sup>

BY THE YEAR 2010, GUIDELINES FOR PREVENTING THE ONSET OF ASTHMA WILL BE DEVELOPED.

BY THE YEAR 2010, THE INCREASING RATE OF ASTHMA PREVALENCE IN CHILDREN WILL BE  
HALTED.

BY THE YEAR 2010, EVERY CHILD IN AMERICA WILL HAVE PROMPT, AFFORDABLE, AND  
CONVENIENT ACCESS TO THE MOST EFFECTIVE ASTHMA MANAGEMENT TECHNIQUES  
AVAILABLE.

BY THE YEAR 2010, ASTHMA HOSPITALIZATION RATES IN CHILDREN WILL HAVE FALLEN TO NO  
MORE THAN 10 HOSPITALIZATIONS PER 10,000 PEOPLE.<sup>2</sup> (HP 2010 DRAFT)

BY THE YEAR 2010, EMERGENCY DEPARTMENT VISITS WILL BE REDUCED TO NO MORE THAN 46  
PER 10,000 PEOPLE.<sup>3</sup> (HP 2010 DRAFT)

BY THE YEAR 2010, NO MORE THAN 10% OF PEOPLE WITH ASTHMA WILL EXPERIENCE ACTIVITY  
LIMITATIONS.<sup>4</sup> (HP 2010 DRAFT)

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1 Baseline: 29% in 1994. Source: Biennial Radon and ETS Survey of the Conference of Radiation Control Program Directors and EPA.

2 Baseline: Hospitalization rate per 10,000 population in 1993-94: 18 for total population; 50 for children 0-4 yrs of age and 18 for children 5-14 yrs. Source: HP2010 Draft

3 Baseline: Emergency room visits 71 per 10,000 population for total population in 1992-94; 121 for children 0-4 yrs of age and 81 for children 5-14 yrs. Source: HP2010 Draft

4 Baseline: Activity limitation for persons with asthma 22 percent for overall population in 1992-94. No children-specific data available. Source: HP2010 Draft

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## VISION FOR THE 21<sup>ST</sup> CENTURY

Every child in America will live,  
learn, work, and play in  
environments that do not cause or  
worsen asthma.

Asthma will no longer inhibit  
children from leading full and active  
lives.

More cost-effective medical and  
environmental asthma prevention  
and management tools will enhance  
the lives of children and their  
families.

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## GUIDING PRINCIPLES

Federal agency actions can provide leadership and direction in reducing environmental risks to protect children from asthma. Recommendations for action put forward in this plan are predicated on the principles that federal action must have:

1. A focus on efforts to better understand and eliminate the disproportionate impact of asthma in minority populations and those living in poverty.

The health burden of asthma is not shared equally throughout the U.S. population. Although the rising prevalence of asthma has affected all populations, poor and minority children are much more likely than white, non-Hispanic children to visit an emergency room, to be hospitalized, or to die from asthma. The reasons for this inequity are not known, although environmental exposures and limited access to quality medical care may all play a role.

The focus on eliminating disparities across racial and ethnic groups has to be considered in all efforts to prevent asthma and its health impact; however, because of the importance of this issue the committee has included a specific recommendation in this action plan to examine, understand, and ultimately eliminate disparities.

2. An emphasis on partnerships and community based programs.

A successful effort to reduce childhood asthma will depend in part on the level of success achieved in enlisting all sectors of society in efforts to implement effective programs to prevent and manage the disease. Federal agencies have already forged effective partnerships with many health and professional organizations, corporations, and foundations to conduct training, educate health care providers and the public, and to implement a wide range of prevention activities at the national, state, and local levels.

Expanded partnerships both within government and between government and the private sector are needed. With increasing knowledge about the primary causes of asthma and triggers of asthma attacks, the challenge for the 21<sup>st</sup> century will be to learn to integrate successfully these findings into more effective environmental, medical and educational programs. Partnerships will be critical to implementing this broad vision of asthma control. In particular, community-based programs should integrate asthma control activities into existing systems such as schools, child care, youth programs, workplaces, primary health, correctional facilities, and job training programs.

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The challenge for the 21<sup>st</sup> century will be to learn to integrate successfully these findings into more effective environmental, medical and educational programs.

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**3. A commitment to setting measurable and consistent goals for childhood asthma under the Healthy People 2010 program.**

Health objectives are now being developed for the year 2010 and represent a significant revision of the goals set for the year 2000. These objectives will set the nation's health agenda for increasing years of healthy life and reducing disparities among the entire American population. Draft objectives currently encompass an expanded set of asthma-related objectives as well as a series of environmental objectives addressing known asthma triggers such as indoor allergens, secondhand smoke and outdoor air pollution.

The goals embodied in the final Healthy People 2010 document will serve as the tools to measure progress towards control of asthma. Although some of the goals are likely to measure aspects of asthma clinical management that will not be directly affected by this action plan, the primary objectives of morbidity reduction and reducing exposures to environmental hazards will be addressed.

**4. Investment in evaluation of programs to identify those strategies that are most effective in reducing the burden of asthma so that they may be replicated.**

Asthma intervention programs and related activities need to be fully evaluated to determine those techniques which are successful and should be replicated. Evaluation should be incorporated in the planning and should include:

- identification of desired health outcomes of the program;
- measurement of effectiveness of the intervention activities and processes used to implement them;
- identification of unforeseen obstacles;
- assessment of the cost-effectiveness of the program;
- a prediction of long term sustainability of the program.

# RECOMMENDATIONS FOR ACTION

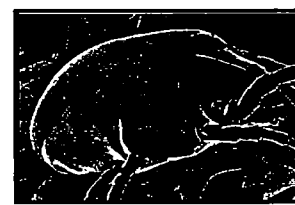
## I. RESEARCH

Strengthen and accelerate focused research into the environmental factors that cause or worsen childhood asthma.

### A. EXPAND RESEARCH INTO THE ENVIRONMENTAL FACTORS THAT CONTRIBUTE TO THE ONSET OF ASTHMA IN CHILDREN.

Though progress has been made in understanding what causes asthma, there is currently insufficient scientific information to establish specific guidelines and recommendations for public health practices to prevent the onset of asthma in children (i.e. primary prevention).

In order to establish primary prevention guidelines, the top priority for research is to determine the causes of asthma in children and particularly the role of the environment. To understand what causes asthma, research must identify the basic cellular and molecular mechanisms that cause airway inflammation and sensitization and, in particular, the interaction of environmental exposures and genetic susceptibility. In addition, clinical and epidemiologic studies are needed to examine the relationship between environmental exposures and the onset of asthma.



Because of promising preliminary work on the relationship of indoor allergens and asthma onset, as well as the much greater proportion of time that children spend indoors, greater emphasis on examining the relationship of indoor exposures to the development of asthma is warranted. Exposures to high levels of allergens in the indoor environment have been shown in some studies to be associated with the subsequent development of asthma. However, few studies have examined the influence of geographic location on the role of allergens. In studies evaluating the role of indoor allergens on exacerbations of asthma, different allergens, such as those associated with cockroaches, dust mites, and mold, have been implicated in different locations. This suggests that different allergens can exacerbate asthma, and that different allergens may be capable of inducing the new onset of asthma.

In one study, avoiding exposure to dust mite and food allergens early in life was found to reduce the risk of developing asthma in the first year of life. However, this effect was not statistically significant at 2 to 4 years of age. Whether such allergen avoidance strategies are feasible and effective in reducing the development of asthma is not known.

The complex interactions between outdoor air pollutants and allergens and the development of asthma have not been adequately evaluated. Some epidemiologic studies have suggested a relationship between exposure to volatile organic compounds and prevalence rates of childhood asthma. Because adult-onset asthma is known to be associated with occupational exposures to volatile organic compounds including formaldehyde, ethylene oxide, and isocyanates, further work to assess the possible etiologic role of specific pollutants in childhood asthma is appropriate.

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Exposures to high levels of allergens in the indoor environment have been shown in some studies to be associated with the subsequent development of asthma.

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#### KEY ACTIONS:

NIH, CDC, and EPA will conduct and fund studies to determine the causes of asthma. Such studies should include the following:

- ▶ examine the role of genetic susceptibility to specific environmental exposures in the development of asthma;
- ▶ assess the importance of early life events, such as *in utero* viral infections, viral infections during infancy, specific antigen exposures and exposures to maternal smoking on the development of asthma;
- ▶ examine the effects of pollutants and allergens on immune responses in animal models and in preclinical studies;
- ▶ Identify the clinical characteristics of asthma associated with different genetic, physiologic, immunologic and environmental factors;
- ▶ examine the effectiveness of combinations of immune modulation to reduce IgE responses to allergen and allergen avoidance as a means to reduce the risk of developing asthma;
- ▶ examine the epidemiology of asthma in different populations to identify risk factors for the onset of asthma.

ATSDR, in partnership with state and local health departments and community groups, will investigate childhood asthma in 5-7 communities where sources of emissions from hazardous waste facilities have already been identified. These investigations will characterize any associations between hazardous materials and the burden of asthma in children.

In addition to intramural and extramural grant programs, NIH, CDC, and EPA will fund medical centers to conduct comprehensive research on environmental aspects of asthma.

The National Academy of Sciences, with support of EPA, will complete its assessment of asthma associated with indoor pollutants. These findings will be used to guide research efforts on the causes of asthma.

**B. EXPAND AND ACCELERATE RESEARCH TO DEVELOP AND EVALUATE ENVIRONMENTAL STRATEGIES THAT WILL IMPROVE THE QUALITY OF LIFE FOR CHILDREN WITH ASTHMA.**

It is well established that inhaled allergens and irritants and outdoor pollutants provoke asthma symptoms. Research is needed to identify if other environmental exposures are significant. Further, the relative importance of various exposures is not well understood. Cost effective strategies for reducing exposures are not well developed.

Patient education strategies in certain populations have profound impacts on reducing the frequency and severity of exacerbations and improving the quality of life for children. But many of these programs are not responsive to the cultural, ethnic, and economic diversity of the American population. Innovative strategies are urgently needed for reaching a wide range of children and their families, for tailoring recommendations for reducing environmental exposures to their needs, and for providing support to follow the recommendations.

**KEY ACTIONS:**

NIH and EPA will conduct studies to examine the interrelationship between indoor allergen exposures, viral infections, ambient air pollutants, and exacerbations of asthma. This research will include identifying and evaluating cost effective methods to reduce allergen exposures, as well as methods to render the immune system less susceptible to environmental exposures.

NIH, CDC and EPA will conduct studies to improve and evaluate interventions designed to teach families and patients how to minimize exposure to environmental asthma triggers.

CDC and NIH will work with state and local health departments to develop and evaluate the cost-effectiveness of model public health intervention programs.

NIH and HUD will complete the first National Allergen Survey to provide estimates of allergen exposure for the U.S. population; this survey will provide much needed information about the apparent regional differences in allergen exposures.

NIH, with support from EPA for particulate air monitoring, will continue to fund the National Cooperative Inner-City Asthma Study (NCICAS), 1996-2000, which will determine the capacity of interventions to reduce asthma morbidity among inner city children.

EPA, NIH, and CDC will fund and conduct research in collaboration with the private sector to identify home construction, maintenance and occupancy practices that will reduce children's exposure to environmental agents that trigger asthma episodes.

As part of its program on energy efficient buildings, DOE will study the relative effectiveness of energy conservation strategies and technologies on reducing exposures to allergens.

## 2. PROGRAMS TO IMPROVE PUBLIC HEALTH

Implement public health programs that improve use of scientific knowledge to prevent and reduce the severity of asthma symptoms by reducing environmental exposures.

Despite uncertainty about the causes of the increase in asthma prevalence rates, much can and should be done to prevent severe illness and death from asthma and improve the quality of life of persons with asthma. Experts convened by the National Asthma Education and Prevention Program (NAEPP) coordinated by the National Institutes of Health (NIH) have reviewed the scientific literature and produced guidelines for managing asthma. These include specific recommendations for controlling environmental factors that contribute to asthma severity.

While there is consensus that NAEPP guidelines define the best diagnosis and management practices for asthma, dissemination of the guidelines must be expanded and adoption improved. Many clinicians do not include advice about environmental control in their patient education. Among families who do receive recommendations, adherence is generally low. Asthma is highly variable, and families need help establishing priorities for environmental control measures that will be suitable for their individual child's asthma and their family circumstances. Effective public health programs can provide this education and support.



For children without access to quality health care, appropriate instruction on the environmental triggers of asthma is impossible or severely limited. Emergency rooms or urgent care facilities may serve as the only source of primary care for such children. These settings should be recruited to provide the kind of education and links to chronic disease management services that are essential to reducing the severity and frequency of asthma attacks.

### A. PROMOTE CLINICIAN AND PATIENT IMPLEMENTATION OF NATIONAL GUIDELINES FOR REDUCING ENVIRONMENTAL RISKS THAT WORSEN ASTHMA.

#### KEY ACTIONS:

NIH will use appropriate existing partnerships and innovative mechanisms to ensure wider use of the most up-to-date Guidelines for the Diagnosis and Management of Asthma published and periodically updated by the NAEPP/NIH. These guidelines offer specific advice on the environmental management of asthma.

Encourage and assist health care practitioners, including doctors, nurses, and personnel in emergency rooms and urgent care facilities, to provide high quality patient education on reducing exposure to pollutants that trigger asthma.

NIH, CDC, and EPA will establish partnerships with managed care organizations to integrate strong messages about management of asthma into existing health education programs, emphasizing the environmental management of asthma.

HCFA will investigate ways to improve the management of asthma, following the NAEPP guidelines, in care provided to Medicaid beneficiaries under 18 years old in the Managed Care Program.

ATSDR will expand to ten the number of pediatric environmental health specialty units across the country. These specialty units will develop environmental medicine materials, health education activities, and risk communication strategies on issues related to asthma and the environment well as other environmental health hazards to children; these educational activities will target both primary care providers and persons potentially exposed to harmful pollutants. In addition, these specialty units will provide consultation services to primary care as well as clinical diagnostic services to patients upon referral.

