

10-EH-01

Committee: Environmental/Occupational

Title: Asthma: a continuing public health priority

I. Statement of the Problem:

Asthma is a common and costly chronic inflammatory disorder of the airways affecting approximately 34 million Americans (11.5%) at some time in their lives. Between 1980 and 1995, 12-month asthma prevalence increased from 6.8 million to 14.8 million (Moorman et al., 2007). Since 2001, current prevalence has increased from 20.3 million (7.3%) to 23.3 million (7.7%) [<http://www.cdc.gov/asthma/nhis/default.htm#08>]. In 2007, more than 12 million people reported an asthma attack in the previous 12 months [Moorman, personal communication]. Children under the age of 18 have higher prevalence (13.1% lifetime and 9.1% current) than adults (10.9% lifetime and 7.3% current). Children with current asthma are no longer significantly more likely to report an attack in the previous 12 months (54.8%) than are adults with current asthma (50.4%) [Moorman, personal communication]. Depending on the definition used and the study design, between 15 and 53% of adult cases of current asthma may be work-related (Balme et al. 2003, Lutzker et al. 2010, Vollmer WM et al. 2005; Sama SR et al. 2006).

While the prevalence of current asthma, increased between 2001 and 2007 (7.3% and 7.7%, respectively), the rates of asthma emergency department visits (60 and 55 per 10,000, 2001 and 2006, respectively), asthma hospitalizations (16 and 15 per 10,000, 2001 and 2006, respectively) and asthma deaths (15 and 12 per million, 2001 and 2006, respectively) have remained stable or declined slightly, indicating improved outcomes in spite of an increase in the number of people with asthma [Moorman et al., 2007; Moorman, personal communication].

The cost to society is staggering. For 2010, the estimated direct cost due to asthma is \$20.7 billion; the 1996 estimated cost for work-related asthma was \$1.6 billion [NHLBI 2009, Leigh et al 2002]. Aside from the medical costs, asthma severely impacts quality of life by limiting school and work attendance, occupation choices, physical activity and organized sports participation. In 2008, asthma resulted in 2.3 million children missing 14.4 million days of school and 2.4 million adults missing 36.2 million days of work. [Moorman, personal communication]

Research supported by NIH (National Institutes of Health) and others continues to contribute to our understanding of asthma and environmental exposures that contribute to asthma exacerbations. Clinical guidelines for the diagnosis, treatment and management of asthma have been developed by a national expert panel (NAEPP, 2007) and distributed by professional and volunteer organizations. Volunteer organizations such as the American Lung Association have implemented asthma education and awareness programs. Both Healthy People 2010 (HP2010) and Healthy People 2020 (HP2020) have goals specific to state-level surveillance of asthma (<http://www.healthypeople.gov/>). By the HP2010 midpoint review, the goal for increasing the number of states with an asthma

surveillance system to 25 had been achieved (DHHS, 2006). The HP2020 goal is to expand asthma surveillance to include all states¹. Despite these efforts, CSTE recognizes that a better coordinated public health effort will be necessary for implementing effective asthma prevention and control programs to achieve the HP2020 goals for asthma. Health departments, in conjunction with key stakeholders, must play a central role in both the implementation of strategies to reduce the occurrence and impact of asthma and also in asthma surveillance, which is needed to ascertain the impact of programs and measure progress toward asthma-related goals.

The Centers for Disease Control and Prevention (CDC) has made considerable efforts contributing to a coordinated public health program addressing asthma. The Asthma Control Program of the CDC's National Center for Environmental Health (NCEH) funds 36 state health departments for asthma control and surveillance activities. These programs have established state-wide asthma partnerships and produced state asthma strategic plans based on asthma surveillance data. In addition, NCEH has funded the *Controlling Asthma in American Cities* project from 2001 to 2008. CDC's Division of Adolescent and School Health (DASH) implements school-based asthma management programs. Explorations of effective and acceptable interventions among communities at high risk have been evaluated through the Community Guide [<http://www.thecommunityguide.org/asthma/index.html>]. CDC worked with CSTE to develop an asthma case classification algorithm [CSTE, 1998]. CDC's National Institute for Occupational Safety and Health (NIOSH) funds states to conduct sentinel surveillance for the prevention and control of work-related asthma. A surveillance case definition for work-related asthma was developed and published in 1999 (Jajosky, 1999)

The 1998 case definition (CSTE, 1998) improved the comparability of asthma surveillance data across states and over time. At the time it was developed, a review of the literature on asthma failed to identify scientific consensus on a clinical definition of asthma; although standards of care had been published. The 1998 asthma position statement included a specific surveillance case definition for asthma prevalence, morbidity and mortality. The case definition approach included several different aspects of the burden of asthma. It was specific to data collected from death certificates, hospital discharge databases, survey (self-report), and clinical and laboratory data. It provided states with a uniform set of criteria for identifying individuals with probable or possible asthma, based on clinical, laboratory or other information. That definition has promoted uniform classification of cases and events at the local, state and national level. Use of the standard asthma surveillance case definition was critical to appropriately interpret and compare asthma surveillance data among reporting jurisdictions and over time and to evaluate the impact of state asthma interventions.

