



THE  
NORTH  
CAROLINA  
**Asthma Plan**

2013 - 2018



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## Updated story of DB....

DB now age 28, was 13-years-old when he was referred to the Pediatric Asthma Program at Vidant Medical Center. He had severe persistent asthma and had experienced 10 inpatient admissions and 19 emergency department visits prior to being referred to the program. Two of his inpatient admissions were life-threatening intensive care admissions that required mechanical ventilatory support. The Pediatric Asthma Program provided and facilitated:



- Numerous assessments at home, school and clinic visits to assist in maximizing his asthma management plan.
- Extensive asthma education for DB, his mother and his teachers.
- Environmental changes to his living environment identified as barriers to effective asthma control. One of these included obtaining an air conditioner for his bedroom by working with the Pitt County Department of Social Services and a local hardware company. This was in response to extreme heat and opening of windows being identified as asthma triggers for DB. Another environmental trigger that was addressed was an infestation of cockroaches, a known asthma trigger. By working with the housing authority, arrangements were made to have extermination services provided. Proper cleaning and storage instructions were also discussed in an effort to avoid reinfestation.
- Assistance with transportation arrangements to medical appointments.
- Establishment of a primary care physician to monitor DB's medical care.
- DB's attendance at asthma camp by obtaining financial assistance and transportation. This experience was DB's first excursion out of Pitt County.
- DB and his mother's adoption at Christmas by a local company. After familiarizing themselves with DB's history, employees of this company expressed their concern and compassion by collecting more than \$1,200 worth of foods, gifts and clothing. DB's favorite gift was an aquarium. Because of his allergies, this was his first opportunity to experience the joy of pet ownership.

By integrating all of these resources in an effort to maximize DB's management, his life changed dramatically. Since working with the Pediatric Asthma Program, his school absences decreased and he stopped using the hospital or emergency department for asthma management.

DB has since graduated from high school and is now employed full-time with a local manufacturing company. DB has learned how to manage his asthma by following his asthma action plan and contacting his primary care provider when problems arise instead of going to the local emergency department. His asthma is now classified as mild persistent and his medication use has decreased from using eight medications daily to one.

He stays active by participating in karate classes, an endeavor his asthma previously would have prevented, and has earned his black belt. His mother stated years ago, "I never used to sleep at night because I knew my son would have an asthma attack and need me. Now, we both sleep peacefully knowing that we are controlling his asthma instead of it controlling us."

DB still lives at home so he can help take care of his elderly mother. "It's now my turn to return the care that she gave to me for so many years," he said. "My mother is the reason that I am alive today."



*Thanks to Lisa Johnson, Coordinator of Pediatric Asthma Services at Vidant Medical Center, for sharing this story.*

DB's story is one of numerous such powerful and inspiring success stories in asthma management and education in North Carolina. We are proud of our approach to asthma management and of the countless individuals and organizations who are dedicated to improving the lives of those with asthma, but we realize that we have much work left to do.

The North Carolina Asthma Plan that follows provides a comprehensive blueprint for addressing asthma in the state. We will strive to ensure that those individuals with asthma in North Carolina receive the same level of care and peace of mind that DB and his mother received.



*From the Co-Chairs of the Asthma Alliance of North Carolina:*

The Asthma Alliance of North Carolina is pleased to endorse the release of the 2013 North Carolina Asthma Plan.

The Asthma Alliance of North Carolina is a statewide partnership of local and state government agencies, academic institutions, local asthma coalitions, non-profits and private industry working collaboratively to address asthma. The Asthma Alliance's mission is to reduce asthma morbidity and mortality for all people in North Carolina, in partnership with the state health department. We support a comprehensive public health approach that makes use of public and private stakeholder collaborations. We are confident that the North Carolina Asthma Plan will be invaluable to us in carrying out our mission in the coming years.

This plan is the culmination of years of effort on behalf of our statewide coalition. Our members and stakeholders have been passionately involved with the planning process. We are proud of the product, and we are proud to have our ideas, expertise, and support reflected in this important project for our state. We will continue to provide support for the state asthma plan through committees, workgroups and meetings dedicated to the review and evaluation of the plan's goals and strategies.

We sincerely thank all our members, stakeholders, and partners, who have devoted their time and resources to this plan. They have helped to make its development a great success. We look forward to accomplishing the initiatives set forth in the plan, and we look forward to an even more unified effort to reduce the burden of asthma upon the people of North Carolina.