#### **B. EXPAND SUPPORT FOR STATE AND LOCAL PUBLIC HEALTH ACTION.**

Recent advances in the treatment of asthma and in identifying the environmental triggers of asthma attacks make it possible to control and prevent symptoms at a level unheard of just ten years ago. But these gains have not been realized by many of our children. Public health agencies have a critical role in helping to reduce environmental factors affecting asthma and the human and financial toll of the disease. These programs should include the following components:

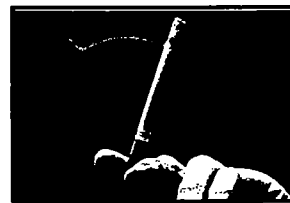
- (1) Education and training
- (2) Asthma surveillance
- (3) Coalitions for prevention

#### **KEY ACTION:**

CDC, in collaboration with NIH, will provide grants to 12 state health departments in FY 2000 to ensure that effective asthma education, prevention, and public health outreach activities in local communities are developed and sustained.

### C. REDUCE CHILDREN'S EXPOSURE TO ENVIRONMENTAL TOBACCO SMOKE AND OTHER INDOOR TRIGGERS IN THEIR HOMES.

Secondhand tobacco smoke and indoor allergens are major contributors to the incidence of wheezing in young children and play a significant role in the number and severity of asthma attacks. Reducing smoking in homes with young children will improve the health status of the estimated 2 million children with asthma who are exposed to secondhand smoke. In addition, exposure to allergens such as cockroach, house dust mite, mold, and animal dander causes many attacks of asthma that are preventable.



#### KEY ACTIONS:

EPA, CDC, and NIH will conduct a national public information campaign to reduce children's exposure to environmental tobacco smoke.

EPA, HUD, and CDC will work within existing public health programs that visit homes to increase the avenues through which parents and children receive key messages about asthma prevention and management. For example, partnerships with the extensive lead paint home intervention network, the AmeriCorps volunteers program, VISTA volunteer program, U.S. Department of Agriculture Extension Service, and the "Welfare to Work" program could all be used to bring asthma prevention messages (e.g., smoking and controlling allergens through techniques such as Integrated Pest Management) directly into millions of homes in a cost-effective manner.

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Exposure to secondhand smoke and allergens such as cockroach, house dust mite, mold, and animal dander causes many attacks of asthma that are preventable.

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EPA and DHHS, under the coordination of the National Asthma Education and Prevention Program and in close cooperation with the private sector, will undertake a national asthma awareness campaign, targeted at parents and emphasizing avoidable asthma triggers such as environmental tobacco smoke, indoor allergens, and outdoor air pollution episodes as well as early diagnosis and effective management.

HUD will collaborate with health departments with authority over low-income housing, home health educators, and building operators to implement appropriate guidance on building operation and maintenance practices, including ventilation, moisture control and integrated pest management techniques.

EPA will develop innovative means to disseminate information to persons and families with asthma on the health impact of ambient air pollutants, particularly ozone and particulate matter.

#### **D. ESTABLISH SCHOOL BASED ASTHMA PROGRAMS IN EVERY COMMUNITY.**

The educational system is a critical component of effective efforts to reduce illness due to asthma in children. Programs need to be implemented at the local school level to assure a healthy physical environment at the school and to promote improved self-management of asthma through education.

##### **KEY ACTIONS:**

Develop and expand partnerships between EPA, NIH, CDC, the Department of Education, and non-governmental public and private organizations to implement programs to assure that the school environment is safe for children with asthma. Such efforts should include expanding programs such as the Indoor Air Quality Tools for Schools Program.

EPA and NIH will collaborate with private and voluntary organizations to expand their successful school-based asthma management programs.

#### **E. CONTINUE TO REDUCE OUTDOOR AIR POLLUTION**

The U.S. EPA set national ambient air quality standards (NAAQS) for six air pollutants in 1971, in part based on evidence of associations between air pollutants such as ozone, particulate matter, and sulfur dioxide and asthma. Since that time substantial new epidemiological evidence has been published supporting the association between levels of ozone and particulate matter and increased hospitalization for respiratory causes, such as childhood asthma. In 1997, NAAQS for both ozone and particulate matter were strengthened to improve the protection afforded by these standards and to help reduce the risk of ambient exposures that aggravate asthma in children.



Federal, State, local, and private sector efforts to implement the original NAAQS resulted in substantial improvements in air quality, yet notable problems remain. Following the 1990 Clean Air Act Amendments, efforts were expanded to improve nationwide air quality and reduce related health effects. In conjunction with the strengthening of the ozone and particulate matter NAAQS, EPA has taken steps to integrate implementation measures for these pollutants and to improve the effectiveness of control programs. EPA has also taken steps to inform the public about air pollution that may affect children.

##### **KEY ACTIONS:**

EPA has proposed that twenty-two States revise their implementations programs in order to provide widespread regional reductions in ozone and related pollutants.

Revisions will be made to strengthen the Pollutant Standards Index (PSI) to help make the public more aware of days when air pollution levels could affect health and to alert individuals to steps which could be taken to mitigate health effects associated with exposure to air pollution.

The Environmental Monitoring for Public Access and Community Tracking (EMPACT) program will increase the availability of real time ozone data over the Internet and through local TV weather broadcasts.

### 3. SURVEILLANCE

Establish a coordinated nationwide asthma surveillance system for collecting and analyzing health outcome and risk factor data at the state, regional and local levels.

Current national surveillance permits tracking of asthma prevalence, asthma physician office visits, asthma emergency room visits, asthma hospitalizations and asthma mortality at a national level and in four geographic regions (i.e., Northeast, Midwest, South, and West) through surveys conducted by the National Center for Health Statistics. Surveillance information on asthma, with the exception of mortality data, are not available at the state or local level. This information is needed to identify high risk populations and environmental risk factors of relevance to particular communities and to design and implement interventions that will be most suitable for, and therefore most likely to succeed, in that community. State and local health agencies also need this information to evaluate the impact of local sources of air pollution on childhood asthma in specific communities. A significantly enhanced and expanded surveillance program will be essential to study issues related to race and gender differences in asthma morbidity and mortality among children, identify gaps in providing comprehensive care, and monitor trends in asthma morbidity and mortality at the community level.

#### KEY ACTIONS:

CDC, in collaboration with NIH, will work with state and local health departments to build a national asthma surveillance system. The first priority in this work will be to develop the state and local infrastructure that will be needed to collect, analyze, and interpret data at the local level. The surveillance system will consist of the following components:

- ▶ Annual surveys of states and major metropolitan areas using standard instruments and methods to define the prevalence of asthma, to characterize the severity of asthma and the quality of life for persons with asthma, and to assess the quality of asthma management
- ▶ Systematic, periodic examinations of existing mortality and morbidity data at state/city or county level to determine: deaths, hospitalizations, and emergency room visits for asthma.

- ▶ Expanded capability to integrate analysis of ambient air monitoring data with asthma morbidity and mortality data.
- ▶ Modify existing data collection systems as needed, to ensure the ability to measure progress toward the Healthy People 2010 goals, now under development.
- ▶ Follow-up studies of geographic and population groups with elevated asthma prevalence rates and elevated rates of morbidity.

#### 4. DISPROPORTIONATE IMPACTS ON THE POOR AND MINORITIES

Identify the reasons for and eliminate the disproportionate burden of asthma among different racial and ethnic groups and those living in poverty.

Poor and minority children are disproportionately affected by asthma, which has reached epidemic proportions in many American inner cities. Prevalence rates vary only by a few percentage points among different race and ethnic groups, yet emergency room use, hospitalization, and mortality rates vary 3- to 4-fold. Understanding the factors that contribute to the disproportionate impact of asthma on minority and lower income populations is the critical first step to reducing and eventually eliminating the disparities between rich and poor, minority and non-minority children. Such factors may include differing intensities of environmental exposures, such as exposure to cockroach antigen and access to and quality of care, among others.

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Poor and minority children are disproportionately affected by asthma, which has reached epidemic proportions in many American inner cities.

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##### A. CONDUCT RESEARCH AND SURVEILLANCE ACTIVITIES TO IMPROVE UNDERSTANDING OF THE PROBLEM

CDC, NIH and ATSDR will conduct research and collect surveillance data to better define factors contributing to asthma morbidity and asthma prevalence in minority and lower socioeconomic populations. Such data will:

- ▶ Separate roles of geography and environmental factors from ethnicity and socio-cultural variables in assessing their contribution to asthma prevalence.

- ▶ Examine the differences in asthma prevalence in Hispanics of different origins in order to provide some clues on risk factors contributing to higher rates of asthma.
- Examine the influence of poverty versus racial and ethnic group on use of emergency room services and hospitalization rates.

**B. IMPLEMENT PROGRAMS TO ELIMINATE THE DISPROPORTIONATE IMPACT OF ASTHMA IN MINORITY POPULATIONS AND THOSE LIVING IN POVERTY.**

**KEY ACTIONS:**

NIH, EPA, and CDC will implement public health interventions directed specifically to relieve the impact of asthma on vulnerable populations, particularly targeting the environmental exposures of vulnerable populations

- Ensure a substantial and appropriate focus of public health asthma initiatives on vulnerable populations.
- Make culturally and linguistically appropriate information on asthma widely available.
- Expand the availability of services, particularly emphasizing the need to modify the environment to reduce exposure to known asthma triggers, to the under-served in lower socioeconomic communities.

EPA will collaborate with state environmental protection programs to establish targeted compliance monitoring and enforcement efforts in communities with higher than average childhood asthma morbidity and mortality rates.

# GLOSSARY

**Acute:** Brief (days to weeks).

**Allergen:** A chemical or biological substance (e.g. pollen, animal dander, or house dust mite proteins) that causes an allergic reaction, characterized by hypersensitivity.

**Asthma:** A chronic lung disease with chronic inflammation of the airways and recurring exacerbations of airflow limitation that result in wheezing, cough, chest tightness, and difficulty breathing.

**Atopy:** The genetically inherited susceptibility to become allergic.

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

**Exacerbate:** To aggravate or make asthma worse.

**Genome:** The inherited genetic composition of an organism.

**Incidence:** The number of individuals that develop an abnormality within a given time (usually a year) expressed as a percentage of the population.

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

**Primary Prevention:** Interventions designed to prevent the development of asthma.

**Prevalence:** The percentage of the population with a disease, disorder, or abnormality.

**Secondary Prevention:** Interventions designed to prevent the worsening of asthma among individuals who already have the disease.

**Surveillance:** The ongoing collection, analysis, interpretation, and dissemination of health outcome data used to plan and evaluate public health programs.

**Trigger:** An exposure that causes symptoms or exacerbations of asthma.

# ADDITIONAL READING

## Technical

National Heart, Lung, and Blood Institute, National Asthma Education and Prevention Program. *Expert Panel Report 2: Guidelines for the Diagnosis and Management of Asthma*. National Institutes of Health pub no 97-4051. Bethesda, MD, 1997.

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Institute of Medicine. *Indoor Allergens. Assessing and Controlling Adverse Health Effects*. National Academy Press. Washington, D.C. 1993

## Families

American Lung Association. *Family Guide to Asthma and Allergies. How You and Your Children Can Breathe Easier*. Little, Brown and Company. New York. 1997

National Heart, Lung, and Blood Institute, National Asthma Education and Prevention Program. *Asthma, Physical Activity and School*. National Institutes of Health pub no 95-3651. Bethesda, MD, 1995.

National Heart, Lung, and Blood Institute, National Asthma Education and Prevention Program. *Facts About Controlling Your Asthma*. National Institutes of Health pub no 97-2339. Bethesda, MD, 1997.

National Heart, Lung, and Blood Institute. Global Initiative for Asthma. *What You and Your Family Can Do About Asthma*. National Institutes of Health pub no 96-3659C. Bethesda, MD, 1996.

## Indoor Air Pollution

EPA's *Indoor Air Quality Tools for Schools*. Available from:  
Indoor Air Quality Information Clearinghouse: 1-800-438-4318  
Indoor Air Quality Web Site: [www.epa.gov/iaq/](http://www.epa.gov/iaq/)

# TIPS FOR AVOIDING AND CONTROLLING ASTHMA TRIGGERS

## Tobacco Smoke

- ✓ Do not allow smoking in your home or around your children.
- ✓ Be sure no one smokes at a child's day care center.

## Dust Mites

- ✓ Cover pillows and mattresses with plastic or other allergen-impermeable material.
- ✓ Reduce humidity below 50% and, if dehumidifiers are used, keep them clean according to manufacturer's instructions.
- ✓ Soft, fabric-covered surfaces (such as carpeting and upholstered furniture) may harbor dust mites; hard surfaces are easier to clean.
- ✓ When vacuuming, use a high efficiency particulate air (HEPA) filter or central vacuum system. Because vacuuming causes increased levels of mite allergen in the air, have the allergic individual wear a mask or stay away while the building is being vacuumed.
- ✓ Wash bedding in hot water.

## Cockroaches and Rodents

### Use Integrated Pest Management (IPM):

- ✓ Thoroughly clean; remove all cockroach bodies and residues.
- ✓ Keep all surfaces clean and dry.
- ✓ Repair any water leaks.
- ✓ Keep all food away from pests, store in refrigerator or in tightly-sealed containers.
- ✓ Reduce/eliminate exposure to pesticides.

## Pet Dander

### At home:

- ✓ Choose pets based on the sensitivity of the allergic person.
  - ✓ Restrict activity of/isolate pet from sensitive persons (may not be effective with cat allergen which may stay suspended in air for long periods).
- ### Day care/schools:
- ✓ Keep animals in cages as much as possible; do not let them roam.
  - ✓ Clean cages regularly.
  - ✓ Locate animals away from ventilation system vents to avoid circulating allergens throughout the room or building.
  - ✓ Don't use warm-blooded animals, if possible.

## Mold

- ✓ Reduce humidity below 50% and prevent condensation.
- ✓ Control moisture sources.
- ✓ Repair any water leaks.
- ✓ Replace water-damaged materials.
- ✓ Don't leave water standing in your home.
- ✓ If you use a humidifier, choose and use it wisely according to manufacturer's instructions.

## Outdoor Air Pollution

### During air pollution alerts:

- ✓ Stay indoors as much as possible.
- ✓ Avoid strenuous physical activity.

Adapted from: National Heart, Lung, and Blood Institute, National Asthma Education and Prevention Program. *Expert Panel Report 2: Guidelines for the Diagnosis and Management of Asthma.*

## ADDITIONAL READING

### Technical

National Heart, Lung, and Blood Institute, National Asthma Education and Prevention Program. *Expert Panel Report 2: Guidelines for the Diagnosis and Management of Asthma*. National Institutes of Health pub no 97-4051. Bethesda, MD, 1997.

Mannino DM, Homa DM, Pertowski CA, et al., *Surveillance for Asthma, United States, 1960-1995* MMWR 1998;47(No. SS-1):1-27.