Continued surveillance is needed at all geographic levels to describe the burden of asthma in the population and to target and evaluate interventions. CSTE commends CDC for past support of state-based asthma surveillance efforts. However, funding for the CDC asthma programs has remained static for many years and is not sufficient to fund all

¹ The term "state" includes the 50 states, the District of Columbia, American Samoa, the Mariana Islands, Guam, Puerto Rico and the Virgin Islands.

needed surveillance. Since 1998, the capacity for asthma surveillance has increased in both the content of the available data and the geographic specificity of asthma data. Surveillance of asthma in many states now includes assessment of exposures that can exacerbate asthma, details on medication use, measures to assess the level of asthma control, expanded use of hospitalization data and Emergency Department data, and use of Medicaid and other administrative data systems; all of which have contributed to a better understanding of asthma among demographic subpopulations. Consequently, the existing CSTE recommendations for the surveillance of asthma need to be updated and expanded to better reflect current surveillance practices and concepts and to provide comparable data for asthma prevention and control across different jurisdictions.

Asthma surveillance activities have grown in complexity and scope since the first surveillance case definition was developed in 1998. This complexity would be difficult to capture in single case definition. Another model for providing guidance to standardize surveillance activities is the development of a set of disease-specific indicators. The indicator approach has been successfully applied to surveillance of environmental issues through the State Environmental Health Indicators Collaborative (SEHIC, 2006) and Environmental Public Health Tracking (EPHT), occupational health (CSTE, 2010), and surveillance of chronic diseases (<http://apps.nccd.cdc.gov/cdi/>). For example, the Chronic Disease Indicators include 90 measures for multiple chronic conditions and include only mortality and hospitalization measures specific to asthma. The hospitalization indicator is not yet available due to non-standard state systems and incomplete data. The Environmental Public Health Tracking Indicators also include asthma indicators but these are focused on environmental public health; consequently, they vary slightly in definition from more commonly used asthma surveillance measures. While the SEHIC, EPHT, and asthma indicator efforts are complementary to each other, each serves its own purpose. Because of the limitations of existing indicators, additional asthma surveillance indicators are needed with standardized calculation directions for their production. These additional asthma indicators are intended to support state health programs by addressing indicators specific to asthma prevention and control.

The purpose of this statement is to initiate the development of a set of asthma surveillance indicators to support state and local surveillance of asthma prevention and control efforts.

II. Statement of the desired action(s) to be taken:

CSTE recommends that asthma prevention and control continue as a major public health priority at the national, state, territory, tribal, and local levels. A coordinated public health response to asthma requires a nationwide, comprehensive surveillance system which includes asthma incidence, prevalence, control, exposures that cause or exacerbate asthma, morbidity, and mortality. The purpose of this recommended comprehensive surveillance system is to have an understanding of scope, severity, treatment, and cost of the disease to support the development, targeting, implementation and evaluation of intervention strategies at state and local levels. To this end, CSTE recommends that:

- 1) CDC (NCEH, NCCDPHP, and NIOSH), in collaboration with CSTE, and other national partners, promote the development and use of a comprehensive set of standardized, priority indicators for asthma surveillance. Indicators should address prevalence, clinical management, self management, health care utilization, triggers, quality of life, mortality, and cost.
 - a. Federal agencies and national partners participate to develop an understanding of the need for asthma surveillance indicators in relation to their goals and measuring benchmarks. In addition to CDC, these constituents could include the National Heart Lung and Blood Institute (NHLBI), the United States Environmental Protection Agency (EPA), Housing and Urban Development (HUD), the National Institute of Environmental Health Science (NIEHS), the US Department of Education (USDE), the National Institute of Allergy and Infectious Diseases (NIAID), Centers for Medicaid and Medicare Services (CMS), Health Resources and Services Administration (HRSA), Occupational Safety and Health Administration (OSHA), the Office of Minority Health (OMH), Indian Health Service (IHS), and Agency for Health Care Quality and Research (AHRQ), as well as other appropriate voluntary and professional organization partners.
 - b. CSTE and state/local asthma staff develop and prioritize a set of surveillance indicators, with CDC and appropriate national partners. The indicators should identify specifics as needed for each different level of certainty (i.e., confirmed/probable/possible), and should address adult, child and work-related asthma.
- 2) CDC work with CSTE and state partners to develop data collection, analysis, and dissemination capacity for asthma indicators at state, local, and tribal levels, through funding, educational materials, and trainings.