Sincerely,

*Lisa C Johnson*

Lisa Johnson  
Co-Chair, Asthma Alliance  
of North Carolina

*Karin Yeatts*

Karin Yeatts  
Co-Chair, Asthma Alliance  
of North Carolina



# Table of Contents

Updated story of DB....	i
Executive Summary	1
North Carolina Asthma Plan Contributors and Workgroups	3
Introduction	5
The Planning Process	7
History of the North Carolina Asthma Plan	7
The North Carolina Asthma Plan Facilitated Workshop	7
Follow-up Meetings	8
Partners and Stakeholders	9
Supporting Frameworks	11
National Heart, Lung and Blood Institute, National Asthma Education and Prevention Program, Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma	11
Healthy People 2020	11
The Burden of Asthma in the United States	11
The Burden of Asthma in North Carolina	12
<i>Adults</i>	12
<i>Children</i>	13
The North Carolina Asthma Plan 2013-2018 Goals and Objectives	17
Reducing Asthma Related Disparities	19
Improvement of Healthcare Delivery System for People with Asthma	22
Systems Changes in Schools and Child Care Centers	24
Community Involvement and Environmental Awareness	26
How We Will Sustain North Carolina’s Asthma Initiatives	29
Evaluation	30
Figure 2: Logic Model for the North Carolina Asthma Plan	33
Appendices	35
Appendix 1: Acronyms	37
Appendix 2: References for the North Carolina Asthma Plan	39
Appendix 3: References for The Burden of Asthma in North Carolina	41





## Executive Summary

Asthma is a common chronic disease. It affects the lungs, causing repeated episodes of wheezing, breathlessness, chest tightness, and nighttime or early morning coughing. In most cases, there is neither a known cause nor a known cure for the disease. Asthma may, however, be controlled by proper management, education, and avoidance of certain environmental triggers.

Asthma has significant effect upon many North Carolinians, and it particularly affects women, children, the elderly, certain racial and ethnic minority groups, and those with a low socioeconomic status. According to the North Carolina State Center for Health Statistics, in 2012, 11.7 percent of adults (age 18+) in North Carolina reported ever having been told by a healthcare provider that they have asthma and 7.7 percent reported that they still have asthma. According to the 2011 N.C. CHAMP survey, the parents or caregivers of 17.5 percent of children in North Carolina reported ever having been told by a healthcare provider that their child has asthma.

A large number of organizations and individuals in North Carolina are committed to asthma care and management. This *North Carolina Asthma Plan 2013-2018* was developed collaboratively by a number of organizations and individuals who work with asthma initiatives. This effort was coordinated by the North Carolina Asthma Program and the Asthma Alliance of North Carolina (AANC) under a cooperative agreement with the CDC. The *North Carolina Asthma Plan 2013-2018* can help maximize the use of resources among those working to reduce the burden of asthma. It will also be crucial in helping to identify new resources and opportunities. The goals of the plan are based largely on key surveillance findings. The goals are organized by four key areas as listed below. Outlined under the four goals are the key priorities for our state to address over the next five years to respond to the burden of asthma. The AANC and the North Carolina Asthma Program are absolutely committed to collaborating with partners and implementing strategies described in this revised plan for 2013-2018.



## The North Carolina Asthma Plan 2013-2018 Goals

### Reducing Asthma Related Disparities

- Increase access to asthma surveillance data to appropriate populations and organizations to inform policy and drive interventions, education, and behavior.
- Increase resources for asthma management and services for all at-risk populations.

### Improvement of Healthcare Delivery System for People with Asthma

- Increase the utilization of best practices and clinical guidelines during diagnosis and management of asthma.

### Systems Changes in Schools and Child Care Centers

- Decrease the number of asthma-related school absences.

### Community Involvement and Environmental Awareness

- Increase the number of evidence-based and recommended community-based asthma initiatives implemented.

## Sustainability

The *North Carolina Asthma Plan 2013-2018* will continue to evolve over time. The planning and development processes will also continue through work in AANC subcommittees, Asthma Advisory Team (a key advisory committee to the North Carolina Asthma Program) meetings, focus groups throughout the state, and other forums. The plan is a working document and will be reviewed annually by the North Carolina Asthma Program, the AANC, and other key stakeholder groups to assess the plan's effectiveness and progress toward reaching specified goals and objectives. Potential sources of funding and resources will also be identified. The plan will be formally updated and re-released in approximately five years.