Institute of Medicine. *Indoor Allergens. Assessing and Controlling Adverse Health Effects*. National Academy Press Washington, D.C. 1993

### Families

American Lung Association. *Family Guide to Asthma and Allergies. How You and Your Children Can Breathe Easier*. Little, Brown and Company New York. 1997

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National Heart, Lung, and Blood Institute. Global Initiative for Asthma. *What You and Your Family Can Do About Asthma*. National Institutes of Health pub no 96-3659C Bethesda, MD, 1996

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Indoor Air Quality Information Clearinghouse: 1-800-438-4318  
Indoor Air Quality Web Site: [www.epa.gov/iaq/](http://www.epa.gov/iaq/)

# Centers for Disease Control and Prevention Facsimile Transmission

Date: 10 Nov 98

To: Devorah Adler

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Subject: Asthma document

Pages (including cover sheet): ~30

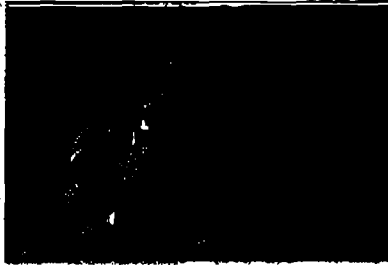
Comments: \_\_\_\_\_

1800 979 1252  
Dan

**DRAFT**  
10/9/98

# **Asthma in America: Our Children at Risk**


## **A Plan for Environmental Action to Protect Children from Asthma**



**President's Task Force on Environmental Health  
Risks and Safety Risks to Children**

## **ABOUT THE PRESIDENT'S TASK FORCE ON ENVIRONMENTAL HEALTH RISKS AND SAFETY RISKS TO CHILDREN**

In recognition of the growing body of scientific information demonstrating that America's children suffer disproportionately from environmental health risks and safety risks, President Clinton issued Executive Order 13045 on April 21, 1997, directing each Federal Agency to make it a high priority to identify, assess, and address those risks. In issuing this order, the President also created the Task Force on Environmental Health Risks and Safety Risks to Children, co-chaired by Donna Shalala, Secretary of the Department of Health and Human Services, and Carol M. Browner, Administrator of the Environmental Protection Agency. The Task Force was charged with recommending strategies for protecting children's environmental health and safety. Two subcommittees were established in the Executive Order to carry out this directive: a subcommittee directed to review and foster public access to federal government sponsored research on environmental health and safety risks to children, and a subcommittee directed to identify priority public outreach activities related to protecting children's environmental health and safety.



In April 1998, the Task Force identified four priority areas for immediate attention: childhood asthma, unintentional injuries, developmental disorders, and childhood cancer. The Task Force created and charged the Asthma Priority Area Workgroup with reviewing current Federal efforts to address the many facets of the issue and, most importantly, to make appropriate recommendations for action by the Federal government. This report is the result of that effort.

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## EXECUTIVE SUMMARY

An epidemic of asthma is occurring in the United States. While the epidemic affects people of all ages, children are particularly affected. Nearly 1 in 13 school-aged children has asthma, and the percentage of children with asthma (i.e., prevalence rate) is rising more rapidly in preschool-aged children than in any other age group.

There is no national system to collect data from states specifically on asthma, although several states are developing systems to collect such data. Although national data do not provide the resolution necessary to identify particular geographic areas hardest hit by the asthma epidemic, surveys undertaken in a number of large cities in the United States indicate that the prevalence and severity of asthma are greatest in the large, urban inner cities.

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Asthma is one of the leading causes of school absenteeism, accounting for over 10 million missed school days per year. Asthma also accounts for many nights of interrupted sleep, limitation of activity, and disruptions of family and care-giver routines. Asthma symptoms that are not severe enough to require a visit to an emergency room or to a physician can still be severe enough to prevent a child with asthma from living a fully active life.

In 1990, the cost of asthma to the U.S. economy was estimated to be \$6.2 billion, with the majority of the expense attributed to direct medical expenses. A 1996 analysis found the cost of asthma to be \$14 billion, indicating a rapidly increasing financial burden. These estimates, which are not limited to the costs of childhood asthma, indicate that the direct medical costs of asthma account for between 1% and 3% of all health care expenditures in the United States.

Asthma is a particularly important disease to consider in the context of environmental hazards to which children are exposed. Children breathe more air, eat more food, and drink more liquid in proportion to their body weight than do adults, and their developing respiratory, immunological, and digestive systems may be more susceptible to environmental exposures than those of adults. In a typical day, children may be exposed to a wide array of environmental agents at home, in day-care centers, schools and while playing outdoors. There is substantial evidence that environmental exposures, including viruses and allergens, play a major role in triggering asthma symptoms. Airborne allergens include those from house dust mites, cockroaches, mold and animal dander. In addition, exposure to environmental tobacco smoke has been shown to be a major determinant of asthma symptoms. Elevated levels of outdoor air pollutants, particularly ozone, are associated with increased symptoms and an increased risk of emergency department visits for asthma, as well.

In addition, environmental factors such as airborne allergens and environmental tobacco smoke (i.e., secondhand smoke) may play a major role in the onset of asthma. Other pollutants may also play a role, although the scientific data are inadequate to offer firm conclusions. Genetic

predisposition is the strongest known risk factor for developing asthma, but the rapidly rising number of cases of childhood asthma cannot be solely genetic because the genetic composition of the population changes slowly. Rather, some interaction between genetic predisposition and environmental exposures, and possibly other factors such as diet or lack of exercise are likely to be responsible for the increase. Further work is essential to clarify how genetic susceptibility and environmental exposures interact to cause asthma.

Reducing exposures of children with asthma to airborne allergens and pollutants will reduce the health burden of asthma and significantly improve their quality of life. It is not yet certain, but it is possible that reducing the exposure of infants and young children at risk of developing asthma may prevent its onset. Environmental control methods and asthma treatments are available now that can help children and their families control asthma and lead healthy, active lives. Yet not all children have access to these measures. Too many children miss school, limit their physical activity, and are seriously ill because of asthma.

The environmental action plan for asthma outlined in this report is designed to promote concerted Federal action to protect all children with asthma from environmental risks that worsen their disease and to expand federal research to reveal how reducing environmental risks might prevent children from getting asthma.



## GUIDING PRINCIPLES

Federal agency actions can provide leadership and direction in reducing environmental risks to protect children from asthma. Recommendations for action put forward in this initiative are predicated on the principles that federal action must have:

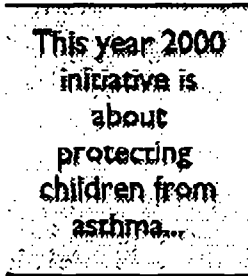
- A focus on efforts to *eliminate the disproportionate impact of asthma in minority populations and those living in poverty.*
- An emphasis on *partnerships and community based programs.*
- A commitment to setting *measurable and consistent goals* for childhood asthma under the Healthy People 2010 program.
- *An investment in evaluation* to identify those strategies that are most effective in reducing the burden of asthma so that they may be replicated.

## RECOMMENDATIONS FOR ACTION

### RESEARCH

Strengthen and accelerate focused research into the environmental factors that cause or worsen childhood asthma.

- ⊕ Strengthen and accelerate research into the environmental factors that may contribute to the onset of asthma in children.
- ⊕ Expand and accelerate research to develop and evaluate environmental strategies that will improve the quality of life of people with asthma.



### PUBLIC HEALTH PROGRAMS

Implement public health programs that foster improved use of current scientific knowledge to reduce environmental exposures to prevent and reduce the severity of symptoms for those with asthma.

- ⊕ Promote clinician and patient implementation of national guidelines for reducing environmental risks that worsen asthma.
- ⊕ Expand support for state and local public health action.
- ⊕ Reduce children's exposure to environmental tobacco smoke and other indoor triggers in their homes.
- ⊕ Establish school based asthma programs in every community that help reduce or eliminate allergens and irritants and that promote student's self management of asthma and full participation in school activities.
- ⊕ Continue to reduce outdoor air pollution.

### SURVEILLANCE

Establish a coordinated, integrated, and systematic nationwide asthma surveillance system for collecting and analyzing health outcome and risk factor data at the state, regional and local levels.

### DISPROPORTIONATE IMPACT ON THE POOR AND MINORITIES

Eliminate the disproportionate burden of asthma among different racial and ethnic groups and those living in poverty.

- ⊕ Conduct research and surveillance activities to improve understanding of the problem.
- ⊕ Implement activities to eliminate the disproportionate impact of asthma in minority populations and those living in poverty.

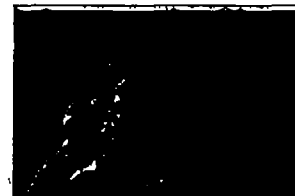


# INTRODUCTION

## The Growing Problem of Asthma in Children

Asthma is a chronic lung disease characterized by recurrent episodes of breathlessness, wheezing, coughing, and chest tightness; these episodes are also known as exacerbations or attacks. The severity of exacerbations can range from mild to life threatening. Both the frequency and severity of asthma symptoms can be reduced by the use of medications and by reducing exposure to the environmental triggers of asthma attacks.

For the past 15 years, an epidemic of asthma has occurred in the United States. By all indications, this epidemic is continuing. Although asthma has become a major public health problem affecting Americans of all ages, races and ethnic groups, children have been particularly severely affected.



National survey data -- the responses of randomly selected U.S. residents being asked whether they had symptoms of physician diagnosed asthma in the previous 12 months -- indicate that the number of children with asthma in the United States has more than doubled in the past 15 years. In 1980, 2.3 million American children had asthma. In 1995, the most recent year for which data are available, the number of affected children had risen to 5.5 million. Based on these trends, it is estimated that in 1998 more than 6 million children in the United States have asthma. Prevalence rates of asthma are highest in boys and are increasing in both boys and girls, and in all race and ethnic groups. The prevalence of asthma in children under age 18 is 7.3%. The most rapid increase has occurred in children under 5 years old, with rates increasing over 160% over the past 15 years.

The number of deaths attributed to asthma in children has also increased. In 1977, 84 deaths in children 18 and younger were recorded; the number of deaths has risen to 280 in 1995, a more than 3-fold increase. Although the death rate due to asthma has increased in all racial and ethnic groups, minority populations experience a disproportionately higher death rate from asthma. In 1995, the death rate from asthma in African-American children, 11.5 per million, was over four times the rate in white Americans, 2.6 per million. The higher death rates among African-American children are especially troubling.

The number of hospitalizations and emergency room visits for asthma have increased in all population groups. Asthma accounts for one-third of all pediatric emergency room visits and is the fourth most common cause for physician office visits. The variation in the impact of asthma across racial and ethnic groups is significant. African American children have an annual rate of hospitalization of 74 per 10,000, over 3 times that for whites, 21 per 10,000. In addition, African American children are approximately 4 times more likely than white children to seek care at an emergency room. In short, African-American children have a slightly higher risk of getting asthma, but have a much higher risk of hospitalization or death due to the disease.

At the present time, surveillance for asthma in children is limited to analyses of ongoing surveys and data systems on health events such as mortality, hospitalization, and outpatient visits. Other than for African Americans, such information is extremely limited for most ethnic groups. There is no national system to collect data from states specifically on asthma, although several states are developing systems to collect such data. Although national data do not provide the resolution necessary to identify particular geographic areas hardest hit by the asthma epidemic, surveys undertaken in a number of large cities in the United States indicate that the prevalence and severity of asthma are greatest in the large, urban inner cities.

There is no national system to collect data from states specifically on asthma, although several states are developing systems to collect such data.

These measures, particularly for death, hospitalization, and emergency room visits, give an incomplete picture of the true burden of asthma in the United States. For example, one follow-up study of children with asthma in inner city areas found a nearly 10 times higher likelihood of a child suffering symptoms of asthma on a given day than visiting an emergency room. Asthma is one of the leading causes of school absenteeism, accounting for over 10 million missed school days per year. Asthma also accounts for many nights of interrupted sleep, limitation of activity, and disruptions of family and care-giver routines. Asthma symptoms that are not severe enough to require a visit to an emergency room or to a physician can still be severe enough to prevent a child with asthma from living a fully active life.

Estimating the costs of asthma is an indirect way to measure its health burden. In 1990, the cost of asthma to the U.S. economy was estimated to be \$6.2 billion, with the majority of the expense attributed to direct medical expenses. A 1996 analysis found the cost of asthma to be \$14 billion, indicating a rapidly increasing financial burden. These estimates indicate that the direct medical costs of asthma for all ages account for between 1% and 3% of all health care expenditures in the United States.

## What We Know About Childhood Asthma

Over the past 15 years, there have been major advances in the scientific understanding of asthma. Asthma is now known to be a disease of airway inflammation resulting from a complex interplay between environmental exposures and genetic and other factors. This has implications for the medical treatment and for the environmental management of asthma.

In contrast to the limited understanding of the relationship of environmental exposures to the onset of asthma, the environmental triggers of asthma attacks for children with asthma have become increasingly well characterized. House dust mites, cockroaches, mold and animal dander have been identified as the principal allergens that trigger asthma symptoms. Reducing exposure to these allergens has been shown not only to reduce asthma symptoms and the need for medication, but also to improve lung function. Environmental tobacco smoke (also called secondhand smoke) is an important irritant that can trigger an asthma episode and possibly potentiate the effects of allergens. Upper respiratory viral infections are also recognized as

important triggers for asthma episodes.

Children with asthma have long been recognized as particularly sensitive to outdoor air pollution. Many common air pollutants, such as ozone, sulfur dioxide, and particulate matter are respiratory irritants and can exacerbate asthma. Air pollution also might act synergistically with other environmental factors to worsen asthma. For example, some evidence suggests that exposure to ozone can enhance a person's responsiveness to inhaled allergens. Whether long term exposure to these pollutants can actually contribute to the development of asthma is not known, though scientists do not believe that outdoor air pollution is a major contributor to the current epidemic. To date, little research has examined the role of other air pollutants in the development or exacerbation of asthma, although this is an issue of increasing public concern.

Children with asthma have long been recognized as particularly sensitive to outdoor air pollution.

In addition to improved understanding of appropriate environmental management of asthma, the medical management of asthma has changed significantly. Inhaled anti-inflammatory medications have become the mainstay of medical management to prevent asthma episodes and lessen chronic symptoms of asthma. In addition, improvements in monitoring techniques now permit objective measures of lung function that are easy for patients and physicians to use in assessing asthma severity and monitoring changes in the disease. In a disease like asthma that varies considerably over time and where changes in lung function can occur before symptoms develop, these objective measures are essential tools for making management decisions.