III. Public Health Impact:

Asthma surveillance programs provide data that can be used to assess the burden of asthma, by detecting sentinel events, monitoring trends over time, and evaluating the effectiveness of asthma public health programs. The development of a standardized set of asthma surveillance indicators will improve the comparability of these data between states, increase epidemiologic capacity in states that are not already conducting asthma surveillance and will guide asthma intervention activities.

IV. References:

1. Balmes J, Becklake M, Blanc P, Henneberger P, Kreiss K, Mapp C, Milton D, Schwartz D, Toren K, Viegi G; Environmental and Occupational Health Assembly, American Thoracic Society. American Thoracic Society Statement: Occupational contribution to the burden of airway disease. Am J Respir Crit Care Med. 2003 Mar 1;167(5):787-97.
2. Council of State and Territorial Epidemiologists: Environmental and Chronic Disease Committees. Asthma Surveillance and Case Definition. CSTE POSITION STATEMENT 1998-EH/CD 1, June 1998. Available at www.cste.org.
3. Council of State and Territorial Epidemiologists: Occupational Health Surveillance Subcommittee. Occupational Health Indicators: A Guide for Tracking Occupational Health Conditions and their Determinants, May 2010. Available at www.cste.org.
4. Jajosky RA, Harrison R, Reinisch F, Flattery J, Chan J, Tumpowsky C, Davis L, Reilly MJ, Rosenman KD, Kalinowski D, Stanbury M, Schill DP, Wood J. Surveillance of Work-Related Asthma in Selected U.S. States Using Surveillance Guidelines for State Health Departments — California, Massachusetts, Michigan, and New Jersey, 1993–1995. In: CDC Surveillance Summaries, June 25, 1999. MMWR 48(No.SS-3): 1-20.
5. Leigh JP, Romano PS, Schenker MB, Kreiss K. Costs of occupational COPD and asthma. Chest. 2002 Jan;121(1):264-72.
6. Lutzker LA, Rafferty AP, Brunner WM, Walters JK, Wasilevich EA, Green MK, Rosenman KD. Prevalence of work-related asthma in Michigan, Minnesota, and Oregon. J Asthma. 2010 Mar;47(2):156-61.
7. Moorman JE, Rudd RA, Johnson CA, King M, Minor P, Bailey C, Scalia MR, Akinbami LJ, MD. Surveillance for Asthma — United States, 1980-2004. MMWR October 19, 2007; 56(SS-8):1-60.
8. Moorman JE (CDC National Center for Environmental Health's Air Pollution and Respiratory Health Branch). Personal Communication. Unpublished 2007-2008 National Health Interview Survey data, 2006 National Ambulatory Medical Care Survey, National Hospitalization Discharge Survey, and National Vital Statistics System data.
9. National Asthma Education and Prevention Program Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma. NIH Publication Number 08-5846. October 2007.
10. National Heart, Lung and Blood Institute, *Morbidity and Mortality: 2009 Chart Book on Cardiovascular, Lung, and Blood Diseases.* October 2009.

11. Sama SR, Milton DK, Hunt PR, Houseman EA, Henneberger PK, Rosiello RA. Case-by-case assessment of adult-onset asthma attributable to occupational exposures among members of a health maintenance organization. J Occup Environ Med. 2006 Apr;48(4):400-7.
12. State Environmental Health Indicators Collaborative (SEHIC). Asthma Indicators Workgroup "Lessons Learned" Summary Report. 2006. Available at <http://www.cste.org/pdffiles/2006/AboutSEHICforCSTE%205.25.pdf>
13. Vollmer WM, Heumann MA, Breen VR, Henneberger PK, O'connor EA, Villnave JM, Frazier EA, Buist AS. Incidence of work-related asthma in members of a health maintenance organization. J Occup Environ Med. 2005 Dec;47(12):1292-7.
14. U.S. Department of Health and Human Services. *Healthy People 2010 Midcourse Review*. Washington, DC: U.S. Government Printing Office, December 2006.