As a result of these advances, the medical and environmental management of asthma is better defined and the knowledge exists to manage asthma better than ever before. One especially important finding is that patient education has been documented to be cost effective. Teaching patients and their families specific management skills improves asthma management, reduces the use of emergency services, and improves quality of life. This is particularly important for asthma management, since the environmental management of asthma requires knowledge of asthma triggers and specific actions that can be undertaken to reduce exposure to these triggers. The treatment goal for almost all individuals with asthma should be for that person to lead a life unrestricted because of asthma.

Reducing exposure to environmental allergens and pollutants will reduce the frequency and severity of attacks for children with asthma, reduce their need for medicine, and improve their lung function. Children are exposed to many environmental agents that could trigger asthma attacks. For example, 25% of children in America live in areas that regularly exceed EPA limits for ozone. Approximately 38% of children are exposed to environmental tobacco smoke in the home on a regular basis and exposure to environmental tobacco smoke is so widespread that approximately 88% of all children have some level of documented exposure. A high proportion of children living in the inner city are exposed to high levels of cockroach antigen.

## Why Has Asthma Reached Epidemic Proportions in Children?

The causes of the increasing rate of asthma over the past 15 years and the particular role that environmental exposures play are not known, but there are some clues. Atopy, the genetically inherited susceptibility to become allergic, is the most important predictor of a child developing asthma. A substantial research effort is underway to identify the genes that are responsible for susceptibility to asthma. Because the genetic make-up of the population changes slowly, genetic susceptibility alone cannot be responsible for the epidemic of asthma that has occurred in the United States over the past 15 years. Further work is essential to clarify how genetic susceptibility and environmental exposures interact to cause asthma. Factors such as the intensity of environmental exposure and the age of the person being exposed are likely to be important.

Exposure to allergens found indoors is a strong risk factor for developing asthma. Children are spending increasing amounts of time indoors, thus increasing their exposure to indoor allergens.

The environmental exposures most strongly suspected of causing asthma to develop include environmental tobacco smoke and allergens such as house dust mites, cockroaches, mold, and animal dander. Exposures that stimulate the immune system may also be significant, such as diet during the prenatal period and early infancy, the pattern of respiratory infections early in life, and even decreasing rates of exercise have all been suggested as risk factors for the development of asthma. In the broadest sense, many environmental exposures are suspected of contributing to the epidemic of asthma in children.

## Scope of the Plan for Environmental Action to Protect Children With Asthma

This action plan is about protecting children from asthma and the consequences of asthma. To accomplish this goal, the environmental aspects of asthma must be considered in the context of other aspects of asthma prevention and management, such as early access to quality medical care and efforts to understand the disproportionate health impact of asthma among minority populations. Childhood asthma is a multi-factorial disease, and efforts to improve its management and to prevent it will require multi-dimensional, multi-disciplinary efforts that must occur simultaneously. This action plan focuses on improving the environment in which children with asthma live, learn, play and work so that they can live productive, active lives and so that future generations of children might be spared the disease altogether.

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## GOALS OF THE CHILDREN'S ENVIRONMENTAL HEALTH ASTHMA ACTION PLAN

BY THE YEAR 2005, THE NUMBER OF HOUSEHOLDS IN WHICH CHILDREN ARE REGULARLY EXPOSED TO SECONDHAND SMOKE WILL BE REDUCED TO 15%.

BY THE YEAR 2010, GUIDELINES FOR PREVENTING THE ONSET OF ASTHMA WILL BE DEVELOPED.

BY THE YEAR 2010, THE INCREASING RATE OF ASTHMA PREVALENCE IN CHILDREN WILL BE HALTED.

BY THE YEAR 2010, EVERY CHILD IN AMERICA WILL HAVE PROMPT, AFFORDABLE, AND CONVENIENT ACCESS TO THE MOST EFFECTIVE ASTHMA MANAGEMENT TECHNIQUES AVAILABLE.

BY THE YEAR 2010, ASTHMA HOSPITALIZATION RATES IN CHILDREN WILL HAVE FALLEN TO NO MORE THAN 10 HOSPITALIZATIONS PER 10,000 PEOPLE.<sup>2</sup> (HP 2010 DRAFT)

BY THE YEAR 2010, EMERGENCY DEPARTMENT VISITS WILL BE REDUCED TO NO MORE THAN 46 PER 10,000 PEOPLE.<sup>3</sup> (HP 2010 DRAFT)

BY THE YEAR 2010, NO MORE THAN 10% OF PEOPLE WITH ASTHMA WILL EXPERIENCE ACTIVITY LIMITATIONS.<sup>4</sup> (HP 2010 DRAFT)

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1 Baseline: 29% in 1994. Source: Biennial Radon and ETS Survey of the Conference of Radiation Control Program Directors and EPA.

2 Baseline: Hospitalization rate per 10,000 population in 1993-94: 18 for total population; 50 for children 0-4 yrs of age and 18 for children 5-14 yrs. Source: HP2010 Draft

3 Baseline: Emergency room visits 71 per 10,000 population for total population in 1992-94; 121 for children 0-4 yrs of age and 81 for children 5-14 yrs. Source: HP2010 Draft

4 Baseline: Activity limitation for persons with asthma 22 percent for overall population in 1992-94. No children-specific data available. Source: HP2010 Draft

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## **VISION FOR THE 21<sup>ST</sup> CENTURY**

**Every child in America will live,  
learn, work, and play in  
environments that do not cause or  
worsen asthma.**

**Asthma will no longer inhibit  
children from leading full and active  
lives.**

**More cost-effective medical and  
environmental asthma prevention  
and management tools will enhance  
the lives of children and their  
families.**

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## GUIDING PRINCIPLES

Federal agency actions can provide leadership and direction in reducing environmental risks to protect children from asthma. Recommendations for action put forward in this plan are predicated on the principles that federal action must have:

**1. A focus on efforts to better understand and eliminate the disproportionate impact of asthma in minority populations and those living in poverty.**

The health burden of asthma is not shared equally throughout the U.S. population. Although the rising prevalence of asthma has affected all populations, poor and minority children are much more likely than white, non-Hispanic children to visit an emergency room, to be hospitalized, or to die from asthma. The reasons for this inequity are not known, although environmental exposures and limited access to quality medical care may all play a role.

The focus on eliminating disparities across racial and ethnic groups has to be considered in all efforts to prevent asthma and its health impact; however, because of the importance of this issue the committee has included a specific recommendation in this action plan to examine, understand, and ultimately eliminate disparities.

**2. An emphasis on partnerships and community based programs.**

A successful effort to reduce childhood asthma will depend in part on the level of success achieved in enlisting all sectors of society in efforts to implement effective programs to prevent and manage the disease. Federal agencies have already forged effective partnerships with many health and professional organizations, corporations, and foundations to conduct training, educate health care providers and the public, and to implement a wide range of prevention activities at the national, state, and local levels.

Expanded partnerships both within government and between government and the private sector are needed. With increasing knowledge about the primary causes of asthma and triggers of asthma attacks, the challenge for the 21<sup>st</sup> century will be to learn to integrate successfully these findings into more effective environmental, medical and educational programs. Partnerships will be critical to implementing this broad vision of asthma control. In particular, community-based programs should integrate asthma control activities into existing systems such as schools, child care, youth programs, workplaces, primary health, correctional facilities, and job training programs.

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The challenge for the 21<sup>st</sup> century will be to learn to integrate successfully these findings into more effective environmental, medical and educational programs.

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**3. A commitment to setting measurable and consistent goals for childhood asthma under the Healthy People 2010 program.**

Health objectives are now being developed for the year 2010 and represent a significant revision of the goals set for the year 2000. These objectives will set the nation's health agenda for increasing years of healthy life and reducing disparities among the entire American population. Draft objectives currently encompass an expanded set of asthma-related objectives as well as a series of environmental objectives addressing known asthma triggers such as indoor allergens, secondhand smoke and outdoor air pollution.

The goals embodied in the final Healthy People 2010 document will serve as the tools to measure progress towards control of asthma. Although some of the goals are likely to measure aspects of asthma clinical management that will not be directly affected by this action plan, the primary objectives of morbidity reduction and reducing exposures to environmental hazards will be addressed.

**4. Investment in evaluation of programs to identify those strategies that are most effective in reducing the burden of asthma so that they may be replicated.**

Asthma intervention programs and related activities need to be fully evaluated to determine those techniques which are successful and should be replicated. Evaluation should be incorporated in the planning and should include:

- identification of desired health outcomes of the program;
- measurement of effectiveness of the intervention activities and processes used to implement them;
- identification of unforeseen obstacles;
- assessment of the cost-effectiveness of the program;
- a prediction of long term sustainability of the program.

# RECOMMENDATIONS FOR ACTION

## I. RESEARCH

**Strengthen and accelerate focused research into the environmental factors that cause or worsen childhood asthma.**

### **A. EXPAND RESEARCH INTO THE ENVIRONMENTAL FACTORS THAT CONTRIBUTE TO THE ONSET OF ASTHMA IN CHILDREN.**

Though progress has been made in understanding what causes asthma, there is currently insufficient scientific information to establish specific guidelines and recommendations for public health practices to prevent the onset of asthma in children (i.e. primary prevention).

In order to establish primary prevention guidelines, the top priority for research is to determine the causes of asthma in children and particularly the role of the environment. To understand what causes asthma, research must identify the basic cellular and molecular mechanisms that cause airway inflammation and sensitization and, in particular, the interaction of environmental exposures and genetic susceptibility. In addition, clinical and epidemiologic studies are needed to examine the relationship between environmental exposures and the onset of asthma.



Because of promising preliminary work on the relationship of indoor allergens and asthma onset, as well as the much greater proportion of time that children spend indoors, greater emphasis on examining the relationship of indoor exposures to the development of asthma is warranted. Exposures to high levels of allergens in the indoor environment have been shown in some studies to be associated with the subsequent development of asthma. However, few studies have examined the influence of geographic location on the role of allergens. In studies evaluating the role of indoor allergens on exacerbations of asthma, different allergens, such as those associated with cockroaches, dust mites, and mold, have been implicated in different locations. This suggests that different allergens can exacerbate asthma, and that different allergens may be capable of inducing the new onset of asthma.

In one study, avoiding exposure to dust mite and food allergens early in life was found to reduce the risk of developing asthma in the first year of life. However, this effect was not statistically significant at 2 to 4 years of age. Whether such allergen avoidance strategies are feasible and effective in reducing the development of asthma is not known.

The complex interactions between outdoor air pollutants and allergens and the development of asthma have not been adequately evaluated. Some epidemiologic studies have suggested a relationship between exposure to volatile organic compounds and prevalence rates of childhood asthma. Because adult-onset asthma is known to be associated with occupational exposures to volatile organic compounds including formaldehyde, ethylene oxide, and isocyanates, further work to assess the possible etiologic role of specific pollutants in childhood asthma is appropriate.

Exposures to high levels of allergens in the indoor environment have been shown in some studies to be associated with the subsequent development of asthma.

#### KEY ACTIONS:

NIH, CDC, and EPA will conduct and fund studies to determine the causes of asthma. Such studies should include the following:

- ▶ examine the role of genetic susceptibility to specific environmental exposures in the development of asthma;
- ▶ assess the importance of early life events, such as *in utero* viral infections, viral infections during infancy, specific antigen exposures and exposures to maternal smoking on the development of asthma;
- ▶ examine the effects of pollutants and allergens on immune responses in animal models and in preclinical studies;
- ▶ identify the clinical characteristics of asthma associated with different genetic, physiologic, immunologic and environmental factors;
- ▶ examine the effectiveness of combinations of immune modulation to reduce IgE responses to allergen and allergen avoidance as a means to reduce the risk of developing asthma;
- ▶ examine the epidemiology of asthma in different populations to identify risk factors for the onset of asthma.

ATSDR, in partnership with state and local health departments and community groups, will investigate childhood asthma in 5-7 communities where sources of emissions from hazardous waste facilities have already been identified. These investigations will characterize any associations between hazardous materials and the burden of asthma in children.

In addition to intramural and extramural grant programs, NIH, CDC, and EPA will fund medical centers to conduct comprehensive research on environmental aspects of asthma.

The National Academy of Sciences, with support of EPA, will complete its assessment of asthma associated with indoor pollutants. These findings will be used to guide research efforts on the causes of asthma.

## **B. EXPAND AND ACCELERATE RESEARCH TO DEVELOP AND EVALUATE ENVIRONMENTAL STRATEGIES THAT WILL IMPROVE THE QUALITY OF LIFE FOR CHILDREN WITH ASTHMA.**

It is well established that inhaled allergens and irritants and outdoor pollutants provoke asthma symptoms. Research is needed to identify if other environmental exposures are significant. Further, the relative importance of various exposures is not well understood. Cost effective strategies for reducing exposures are not well developed.

Patient education strategies in certain populations have profound impacts on reducing the frequency and severity of exacerbations and improving the quality of life for children. But many of these programs are not responsive to the cultural, ethnic, and economic diversity of the American population. Innovative strategies are urgently needed for reaching a wide range of children and their families, for tailoring recommendations for reducing environmental exposures to their needs, and for providing support to follow the recommendations.

### **KEY ACTIONS:**

NIH and EPA will conduct studies to examine the interrelationship between indoor allergen exposures, viral infections, ambient air pollutants, and exacerbations of asthma. This research will include identifying and evaluating cost effective methods to reduce allergen exposures, as well as methods to render the immune system less susceptible to environmental exposures.

NIH, CDC and EPA will conduct studies to improve and evaluate interventions designed to teach families and patients how to minimize exposure to environmental asthma triggers.

CDC and NIH will work with state and local health departments to develop and evaluate the cost-effectiveness of model public health intervention programs.

NIH and HUD will complete the first National Allergen Survey to provide estimates of allergen exposure for the U.S. population; this survey will provide much needed information about the apparent regional differences in allergen exposures.

NIH, with support from EPA for particulate air monitoring, will continue to fund the National Cooperative Inner-City Asthma Study (NCICAS), 1996-2000, which will determine the capacity of interventions to reduce asthma morbidity among inner city children.

EPA, NIH, and CDC will fund and conduct research in collaboration with the private sector to identify home construction, maintenance and occupancy practices that will reduce children's exposure to environmental agents that trigger asthma episodes.

As part of its program on energy efficient buildings, DOE will study the relative effectiveness of energy conservation strategies and technologies on reducing exposures to allergens.

## 2. PROGRAMS TO IMPROVE PUBLIC HEALTH

**Implement public health programs that improve use of scientific knowledge to prevent and reduce the severity of asthma symptoms by reducing environmental exposures.**

Despite uncertainty about the causes of the increase in asthma prevalence rates, much can and should be done to prevent severe illness and death from asthma and improve the quality of life of persons with asthma. Experts convened by the National Asthma Education and Prevention Program (NAEPP) coordinated by the National Institutes of Health (NIH) have reviewed the scientific literature and produced guidelines for managing asthma. These include specific recommendations for controlling environmental factors that contribute to asthma severity.

While there is consensus that NAEPP guidelines define the best diagnosis and management practices for asthma, dissemination of the guidelines must be expanded and adoption improved. Many clinicians do not include advice about environmental control in their patient education. Among families who do receive recommendations, adherence is generally low. Asthma is highly variable, and families need help establishing priorities for environmental control measures that will be suitable for their individual child's asthma and their family circumstances. Effective public health programs can provide this education and support.



For children without access to quality health care, appropriate instruction on the environmental triggers of asthma is impossible or severely limited. Emergency rooms or urgent care facilities may serve as the only source of primary care for such children. These settings should be recruited to provide the kind of education and links to chronic disease management services that are essential to reducing the severity and frequency of asthma attacks.

### A. PROMOTE CLINICIAN AND PATIENT IMPLEMENTATION OF NATIONAL GUIDELINES FOR REDUCING ENVIRONMENTAL RISKS THAT WORSEN ASTHMA.

#### KEY ACTIONS:

NIH will use appropriate existing partnerships and innovative mechanisms to ensure wider use of the most up-to-date Guidelines for the Diagnosis and Management of Asthma published and periodically updated by the NAEPP/NIH. These guidelines offer specific advice on the environmental management of asthma.

Encourage and assist health care practitioners, including doctors, nurses, and personnel in emergency rooms and urgent care facilities, to provide high quality patient education on reducing exposure to pollutants that trigger asthma.

NIH, CDC, and EPA will establish partnerships with managed care organizations to integrate strong messages about management of asthma into existing health education programs, emphasizing the environmental management of asthma.

HCFA will investigate ways to improve the management of asthma, following the NAEPP guidelines, in care provided to Medicaid beneficiaries under 18 years old in the Managed Care Program.

ATSDR will expand to ten the number of pediatric environmental health specialty units across the country. These specialty units will develop environmental medicine materials, health education activities, and risk communication strategies on issues related to asthma and the environment well as other environmental health hazards to children; these educational activities will target both primary care providers and persons potentially exposed to harmful pollutants. In addition, these specialty units will provide consultation services to primary care as well as clinical diagnostic services to patients upon referral.

## **B. EXPAND SUPPORT FOR STATE AND LOCAL PUBLIC HEALTH ACTION.**

Recent advances in the treatment of asthma and in identifying the environmental triggers of asthma attacks make it possible to control and prevent symptoms at a level unheard of just ten years ago. But these gains have not been realized by many of our children. Public health agencies have a critical role in helping to reduce environmental factors affecting asthma and the human and financial toll of the disease. These programs should include the following components:

- (1) Education and training
- (2) Asthma surveillance
- (3) Coalitions for prevention

### **KEY ACTION:**

CDC, in collaboration with NIH, will provide grants to 12 state health departments in FY 2000 to ensure that effective asthma education, prevention, and public health outreach activities in local communities are developed and sustained.

### **C. REDUCE CHILDREN'S EXPOSURE TO ENVIRONMENTAL TOBACCO SMOKE AND OTHER INDOOR TRIGGERS IN THEIR HOMES.**

Secondhand tobacco smoke and indoor allergens are major contributors to the incidence of wheezing in young children and play a significant role in the number and severity of asthma attacks. Reducing smoking in homes with young children will improve the health status of the estimated 2 million children with asthma who are exposed to secondhand smoke. In addition, exposure to allergens such as cockroach, house dust mite, mold, and animal dander causes many attacks of asthma that are preventable.



#### **KEY ACTIONS:**

EPA, CDC, and NIH will conduct a national public information campaign to reduce children's exposure to environmental tobacco smoke.

EPA, HUD, and CDC will work within existing public health programs that visit homes to increase the avenues through which parents and children receive key messages about asthma prevention and management. For example, partnerships with the extensive lead paint home intervention network, the AmeriCorps volunteers program, VISTA volunteer program, U.S. Department of Agriculture Extension Service, and the "Welfare to Work" program could all be used to bring asthma prevention messages (e.g., smoking and controlling allergens through techniques such as Integrated Pest Management) directly into millions of homes in a cost-effective manner.

**Exposure to secondhand smoke and allergens such as cockroach, house dust mite, mold, and animal dander causes many attacks of asthma that are preventable.**

EPA and DHHS, under the coordination of the National Asthma Education and Prevention Program and in close cooperation with the private sector, will undertake a national asthma awareness campaign, targeted at parents and emphasizing avoidable asthma triggers such as environmental tobacco smoke, indoor allergens, and outdoor air pollution episodes as well as early diagnosis and effective management.

HUD will collaborate with health departments with authority over low-income housing, home health educators, and building operators to implement appropriate guidance on building operation and maintenance practices, including ventilation, moisture control and integrated pest management techniques.

EPA will develop innovative means to disseminate information to persons and families with asthma on the health impact of ambient air pollutants, particularly ozone and particulate matter.

## **D. ESTABLISH SCHOOL BASED ASTHMA PROGRAMS IN EVERY COMMUNITY.**

The educational system is a critical component of effective efforts to reduce illness due to asthma in children. Programs need to be implemented at the local school level to assure a healthy physical environment at the school and to promote improved self-management of asthma through education.

### **KEY ACTIONS:**

Develop and expand partnerships between EPA, NIH, CDC, the Department of Education, and non-governmental public and private organizations to implement programs to assure that the school environment is safe for children with asthma. Such efforts should include expanding programs such as the Indoor Air Quality Tools for Schools Program.

EPA and NIH will collaborate with private and voluntary organizations to expand their successful school-based asthma management programs.

## **E. CONTINUE TO REDUCE OUTDOOR AIR POLLUTION**

The U.S. EPA set national ambient air quality standards (NAAQS) for six air pollutants in 1971, in part based on evidence of associations between air pollutants such as ozone, particulate matter, and sulfur dioxide and asthma. Since that time substantial new epidemiological evidence has been published supporting the association between levels of ozone and particulate matter and increased hospitalization for respiratory causes, such as childhood asthma. In 1997, NAAQS for both ozone and particulate matter were strengthened to improve the protection afforded by these standards and to help reduce the risk of ambient exposures that aggravate asthma in children.



Federal, State, local, and private sector efforts to implement the original NAAQS resulted in substantial improvements in air quality, yet notable problems remain. Following the 1990 Clean Air Act Amendments, efforts were expanded to improve nationwide air quality and reduce related health effects. In conjunction with the strengthening of the ozone and particulate matter NAAQS, EPA has taken steps to integrate implementation measures for these pollutants and to improve the effectiveness of control programs. EPA has also taken steps to inform the public about air pollution that may affect children.

### **KEY ACTIONS:**

EPA has proposed that twenty-two States revise their implementation programs in order to provide widespread regional reductions in ozone and related pollutants

Revisions will be made to strengthen the Pollutant Standards Index (PSI) to help make the public more

aware of days when air pollution levels could affect health and to alert individuals to steps which could be taken to mitigate health effects associated with exposure to air pollution.

The Environmental Monitoring for Public Access and Community Tracking (EMPACT) program will increase the availability of real time ozone data over the Internet and through local TV weather broadcasts.

### 3. SURVEILLANCE

**Establish a coordinated nationwide asthma surveillance system for collecting and analyzing health outcome and risk factor data at the state, regional and local levels.**

Current national surveillance permits tracking of asthma prevalence, asthma physician office visits, asthma emergency room visits, asthma hospitalizations and asthma mortality at a national level and in four geographic regions (i.e., Northeast, Midwest, South, and West) through surveys conducted by the National Center for Health Statistics. Surveillance information on asthma, with the exception of mortality data, are not available at the state or local level. This information is needed to identify high risk populations and environmental risk factors of relevance to particular communities and to design and implement interventions that will be most suitable for, and therefore most likely to succeed, in that community. State and local health agencies also need this information to evaluate the impact of local sources of air pollution on childhood asthma in specific communities. A significantly enhanced and expanded surveillance program will be essential to study issues related to race and gender differences in asthma morbidity and mortality among children, identify gaps in providing comprehensive care, and monitor trends in asthma morbidity and mortality at the community level.

#### KEY ACTIONS:

CDC, in collaboration with NIH, will work with state and local health departments to build a national asthma surveillance system. The first priority in this work will be to develop the state and local infrastructure that will be needed to collect, analyze, and interpret data at the local level. The surveillance system will consist of the following components:

- ▶ Annual surveys of states and major metropolitan areas using standard instruments and methods to define the prevalence of asthma, to characterize the severity of asthma and the quality of life for persons with asthma, and to assess the quality of asthma management.
- ▶ Systematic, periodic examinations of existing mortality and morbidity data at state/city or county level to determine deaths, hospitalizations, and emergency room visits for asthma.

- ▶ Expanded capability to integrate analysis of ambient air monitoring data with asthma morbidity and mortality data.
- ▶ Modify existing data collection systems as needed, to ensure the ability to measure progress toward the Healthy People 2010 goals, now under development.
- ▶ Follow-up studies of geographic and population groups with elevated asthma prevalence rates and elevated rates of morbidity.

#### 4. DISPROPORTIONATE IMPACTS ON THE POOR AND MINORITIES

Identify the reasons for and eliminate the disproportionate burden of asthma among different racial and ethnic groups and those living in poverty.

Poor and minority children are disproportionately affected by asthma, which has reached epidemic proportions in many American inner cities. Prevalence rates vary only by a few percentage points among different race and ethnic groups, yet emergency room use, hospitalization, and mortality rates vary 3- to 4-fold. Understanding the factors that contribute to the disproportionate impact of asthma on minority and lower income populations is the critical first step to reducing and eventually eliminating the disparities between rich and poor, minority and non-minority children. Such factors may include differing intensities of environmental exposures, such as exposure to cockroach antigen and access to and quality of care, among others.

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Poor and minority children are disproportionately affected by asthma, which has reached epidemic proportions in many American inner cities.

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##### A. CONDUCT RESEARCH AND SURVEILLANCE ACTIVITIES TO IMPROVE UNDERSTANDING OF THE PROBLEM

CDC, NIH and ATSDR will conduct research and collect surveillance data to better define factors contributing to asthma morbidity and asthma prevalence in minority and lower socioeconomic populations. Such data will:

- ▶ Separate roles of geography and environmental factors from ethnicity and socio-cultural variables in assessing their contribution to asthma prevalence.
- ▶ Examine the differences in asthma prevalence in Hispanics of different origins in order to

provide some clues on risk factors contributing to higher rates of asthma.

- Examine the influence of poverty versus racial and ethnic group on use of emergency room services and hospitalization rates.

## **B. IMPLEMENT PROGRAMS TO ELIMINATE THE DISPROPORTIONATE IMPACT OF ASTHMA IN MINORITY POPULATIONS AND THOSE LIVING IN POVERTY.**

### **KEY ACTIONS:**

NIH, EPA, and CDC will implement public health interventions directed specifically to relieve the impact of asthma on vulnerable populations, particularly targeting the environmental exposures of vulnerable populations

- Ensure a substantial and appropriate focus of public health asthma initiatives on vulnerable populations.
- Make culturally and linguistically appropriate information on asthma widely available.
- Expand the availability of services, particularly emphasizing the need to modify the environment to reduce exposure to known asthma triggers, to the under-served in lower socioeconomic communities.

EPA will collaborate with state environmental protection programs to establish targeted compliance monitoring and enforcement efforts in communities with higher than average childhood asthma morbidity and mortality rates.

## GLOSSARY

**Acute:** Brief (days to weeks).

**Allergen:** A chemical or biological substance (e.g. pollen, animal dander, or house dust mite proteins) that causes an allergic reaction, characterized by hypersensitivity.

**Asthma:** A chronic lung disease with chronic inflammation of the airways and recurring exacerbations of airflow limitation that result in wheezing, cough, chest tightness, and difficulty breathing.

**Atopy:** The genetically inherited susceptibility to become allergic.

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

**Exacerbate:** To aggravate or make asthma worse.

**Genome:** The inherited genetic composition of an organism.

**Incidence:** The number of individuals that develop an abnormality within a given time (usually a year) expressed as a percentage of the population.

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

**Primary Prevention:** Interventions designed to prevent the development of asthma.

**Prevalence:** The percentage of the population with a disease, disorder, or abnormality.

**Secondary Prevention:** Interventions designed to prevent the worsening of asthma among individuals who already have the disease.

**Surveillance:** The ongoing collection, analysis, interpretation, and dissemination of health outcome data used to plan and evaluate public health programs.