V. Coordination:

Agencies for Response:

- (1) Thomas Frieden, MD
Director
US Centers for Disease Control and Prevention
1600 Clifton Road, NE
Atlanta, GA 30333
404-639-7000
txf2@cdc.gov

Agencies for Information:

- (1) Diana Schmidt, M.P.H., Coordinator
National Asthma Education and Prevention Program
Division for the Application of Research Discoveries
National Heart, Lung, and Blood Institute
Building 31, Room 4A10
31 Center Drive, MSC 2480
Bethesda, MD 20892-2480
- (2) Bob Axelrad
Office of Children's Health Protection
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460.

- (3) Timothy P. Love, Director
Office of Research, Development and Information
Centers for Medicaid and Medicare Services (CMS)
7500 Security Blvd, MS C3-20-11
Baltimore Maryland 21244-1850
410-786-0948
timothy.love@cms.hhs.gov
- (4) David E. Jacobs, Ph.D.
Acting Director
Office of Healthy Homes and Lead Hazard Control
U.S. Department of Housing and Urban Development
P3202
451 7th Street, S.W.
Washington, DC 20410
- (5) J. Patrick Mastin, Ph.D.
Program Administrator
Division of Extramural Research and Training
National Institute of Environmental Health Sciences
111 T.W. Alexander Drive, MD EC-23
P.O. Box 12233
Research Triangle Park, NC 27709
- (6) Dana Carr
Program Specialist
Office of Safe and Drug Free Schools
U.S. Department of Education
400 Maryland Avenue, SW FB
Washington, DC 20202-6450US Department of Education (USDE)
- (7) Peter J. Gergen, M.D., M.P.H.
NIH/DAIT/AAIB
6610 Rockledge Drive
Room 3067
Bethesda, MD 20892-6601
National Institute of Allergy and Infectious Diseases (NIAID), NIH
- (8) Marcia K. Brand, Ph.D.
Director (Acting)
Health Resources and Services Administration (HRSA)
5600 Fishers Lane
Rockville, MD 20857

- (9) Iris R. Mabry-Hernandez, MD, MPH.
Medical Officer
Agency for Health Care Quality and Research (AHRQ)
Center for Primary Care, Prevention & Clinical Partnerships
540 Gaither Road
Rockville, MD 20850
- (10) David Michaels, PhD. MPH
Assistant Secretary of Labor
U.S. Department of Labor
Occupational Safety & Health Administration
200 Constitution Avenue
Washington, D.C.

VI. Submitting Author:

- (1) Sarah Lyon-Callo
Michigan Department of Community Health
Division of Genomics, Perinatal Health, and Chronic Disease Epidemiology
201 Townsend St., 4th Floor
PO Box 30195
Lansing, MI 48909

Co-Author:

- (1) Elizabeth Wasilevich
Michigan Department of Community Health
Division of Genomics, Perinatal Health, and Chronic Disease Epidemiology
201 Townsend Rd., 4th Floor
PO BOX 30195
Lansing, MI 48909
Phone: 517-335-8164
WasilevichE@michigan.gov
- (2) Liza Lutzker
Agency: California Department of Public Health
Environmental Health Investigations Branch, California Breathing
850 Marina Bay Parkway, P-3
Richmond, CA 94804
Phone: 510-620-3645
Fax: 510-620-3720
liza.lutzker@cdph.ca.gov

Additional Co-Authors:

- (3) Wendy Brunner
Chronic Disease & Environmental Epidemiology Section
Minnesota Department of Health
85 E. 7th Place
P.O. Box 64882
St. Paul, Minnesota 55164-0882
Phone: 651-201-5895,
wendy.brunner@state.mn.us
- (4) Asthma Position Statement Working Group:
Henry Anderson, Wisconsin DOH
Wendy Brunner, Minnesota DOH
David Callahan, CDC Air Pollution and Respiratory Health Branch
Margaret S. Filios, CDC/NIOSH
Denise Love, National Association of Health Data Organizations
Melissa Lurie, New York DOH
Liza Lutzker, California DOH
Sarah Lyon-Callo, CSTE, Michigan DOH
Dave Mannino, CDC Air Pollution and Respiratory Health Branch /University of Kentucky
Jacek Mazurek, NIOSH
Jeanne Moorman, CDC Air Pollution and Respiratory Health Branch*
Trang Nguyen, New York DOH
Pamela Rogers, Wisconsin DOH
Erin Simms, CSTE
Elizabeth Wasilevich, Michigan DOH
*Coordinator