**Trigger:** An exposure that causes symptoms or exacerbations of asthma.

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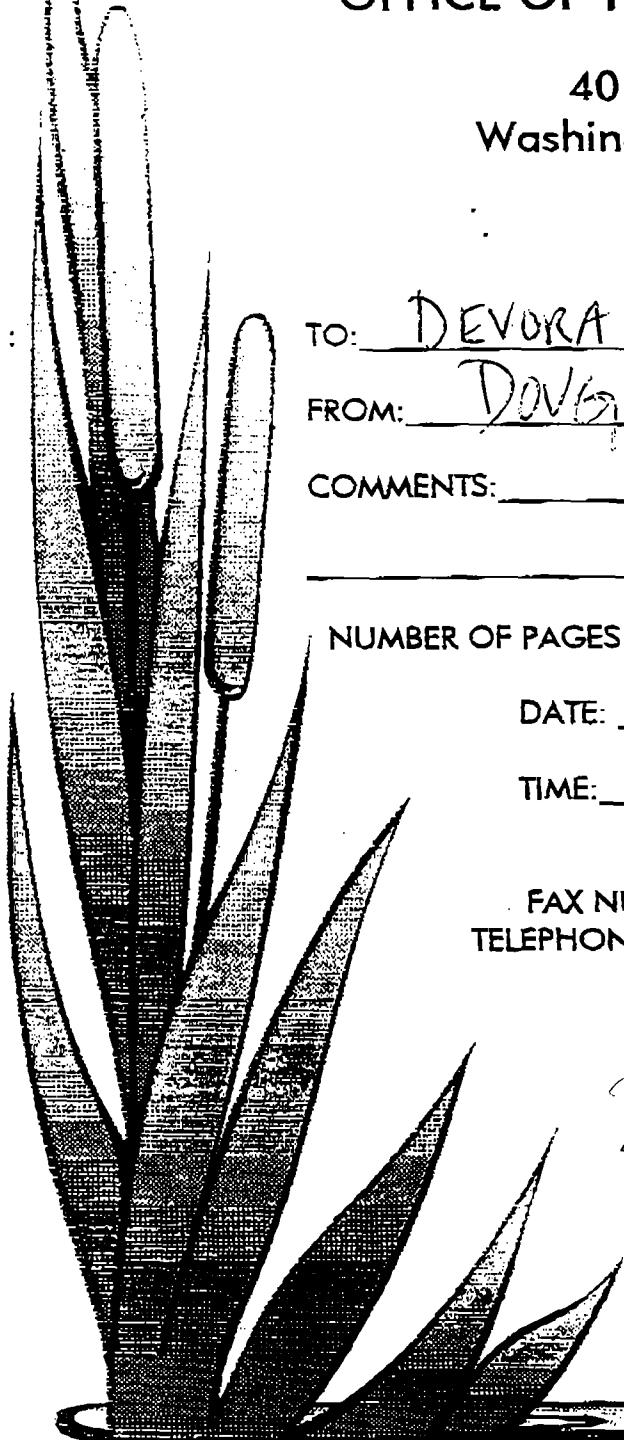
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## ABOUT THE PRESIDENT'S TASK FORCE ON ENVIRONMENTAL HEALTH RISKS AND SAFETY RISKS TO CHILDREN

In recognition of the growing body of scientific information demonstrating that America's children suffer disproportionately from environmental health risks and safety risks, President Clinton issued Executive Order 13045 on April 21, 1997, directing each Federal Agency to make it a high priority to identify, assess, and address those risks. In issuing this order, the President also created the Task Force on Environmental Health Risks and Safety Risks to Children, co-chaired by Donna Shalala, Secretary of the Department of Health and Human Services, and Carol M. Browner, Administrator of the Environmental Protection Agency. The Task Force was

charged with recommending strategies for protecting children's environmental health and safety. Two subcommittees were established in the Executive Order to carry out this directive: a subcommittee directed to review and foster public access to federal government sponsored research on environmental health and safety risks to children, and a subcommittee directed to identify priority public outreach activities related to protecting children's environmental health and safety.



In April 1998, the Task Force identified four priority areas for immediate attention: childhood asthma, unintentional injuries, developmental disorders, and childhood cancer. The Task Force created and charged the Asthma Priority Area Workgroup with reviewing current Federal efforts to address the many facets of the issue and, most importantly, to make appropriate recommendations for action by the Federal government. This report is the result of that effort.

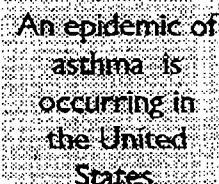
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## EXECUTIVE SUMMARY

An epidemic of asthma is occurring in the United States. While the epidemic affects people of all ages, children are particularly affected. Nearly 1 in 13 school-aged children has asthma, and the percentage of children with asthma (i.e., prevalence rate) is rising more rapidly in preschool-aged children than in any other age group.

There is no national system to collect data from states specifically on asthma, although several states are developing systems to collect such data. Although national data do not provide the resolution necessary to identify particular geographic areas hardest hit by the asthma epidemic, surveys undertaken in a number of large cities in the United States indicate that the prevalence and severity of asthma are greatest in the large, urban inner cities.



An epidemic of asthma is occurring in the United States.

Asthma is one of the leading causes of school absenteeism, accounting for over 10 million missed school days per year. Asthma also accounts for many nights of interrupted sleep, limitation of activity, and disruptions of family and care-giver routines. Asthma symptoms that are not severe enough to require a visit to an emergency room or to a physician can still be severe enough to prevent a child with asthma from living a fully active life.

In 1990, the cost of asthma to the U.S. economy was estimated to be \$6.2 billion, with the majority of the expense attributed to direct medical expenses. A 1996 analysis found the cost of asthma to be \$14 billion, indicating a rapidly increasing financial burden. These estimates, which are not limited to the costs of childhood asthma, indicate that the direct medical costs of asthma account for between 1% and 3% of all health care expenditures in the United States.

Asthma is a particularly important disease to consider in the context of environmental hazards to which children are exposed. Children breathe more air, eat more food, and drink more liquid in proportion to their body weight than do adults, and their developing respiratory, immunological, and digestive systems may be more susceptible to environmental exposures than those of adults. In a typical day, children may be exposed to a wide array of environmental agents at home, in day care centers, schools and while playing outdoors. There is substantial evidence that environmental exposures, including viruses and allergens, play a major role in triggering asthma symptoms. Airborne allergens include those from house dust mites, cockroaches, mold and animal dander. In addition, exposure to environmental tobacco smoke has been shown to be a major determinant of asthma symptoms. Elevated levels of outdoor air pollutants, particularly ozone, are associated with increased symptoms and an increased risk of emergency department visits for asthma, as well.

In addition, environmental factors such as airborne allergens and environmental tobacco smoke (i.e., secondhand smoke) may play a major role in the onset of asthma. Other pollutants may also play a role, although the scientific data are inadequate to offer firm conclusions. Genetic

predisposition is the strongest known risk factor for developing asthma, but the rapidly rising number of cases of childhood asthma cannot be solely genetic because the genetic composition of the population changes slowly. Rather, some interaction between genetic predisposition and environmental exposures, and possibly other factors such as diet or lack of exercise are likely to be responsible for the increase. Further work is essential to clarify how genetic susceptibility and environmental exposures interact to cause asthma.

Reducing exposures of children with asthma to airborne allergens and pollutants will reduce the health burden of asthma and significantly improve their quality of life. It is not yet certain, but it is possible that reducing the exposure of infants and young children at risk of developing asthma may prevent its onset. Environmental control methods and asthma treatments are available now that can help children and their families control asthma and lead healthy, active lives. Yet not all children have access to these measures. Too many children miss school, limit their physical activity, and are seriously ill because of asthma.

The environmental action plan for asthma outlined in this report is designed to promote concerted Federal action to protect all children with asthma from environmental risks that worsen their disease and to expand federal research to reveal how reducing environmental risks might prevent children from getting asthma.



## GUIDING PRINCIPLES

Federal agency actions can provide leadership and direction in reducing environmental risks to protect children from asthma. Recommendations for action put forward in this initiative are predicated on the principles that federal action must have:

- A focus on efforts to *eliminate the disproportionate impact of asthma in minority populations and those living in poverty.*
- An emphasis on *partnerships and community based programs.*
- A commitment to setting *measurable and consistent goals* for childhood asthma under the Healthy People 2010 program.
- *An investment in evaluation* to identify those strategies that are most effective in reducing the burden of asthma so that they may be replicated.

## RECOMMENDATIONS FOR ACTION

### RESEARCH

Strengthen and accelerate focused research into the environmental factors that cause or worsen childhood asthma.

- ☉ Strengthen and accelerate research into the environmental factors that may contribute to the onset of asthma in children.
- ☉ Expand and accelerate research to develop and evaluate environmental strategies that will improve the quality of life of people with asthma.

This year 2000  
initiative is  
about  
protecting  
children from  
asthma...

### PUBLIC HEALTH PROGRAMS

Implement public health programs that foster improved use of current scientific knowledge to reduce environmental exposures to prevent and reduce the severity of symptoms for those with asthma.

- ☉ Promote clinician and patient implementation of national guidelines for reducing environmental risks that worsen asthma.
- ☉ Expand support for state and local public health action.
- ☉ Reduce children's exposure to environmental tobacco smoke and other indoor triggers in their homes.
- ☉ Establish school based asthma programs in every community that help reduce or eliminate allergens and irritants and that promote student's self management of asthma and full participation in school activities.
- ☉ Continue to reduce outdoor air pollution.

### SURVEILLANCE

Establish a coordinated, integrated, and systematic nationwide asthma surveillance system for collecting and analyzing health outcome and risk factor data at the state, regional and local levels.

### DISPROPORTIONATE IMPACT ON THE POOR AND MINORITIES

Eliminate the disproportionate burden of asthma among different racial and ethnic groups and those living in poverty.

- ☉ Conduct research and surveillance activities to improve understanding of the problem.
- ☉ Implement activities to eliminate the disproportionate impact of asthma in minority populations and those living in poverty.



# INTRODUCTION

## The Growing Problem of Asthma in Children

Asthma is a chronic lung disease characterized by recurrent episodes of breathlessness, wheezing, coughing, and chest tightness; these episodes are also known as exacerbations or attacks. The severity of exacerbations can range from mild to life threatening. Both the frequency and severity of asthma symptoms can be reduced by the use of medications and by reducing exposure to the environmental triggers of asthma attacks.

For the past 15 years, an epidemic of asthma has occurred in the United States. By all indications, this epidemic is continuing. Although asthma has become a major public health problem affecting Americans of all ages, races and ethnic groups, children have been particularly severely affected.



National survey data -- the responses of randomly selected U.S. residents being asked whether they had symptoms of physician diagnosed asthma in the previous 12 months -- indicate that the number of children with asthma in the United States has more than doubled in the past 15 years. In 1980, 2.3 million American children had asthma. In 1995, the most recent year for which data are available, the number of affected children had risen to 5.5 million. Based on these trends, it is estimated that in 1998 more than 6 million children in the United States have asthma. Prevalence rates of asthma are highest in boys and are increasing in both boys and girls, and in all race and ethnic groups. The prevalence of asthma in children under age 18 is 7.3%. The most rapid increase has occurred in children under 5 years old, with rates increasing over 160% over the past 15 years.

The number of deaths attributed to asthma in children has also increased. In 1977, 84 deaths in children 18 and younger were recorded; the number of deaths has risen to 280 in 1995, a more than 3-fold increase. Although the death rate due to asthma has increased in all racial and ethnic groups, minority populations experience a disproportionately higher death rate from asthma. In 1995, the death rate from asthma in African-American children, 11.5 per million, was over four times the rate in white Americans, 2.6 per million. The higher death rates among African-American children are especially troubling.

The number of hospitalizations and emergency room visits for asthma have increased in all population groups. Asthma accounts for one-third of all pediatric emergency room visits and is the fourth most common cause for physician office visits. The variation in the impact of asthma across racial and ethnic groups is significant. African American children have an annual rate of hospitalization of 74 per 10,000, over 3 times that for whites, 21 per 10,000. In addition, African American children are approximately 4 times more likely than white children to seek care at an emergency room. In short, African-American children have a slightly higher risk of getting asthma, but have a much higher risk of hospitalization or death due to the disease.

At the present time, surveillance for asthma in children is limited to analyses of ongoing surveys and data systems on health events such as mortality, hospitalization, and outpatient visits. Other than for African Americans, such information is extremely limited for most ethnic groups. There is no national system to collect data from states specifically on asthma, although several states are developing systems to collect such data. Although national data do not provide the resolution necessary to identify particular geographic areas hardest hit by the asthma epidemic, surveys undertaken in a number of large cities in the United States indicate that the prevalence and severity of asthma are greatest in the large, urban inner cities.

There is no national system to collect data from states specifically on asthma, although several states are developing systems to collect such data.

These measures, particularly for death, hospitalization, and emergency room visits, give an incomplete picture of the true burden of asthma in the United States. For example, one follow-up study of children with asthma in inner city areas found a nearly 10 times higher likelihood of a child suffering symptoms of asthma on a given day than visiting an emergency room. Asthma is one of the leading causes of school absenteeism, accounting for over 10 million missed school days per year. Asthma also accounts for many nights of interrupted sleep, limitation of activity, and disruptions of family and care-giver routines. Asthma symptoms that are not severe enough to require a visit to an emergency room or to a physician can still be severe enough to prevent a child with asthma from living a fully active life.

Estimating the costs of asthma is an indirect way to measure its health burden. In 1990, the cost of asthma to the U.S. economy was estimated to be \$6.2 billion, with the majority of the expense attributed to direct medical expenses. A 1996 analysis found the cost of asthma to be \$14 billion, indicating a rapidly increasing financial burden. These estimates indicate that the direct medical costs of asthma for all ages account for between 1% and 3% of all health care expenditures in the United States.

### What We Know About Childhood Asthma

Over the past 15 years, there have been major advances in the scientific understanding of asthma. Asthma is now known to be a disease of airway inflammation resulting from a complex interplay between environmental exposures and genetic and other factors. This has implications for the medical treatment and for the environmental management of asthma.

In contrast to the limited understanding of the relationship of environmental exposures to the onset of asthma, the environmental triggers of asthma attacks for children with asthma have become increasingly well characterized. House dust mites, cockroaches, mold and animal dander have been identified as the principal allergens that trigger asthma symptoms. Reducing exposure to these allergens has been shown not only to reduce asthma symptoms and the need for medication, but also to improve lung function. Environmental tobacco smoke (also called secondhand smoke) is an important irritant that can trigger an asthma episode and possibly potentiate the effects of allergens. Upper respiratory viral infections are also recognized as

important triggers for asthma episodes.

Children with asthma have long been recognized as particularly sensitive to outdoor air pollution. Many common air pollutants, such as ozone, sulfur dioxide, and particulate matter are respiratory irritants and can exacerbate asthma. Air pollution also might act synergistically with other environmental factors to worsen asthma. For example, some evidence suggests that exposure to ozone can enhance a person's responsiveness to inhaled allergens. Whether long term exposure to these pollutants can actually contribute to the development of asthma is not known, though scientists do not believe that outdoor air pollution is a major contributor to the current epidemic. To date, little research has examined the role of other air pollutants in the development or exacerbation of asthma, although this is an issue of increasing public concern.

Children with asthma have long been recognized as particularly sensitive to outdoor air pollution.

In addition to improved understanding of appropriate environmental management of asthma, the medical management of asthma has changed significantly. Inhaled anti-inflammatory medications have become the mainstay of medical management to prevent asthma episodes and lessen chronic symptoms of asthma. In addition, improvements in monitoring techniques now permit objective measures of lung function that are easy for patients and physicians to use in assessing asthma severity and monitoring changes in the disease. In a disease like asthma that varies considerably over time and where changes in lung function can occur before symptoms develop, these objective measures are essential tools for making management decisions.

As a result of these advances, the medical and environmental management of asthma is better defined and the knowledge exists to manage asthma better than ever before. One especially important finding is that patient education has been documented to be cost effective. Teaching patients and their families specific management skills improves asthma management, reduces the use of emergency services, and improves quality of life. This is particularly important for asthma management, since the environmental management of asthma requires knowledge of asthma triggers and specific actions that can be undertaken to reduce exposure to these triggers. The treatment goal for almost all individuals with asthma should be for that person to lead a life unrestricted because of asthma.

Reducing exposure to environmental allergens and pollutants will reduce the frequency and severity of attacks for children with asthma, reduce their need for medicine, and improve their lung function. Children are exposed to many environmental agents that could trigger asthma attacks. For example, 25% of children in America live in areas that regularly exceed EPA limits for ozone. Approximately 38% of children are exposed to environmental tobacco smoke in the home on a regular basis and exposure to environmental tobacco smoke is so widespread that approximately 88% of all children have some level of documented exposure. A high proportion of children living in the inner city are exposed to high levels of cockroach antigen.

## Why Has Asthma Reached Epidemic Proportions in Children?

The causes of the increasing rate of asthma over the past 15 years and the particular role that environmental exposures play are not known, but there are some clues. Atopy, the genetically inherited susceptibility to become allergic, is the most important predictor of a child developing asthma. A substantial research effort is underway to identify the genes that are responsible for susceptibility to asthma. Because the genetic make-up of the population changes slowly, genetic susceptibility alone cannot be responsible for the epidemic of asthma that has occurred in the United States over the past 15 years. Further work is essential to clarify how genetic susceptibility and environmental exposures interact to cause asthma. Factors such as the intensity of environmental exposure and the age of the person being exposed are likely to be important.

Exposure to allergens found indoors is a strong risk factor for developing asthma. Children are spending increasing amounts of time indoors, thus increasing their exposure to indoor allergens.

The environmental exposures most strongly suspected of causing asthma to develop include environmental tobacco smoke and allergens such as house dust mites, cockroaches, mold, and animal dander. Exposures that stimulate the immune system may also be significant, such as diet during the prenatal period and early infancy, the pattern of respiratory infections early in life, and even decreasing rates of exercise have all been suggested as risk factors for the development of asthma. In the broadest sense, many environmental exposures are suspected of contributing to the epidemic of asthma in children.

## Scope of the Plan for Environmental Action to Protect Children With Asthma

This action plan is about protecting children from asthma and the consequences of asthma. To accomplish this goal, the environmental aspects of asthma must be considered in the context of other aspects of asthma prevention and management, such as early access to quality medical care and efforts to understand the disproportionate health impact of asthma among minority populations. Childhood asthma is a multi-factorial disease, and efforts to improve its management and to prevent it will require multi-dimensional, multi-disciplinary efforts that must occur simultaneously. This action plan focuses on improving the environment in which children with asthma live, learn, play and work so that they can live productive, active lives and so that future generations of children might be spared the disease altogether.

## GOALS OF THE CHILDREN'S ENVIRONMENTAL HEALTH ASTHMA ACTION PLAN

BY THE YEAR 2005, THE NUMBER OF HOUSEHOLDS IN WHICH CHILDREN ARE REGULARLY EXPOSED TO SECONDHAND SMOKE WILL BE REDUCED TO 15%.<sup>1</sup>

BY THE YEAR 2010, ASTHMA HOSPITALIZATION RATES IN CHILDREN WILL HAVE FALLEN TO NO MORE THAN 10 HOSPITALIZATIONS PER 10,000 PEOPLE.<sup>2</sup> (HP 2010 DRAFT)

BY THE YEAR 2010, EMERGENCY DEPARTMENT VISITS WILL BE REDUCED TO NO MORE THAN 46 PER 10,000 PEOPLE.<sup>3</sup> (HP 2010 DRAFT)

BY THE YEAR 2010, NO MORE THAN 10% OF PEOPLE WITH ASTHMA WILL EXPERIENCE ACTIVITY LIMITATIONS.<sup>4</sup> (HP 2010 DRAFT)

1 Baseline: 29% in 1994. Source: Biennial Radon and ETS Survey of the Conference of Radiation Control Program Directors and EPA.

2 Baseline: Hospitalization rate per 10,000 population in 1993-94: 18 for total population; 50 for children 0-4 yrs of age and 18 for children 5-14 yrs. Source: HP2010 Draft

3 Baseline: Emergency room visits 71 per 10,000 population for total population in 1992-94; 121 for children 0-4 yrs of age and 81 for children 5-14 yrs. Source: HP2010 Draft

4 Baseline: Activity limitation for persons with asthma 22 percent for overall population in 1992-94. No children-specific data available. Source: HP2010 Draft

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## VISION FOR THE 21<sup>ST</sup> CENTURY

Every child in America will live,  
learn, work, and play in  
environments that do not cause or  
worsen asthma.

Asthma will no longer inhibit  
children from leading full and active  
lives.

More cost-effective medical and  
environmental asthma prevention  
and management tools will enhance  
the lives of children and their  
families.

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## GUIDING PRINCIPLES

Federal agency actions can provide leadership and direction in reducing environmental risks to protect children from asthma. Recommendations for action put forward in this plan are predicated on the principles that federal action must have:

1. A focus on efforts to better understand and eliminate the disproportionate impact of asthma in minority populations and those living in poverty.

The health burden of asthma is not shared equally throughout the U.S. population. Although the rising prevalence of asthma has affected all populations, poor and minority children are much more likely than white, non-Hispanic children to visit an emergency room, to be hospitalized, or to die from asthma. The reasons for this inequity are not known, although environmental exposures and limited access to quality medical care may all play a role.

The focus on eliminating disparities across racial and ethnic groups has to be considered in all efforts to prevent asthma and its health impact; however, because of the importance of this issue the committee has included a specific recommendation in this action plan to examine, understand, and ultimately eliminate disparities.

2. An emphasis on partnerships and community based programs.

A successful effort to reduce childhood asthma will depend in part on the level of success achieved in enlisting all sectors of society in efforts to implement effective programs to prevent and manage the disease. Federal agencies have already forged effective partnerships with many health and professional organizations, corporations, and foundations to conduct training, educate health care providers and the public, and to implement a wide range of prevention activities at the national, state, and local levels.

Expanded partnerships both within government and between government and the private sector are needed. With increasing knowledge about the primary causes of asthma and triggers of asthma attacks, the challenge for the 21<sup>st</sup> century will be to learn to integrate successfully these findings into more effective environmental, medical and educational programs.

Partnerships will be critical to implementing this broad vision of asthma control. In particular, community-based programs should integrate asthma control activities into existing systems such as schools, child care, youth programs, workplaces, primary health, correctional facilities, and job training programs.

The challenge for the 21<sup>st</sup> century will be to learn to integrate successfully these findings into more effective environmental, medical and educational programs.

### 3. A commitment to setting measurable and consistent goals for childhood asthma under the Healthy People 2010 program.

Health objectives are now being developed for the year 2010 and represent a significant revision of the goals set for the year 2000. These objectives will set the nation's health agenda for increasing years of healthy life and reducing disparities among the entire American population. Draft objectives currently encompass an expanded set of asthma-related objectives as well as a series of environmental objectives addressing known asthma triggers such as indoor allergens, secondhand smoke and outdoor air pollution.

The goals embodied in the final Healthy People 2010 document will serve as the tools to measure progress towards control of asthma. Although some of the goals are likely to measure aspects of asthma clinical management that will not be directly affected by this action plan, the primary objectives of morbidity reduction and reducing exposures to environmental hazards will be addressed.

### 4. Investment in evaluation of programs to identify those strategies that are most effective in reducing the burden of asthma so that they may be replicated.

Asthma intervention programs and related activities need to be fully evaluated to determine those techniques which are successful and should be replicated. Evaluation should be incorporated in the planning and should include:

- identification of desired health outcomes of the program;
- measurement of effectiveness of the intervention activities and processes used to implement them;
- identification of unforeseen obstacles;
- assessment of the cost-effectiveness of the program;
- a prediction of long term sustainability of the program.

# RECOMMENDATIONS FOR ACTION

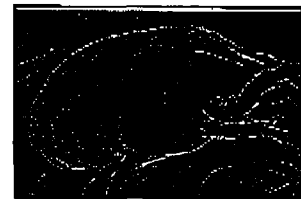
## I. RESEARCH

Strengthen and accelerate focused research into the environmental factors that cause or worsen childhood asthma.

### A. EXPAND RESEARCH INTO THE ENVIRONMENTAL FACTORS THAT CONTRIBUTE TO THE ONSET OF ASTHMA IN CHILDREN.

Though progress has been made in understanding what causes asthma, there is currently insufficient scientific information to establish specific guidelines and recommendations for public health practices to prevent the onset of asthma in children (i.e. primary prevention).

In order to establish primary prevention guidelines, the top priority for research is to determine the causes of asthma in children and particularly the role of the environment. To understand what causes asthma, research must identify the basic cellular and molecular mechanisms that cause airway inflammation and sensitization and, in particular, the interaction of environmental exposures and genetic susceptibility. In addition, clinical and epidemiologic studies are needed to examine the relationship between environmental exposures and the onset of asthma.



Because of promising preliminary work on the relationship of indoor allergens and asthma onset, as well as the much greater proportion of time that children spend indoors, greater emphasis on examining the relationship of indoor exposures to the development of asthma is warranted. Exposures to high levels of allergens in the indoor environment have been shown in some studies to be associated with the subsequent development of asthma. However, few studies have examined the influence of geographic location on the role of allergens. In studies evaluating the role of indoor allergens on exacerbations of asthma, different allergens, such as those associated with cockroaches, dust mites, and mold, have been implicated in different locations. This suggests that different allergens can exacerbate asthma, and that different allergens may be capable of inducing the new onset of asthma.

In one study, avoiding exposure to dust mite and food allergens early in life was found to reduce the risk of developing asthma in the first year of life. However, this effect was not statistically significant at 2 to 4 years of age. Whether such allergen avoidance strategies are feasible and effective in reducing the development of asthma is not known.

The complex interactions between outdoor air pollutants and allergens and the development of asthma have not been adequately evaluated. Some epidemiologic studies have suggested a relationship between exposure to volatile organic compounds and prevalence rates of childhood asthma. Because adult-onset asthma is known to be associated with occupational exposures to volatile organic compounds including formaldehyde, ethylene oxide, and isocyanates, further work to assess the possible etiologic role of specific pollutants in childhood asthma is appropriate.

Exposures to high levels of allergens in the indoor environment have been shown in some studies to be associated with the subsequent development of asthma.

KEY ACTIONS:

*CENTER 2.*

NIH, CDC, and EPA will conduct and fund studies to determine the causes of asthma. Such studies should include the following:

- ▶ examine the role of genetic susceptibility to specific environmental exposures in the development of asthma;
- ▶ assess the importance of early life events, such as *in utero* viral infections, viral infections during infancy, specific antigen exposures and exposures to maternal smoking on the development of asthma;
- ▶ examine the effects of pollutants and allergens on immune responses in animal models and in preclinical studies;
- ▶ Identify the clinical characteristics of asthma associated with different genetic, physiologic, immunologic and environmental factors;
- ▶ examine the effectiveness of combinations of immune modulation to reduce IgE responses to allergen and allergen avoidance as a means to reduce the risk of developing asthma;
- ▶ examine the epidemiology of asthma in different populations to identify risk factors for the onset of asthma.

ATSDR, in partnership with state and local health departments and community groups, will investigate childhood asthma in 5-7 communities where sources of emissions from hazardous waste facilities have already been identified. These investigations will characterize any associations between hazardous materials and the burden of asthma in children.

In addition to intramural and extramural grant programs, NIH, CDC, and EPA will fund medical centers to conduct comprehensive research on environmental aspects of asthma.

The National Academy of Sciences, with support of EPA, will complete its assessment of asthma associated with indoor pollutants. These findings will be used to guide research efforts on the causes of asthma.

**B. EXPAND AND ACCELERATE RESEARCH TO DEVELOP AND EVALUATE ENVIRONMENTAL STRATEGIES THAT WILL IMPROVE THE QUALITY OF LIFE FOR CHILDREN WITH ASTHMA.**

It is well established that inhaled allergens and irritants and outdoor pollutants provoke asthma symptoms. Research is needed to identify if other environmental exposures are significant. Further, the relative importance of various exposures is not well understood. Cost effective strategies for reducing exposures are not well developed.

Patient education strategies in certain populations have profound impacts on reducing the frequency and severity of exacerbations and improving the quality of life for children. But many of these programs are not responsive to the cultural, ethnic, and economic diversity of the American population. Innovative strategies are urgently needed for reaching a wide range of children and their families, for tailoring recommendations for reducing environmental exposures to their needs, and for providing support to follow the recommendations.

**KEY ACTIONS:**

NIH and EPA will conduct studies to examine the interrelationship between indoor allergen exposures, viral infections, ambient air pollutants, and exacerbations of asthma. This research will include identifying and evaluating cost effective methods to reduce allergen exposures, as well as methods to render the immune system less susceptible to environmental exposures.

NIH, CDC and EPA will conduct studies to improve and evaluate interventions designed to teach families and patients how to minimize exposure to environmental asthma triggers.

CDC and NIH will work with state and local health departments to develop and evaluate the cost-effectiveness of model public health intervention programs.

NIH and HUD will complete the first National Allergen Survey to provide estimates of allergen exposure for the U.S. population; this survey will provide much needed information about the apparent regional differences in allergen exposures.

NIH, with support from EPA for particulate air monitoring, will continue to fund the National Cooperative Inner-City Asthma Study (NCICAS), 1996-2000, which will determine the capacity of interventions to reduce asthma morbidity among inner city children.

EPA, NIH, and CDC will fund and conduct research in collaboration with the private sector to identify home construction, maintenance and occupancy practices that will reduce children's exposure to environmental agents that trigger asthma episodes.

As part of its program on energy efficient buildings, DOE will study the relative effectiveness of energy conservation strategies and technologies on reducing exposures to allergens.

## 2. PROGRAMS TO IMPROVE PUBLIC HEALTH

Implement public health programs that improve use of scientific knowledge to prevent and reduce the severity of asthma symptoms by reducing environmental exposures.

Despite uncertainty about the causes of the increase in asthma prevalence rates, much can and should be done to prevent severe illness and death from asthma and improve the quality of life of persons with asthma. Experts convened by the National Asthma Education and Prevention Program (NAEPP) coordinated by the National Institutes of Health (NIH) have reviewed the scientific literature and produced guidelines for managing asthma. These include specific recommendations for controlling environmental factors that contribute to asthma severity.

While there is consensus that NAEPP guidelines define the best diagnosis and management practices for asthma, dissemination of the guidelines must be expanded and adoption improved. Many clinicians do not include advice about environmental control in their patient education. Among families who do receive recommendations, adherence is generally low. Asthma is highly variable, and families need help establishing priorities for environmental control measures that will be suitable for their individual child's asthma and their family circumstances. Effective public health programs can provide this education and support.



For children without access to quality health care, appropriate instruction on the environmental triggers of asthma is impossible or severely limited. Emergency rooms or urgent care facilities may serve as the only source of primary care for such children. These settings should be recruited to provide the kind of education and links to chronic disease management services that are essential to reducing the severity and frequency of asthma attacks.

### A. PROMOTE CLINICIAN AND PATIENT IMPLEMENTATION OF NATIONAL GUIDELINES FOR REDUCING ENVIRONMENTAL RISKS THAT WORSEN ASTHMA.

#### KEY ACTIONS:

NIH will use appropriate existing partnerships and innovative mechanisms to ensure wider use of the most up-to-date Guidelines for the Diagnosis and Management of Asthma published and periodically updated by the NAEPP/NIH. These guidelines offer specific advice on the environmental management of asthma.

Encourage and assist health care practitioners, including doctors, nurses, and personnel in emergency rooms and urgent care facilities, to provide high quality patient education on reducing exposure to pollutants that trigger asthma.

NIH, CDC, and EPA will establish partnerships with managed care organizations to integrate strong messages about management of asthma into existing health education programs, emphasizing the environmental management of asthma.

HCFA will investigate ways to improve the management of asthma, following the NAEPP guidelines, in care provided to Medicaid beneficiaries under 18 years old in the Managed Care Program.

ATSDR will expand to ten the number of pediatric environmental health specialty units across the country. These specialty units will develop environmental medicine materials, health education activities, and risk communication strategies on issues related to asthma and the environment well as other environmental health hazards to children; these educational activities will target both primary care providers and persons potentially exposed to harmful pollutants. In addition, these specialty units will provide consultation services to primary care as well as clinical diagnostic services to patients upon referral.

## **B. EXPAND SUPPORT FOR STATE AND LOCAL PUBLIC HEALTH ACTION.**

Recent advances in the treatment of asthma and in identifying the environmental triggers of asthma attacks make it possible to control and prevent symptoms at a level unheard of just ten years ago. But these gains have not been realized by many of our children. Public health agencies have a critical role in helping to reduce environmental factors affecting asthma and the human and financial toll of the disease. These programs should include the following components:

- (1) Education and training
- (2) Asthma surveillance
- (3) Coalitions for prevention

### **KEY ACTION:**

CDC, in collaboration with NIH, will provide grants to 12 state health departments in FY 2000 to ensure that effective asthma education, prevention, and public health outreach activities in local communities are developed and sustained.

### C. REDUCE CHILDREN'S EXPOSURE TO ENVIRONMENTAL TOBACCO SMOKE AND OTHER INDOOR TRIGGERS IN THEIR HOMES.

Secondhand tobacco smoke and indoor allergens are major contributors to the incidence of wheezing in young children and play a significant role in the number and severity of asthma attacks. Reducing smoking in homes with young children will improve the health status of the estimated 2 million children with asthma who are exposed to secondhand smoke. In addition, exposure to allergens such as cockroach, house dust mite, mold, and animal dander causes many attacks of asthma that are preventable.



#### KEY ACTIONS:

EPA, CDC, and NIH will conduct a national public information campaign to reduce children's exposure to environmental tobacco smoke.

EPA, HUD, and CDC will work within existing public health programs that visit homes to increase the avenues through which parents and children receive key messages about asthma prevention and management. For example, partnerships with the extensive lead paint home intervention network, the AmeriCorps volunteers program, VISTA volunteer program, U.S. Department of Agriculture Extension Service, and the "Welfare to Work" program could all be used to bring asthma prevention messages (e.g., smoking and controlling allergens through techniques such as Integrated Pest Management) directly into millions of homes in a cost-effective manner.

Exposure to secondhand smoke and allergens such as cockroach, house dust mite, mold, and animal dander causes many attacks of asthma that are preventable.

EPA and DHHS, under the coordination of the National Asthma Education and Prevention Program and in close cooperation with the private sector, will undertake a national asthma awareness campaign, targeted at parents and emphasizing avoidable asthma triggers such as environmental tobacco smoke, indoor allergens, and outdoor air pollution episodes as well as early diagnosis and effective management.

HUD will collaborate with health departments with authority over low-income housing, home health educators, and building operators to implement appropriate guidance on building operation and maintenance practices, including ventilation, moisture control and integrated pest management techniques.

EPA will develop innovative means to disseminate information to persons and families with asthma on the health impact of ambient air pollutants, particularly ozone and particulate matter.

## D. ESTABLISH SCHOOL BASED ASTHMA PROGRAMS IN EVERY COMMUNITY.

The educational system is a critical component of effective efforts to reduce illness due to asthma in children. Programs need to be implemented at the local school level to assure a healthy physical environment at the school and to promote improved self-management of asthma through education.

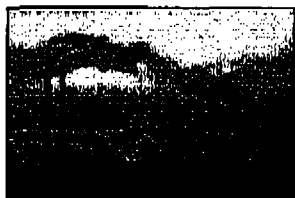
### KEY ACTIONS:

Develop and expand partnerships between EPA, NIH, CDC, the Department of Education, and non-governmental public and private organizations to implement programs to assure that the school environment is safe for children with asthma. Such efforts should include expanding programs such as the Indoor Air Quality Tools for Schools Program.

EPA and NIH will collaborate with private and voluntary organizations to expand their successful school-based asthma management programs.

## E. CONTINUE TO REDUCE OUTDOOR AIR POLLUTION

The U.S. EPA set national ambient air quality standards (NAAQS) for six air pollutants in 1971, in part based on evidence of associations between air pollutants such as ozone, particulate matter, and sulfur dioxide and asthma. Since that time substantial new epidemiological evidence has



been published supporting the association between levels of ozone and particulate matter and increased hospitalization for respiratory causes, such as childhood asthma. In 1997, NAAQS for both ozone and particulate matter were strengthened to improve the protection afforded by these standards and to help reduce the risk of ambient exposures that aggravate asthma in children.

Federal, State, local, and private sector efforts to implement the original NAAQS resulted in substantial improvements in air quality, yet notable problems remain. Following the 1990 Clean Air Act Amendments, efforts were expanded to improve nationwide air quality and reduce related health effects. In conjunction with the strengthening of the ozone and particulate matter NAAQS, EPA has taken steps to integrate implementation measures for these pollutants and to improve the effectiveness of control programs. EPA has also taken steps to inform the public about air pollution that may affect children.

### KEY ACTIONS:

EPA has proposed that twenty-two States revise their implementations programs in order to provide widespread regional reductions in ozone and related pollutants.

Revisions will be made to strengthen the Pollutant Standards Index (PSI) to help make the public more

aware of days when air pollution levels could affect health and to alert individuals to steps which could be taken to mitigate health effects associated with exposure to air pollution.

The Environmental Monitoring for Public Access and Community Tracking (EMPACT) program will increase the availability of real time ozone data over the Internet and through local TV weather broadcasts.

### 3. SURVEILLANCE

**Establish a coordinated nationwide asthma surveillance system for collecting and analyzing health outcome and risk factor data at the state, regional and local levels.**

Current national surveillance permits tracking of asthma prevalence, asthma physician office visits, asthma emergency room visits, asthma hospitalizations and asthma mortality at a national level and in four geographic regions (i.e., Northeast, Midwest, South, and West) through surveys conducted by the National Center for Health Statistics. Surveillance information on asthma, with the exception of mortality data, are not available at the state or local level. This information is needed to identify high risk populations and environmental risk factors of relevance to particular communities and to design and implement interventions that will be most suitable for, and therefore most likely to succeed, in that community. State and local health agencies also need this information to evaluate the impact of local sources of air pollution on childhood asthma in specific communities. A significantly enhanced and expanded surveillance program will be essential to study issues related to race and gender differences in asthma morbidity and mortality among children, identify gaps in providing comprehensive care, and monitor trends in asthma morbidity and mortality at the community level.

#### KEY ACTIONS:

CDC, in collaboration with NIH, will work with state and local health departments to build a national asthma surveillance system. The first priority in this work will be to develop the state and local infrastructure that will be needed to collect, analyze, and interpret data at the local level. The surveillance system will consist of the following components:

- ▶ Annual surveys of states and major metropolitan areas using standard instruments and methods to define the prevalence of asthma, to characterize the severity of asthma and the quality of life for persons with asthma, and to assess the quality of asthma management
- ▶ Systematic, periodic examinations of existing mortality and morbidity data at state/city or county level to determine: deaths, hospitalizations, and emergency room visits for asthma.

- ▶ Expanded capability to integrate analysis of ambient air monitoring data with asthma morbidity and mortality data.
- ▶ Modify existing data collection systems as needed, to ensure the ability to measure progress toward the Healthy People 2010 goals, now under development.
- ▶ Follow-up studies of geographic and population groups with elevated asthma prevalence rates and elevated rates of morbidity.

#### 4. DISPROPORTIONATE IMPACTS ON THE POOR AND MINORITIES

Identify the reasons for and eliminate the disproportionate burden of asthma among different racial and ethnic groups and those living in poverty.

Poor and minority children are disproportionately affected by asthma, which has reached epidemic proportions in many American inner cities. Prevalence rates vary only by a few percentage points among different race and ethnic groups, yet emergency room use, hospitalization, and mortality rates vary 3- to 4-fold. Understanding the factors that contribute to the disproportionate impact of asthma on minority and lower income populations is the critical first step to reducing and eventually eliminating the disparities between rich and poor, minority and non-minority children. Such factors may include differing intensities of environmental exposures, such as exposure to cockroach antigen and access to and quality of care, among others.

Poor and minority children are disproportionately affected by asthma, which has reached epidemic proportions in many American inner cities.

##### A. CONDUCT RESEARCH AND SURVEILLANCE ACTIVITIES TO IMPROVE UNDERSTANDING OF THE PROBLEM

CDC, NIH and ATSDR will conduct research and collect surveillance data to better define factors contributing to asthma morbidity and asthma prevalence in minority and lower socioeconomic populations. Such data will:

- ▶ Separate roles of geography and environmental factors from ethnicity and socio-cultural variables in assessing their contribution to asthma prevalence.
- ▶ Examine the differences in asthma prevalence in Hispanics of different origins in order to

provide some clues on risk factors contributing to higher rates of asthma.

- Examine the influence of poverty versus racial and ethnic group on use of emergency room services and hospitalization rates.

## **B. IMPLEMENT PROGRAMS TO ELIMINATE THE DISPROPORTIONATE IMPACT OF ASTHMA IN MINORITY POPULATIONS AND THOSE LIVING IN POVERTY.**

### **KEY ACTIONS:**

NIH, EPA, and CDC will implement public health interventions directed specifically to relieve the impact of asthma on vulnerable populations, particularly targeting the environmental exposures of vulnerable populations

- Ensure a substantial and appropriate focus of public health asthma initiatives on vulnerable populations.
- Make culturally and linguistically appropriate information on asthma widely available.
- Expand the availability of services, particularly emphasizing the need to modify the environment to reduce exposure to known asthma triggers, to the under-served in lower socioeconomic communities.

EPA will collaborate with state environmental protection programs to establish targeted compliance monitoring and enforcement efforts in communities with higher than average childhood asthma morbidity and mortality rates.

# GLOSSARY

**Acute:** Brief (days to weeks).

**Allergen:** A chemical or biological substance (e.g. pollen, animal dander, or house dust mite proteins) that causes an allergic reaction, characterized by hypersensitivity.

**Asthma:** A chronic lung disease with chronic inflammation of the airways and recurring exacerbations of airflow limitation that result in wheezing, cough, chest tightness, and difficulty breathing.

**Atopy:** The genetically inherited susceptibility to become allergic.

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

**Exacerbate:** To aggravate or make asthma worse.

**Genome:** The inherited genetic composition of an organism.

**Incidence:** The number of individuals that develop an abnormality within a given time (usually a year) expressed as a percentage of the population.

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

**Primary Prevention:** Interventions designed to prevent the development of asthma.

**Prevalence:** The percentage of the population with a disease, disorder, or abnormality.

**Secondary Prevention:** Interventions designed to prevent the worsening of asthma among individuals who already have the disease.

**Surveillance:** The ongoing collection, analysis, interpretation, and dissemination of health outcome data used to plan and evaluate public health programs.

**Trigger:** An exposure that causes symptoms or exacerbations of asthma.

## ADDITIONAL READING

### Technical

National Heart, Lung, and Blood Institute, National Asthma Education and Prevention Program. *Expert Panel Report 2: Guidelines for the Diagnosis and Management of Asthma*. National Institutes of Health pub no 97-4051. Bethesda, MD, 1997.

Mannino DM, Homa DM, Pertowski CA, et al., *Surveillance for Asthma, United States, 1960-1995*. MMWR 1998;47(No. SS-1):1-27.

Institute of Medicine. *Indoor Allergens. Assessing and Controlling Adverse Health Effects*. National Academy Press. Washington, D.C. 1993

### Families

American Lung Association. *Family Guide to Asthma and Allergies. How You and Your Children Can Breathe Easier*. Little, Brown and Company. New York. 1997

National Heart, Lung, and Blood Institute, National Asthma Education and Prevention Program. *Asthma, Physical Activity and School*. National Institutes of Health pub no 95-3651. Bethesda, MD, 1995.

National Heart, Lung, and Blood Institute, National Asthma Education and Prevention Program. *Facts About Controlling Your Asthma*. National Institutes of Health pub no 97-2339. Bethesda, MD, 1997.

National Heart, Lung, and Blood Institute. Global Initiative for Asthma. *What You and Your Family Can Do About Asthma*. National Institutes of Health pub no 96-3659C. Bethesda, MD, 1996.

### Indoor Air Pollution

EPA's *Indoor Air Quality Tools for Schools*. Available from:  
Indoor Air Quality Information Clearinghouse: 1-800-438-4318  
Indoor Air Quality Web Site: [www.epa.gov/iaq/](http://www.epa.gov/iaq/)