# North Carolina Asthma Plan Contributors and Workgroups

## North Carolina Asthma Program Staff

Cindy Haynes-Morgan, MSA-PA, CHES, RHED	Asthma Program Manager
Winston Liao, MPH	Asthma Program Epidemiologist
Denisha Little-Greene, MMS PA	Asthma Program Consultant
Tanha Patel, MPH	Asthma Program Evaluator
Sally Herndon, MPH	Principal Investigator

## Asthma Alliance of North Carolina, Co-Chairs

Lisa Johnson, RRT, RCP, BAS	Vidant Medical Center
Karin Yeatts, PhD	University of North Carolina at Chapel Hill, School of Medicine

## Education and Public Awareness

Janet Capehart, RCP, AE-C	Vidant Bertie/Chowan Hospital, Pediatric Asthma Program
Connie Cooke, RRT, RCP	Vidant Edgecombe Hospital Active Healthcare
Lisa Feierstein, RN	Vidant Medical Center, Pediatric Asthma Program
Lisa C. Johnson, RRT, RCP, BAS	Albemarle Regional Health Services, Pediatric Asthma Program
Gayle Olson, RN, BA	Mission Hospitals, Inc.
Sharon Rohrer, RRT, AE-C	Mission Hospitals, Inc., Community Health Enhancement
Melinda Shuler, BSBA, RRT, RCP, AE-C	North Carolina Division of Public Health, School Health Unit
Casey Spear, RNC, MSN	American Lung Association
Gabrielle Steele	Vidant Medical Center
Virginia C. Tripp, RN, BSN, CCM	

## Environmental

Neasha Bryant, MPA	North Carolina Environmental Resource Program
Barbara Clifton	Craven County Health Department
Philisa Fowler	North Carolina Division of Public Health, Tobacco Prevention and Control Branch
Sally Herndon, MPH	North Carolina Division of Public Health, Tobacco Prevention and Control Branch
David Lipton, CIH	North Carolina Division of Public Health, Occupational and Environmental Epidemiology Branch
Amy MacDonald	University of North Carolina Institute for the Environment, University of North Carolina Chapel Hill Center for Environmental Health and Susceptibility
Ed Norman	Community Outreach and Engagement Care
Lauren Thie	North Carolina Division of Public Health, Environmental Health North Carolina Division of Public Health, Occupational and Environmental Epidemiology Branch

## Medical Management

G. Edward Davis, MD  
Pam Ellwood, FNP-C, CPNP, AE-C

Jean Koehn, CRT, RRT  
Lynne Taylor, BSN, RN

Pitt Children's Clinic  
Cleveland County Asthma Coalition;  
North Carolina Alliance of Respiratory Educators  
Visiting Respiratory Care, LLC  
Wake Area Health Education Center

## Surveillance

Kathleen Jones-Vessey, MS  
Karin Yeatts, PhD

North Carolina State Center for Health Statistics  
University of North Carolina at Chapel Hill,  
School of Medicine

## Special thanks to:

### North Carolina Asthma Plan Workshop Facilitators

Amanda Cornett, MPH

Lisa Harrison, MPH

Jim Martin, MPH

Lauren Thie, MPH

Steve Cline, DDS, MPH

North Carolina Division of Public Health,  
Center for Public Health Quality  
North Carolina Division of Public Health,  
Center for Public Health Quality  
North Carolina Division of Public Health,  
Tobacco Prevention and Control Branch  
North Carolina Division of Public Health,  
Occupational and Environmental Epidemiology Branch  
North Carolina Department of Health and Human Services,  
Health Information Technology

\*The North Carolina Asthma Program would also like to acknowledge the valuable feedback of stakeholders not included in the "contributor and workgroups" section. These stakeholders include, but are not limited to, county coalition workshop participants, Asthma Alliance meeting attendants, and attendees of the State Planning breakout session of the 2013 North Carolina Asthma Summit.

## Introduction

This plan is a significant step in our quest to reduce the burden of asthma in North Carolina. The burden of asthma in North Carolina is significant. In 2010, approximately 1.3 million North Carolinians had ever been diagnosed with asthma, and almost 900,000 are currently living and dealing with the disease. Significant gender, race, and age disparities demonstrate that targeted interventions among high-risk populations will be necessary. More detailed description of the burden of asthma is provided below in the Burden of Asthma section of the plan.

The *Burden of Asthma in North Carolina 2010* report provides foundation to the N.C. Asthma Plan by identifying at-risk populations and specific interventions needed to improve asthma outcomes. The *Burden of Asthma in North Carolina 2010* is a report developed by the North Carolina program staff to provide detailed surveillance data on asthma related disparities, health care utilization, and costs associated to asthma care and management. Brief summary of the *Burden of Asthma in North Carolina 2010* is provided later in the plan. Utilizing the surveillance data provided in the *Burden of Asthma in North Carolina 2010*, the Asthma Alliance of North Carolina (AANC) is able to work with local coalitions to draft and implement the N.C. Asthma Plan.

There are activities and interventions that can help reduce the burden of asthma. Some of these activities have been successful in the past and many are ongoing. North Carolina's recent efforts to build and strengthen local asthma coalitions across the state reinforce the commitment to partnerships and collaboration. Nearly half of North Carolina's counties have formed, or are in the process of forming, local asthma coalitions or workgroups. With the support of the state

asthma program, many of these groups are developing their own strategic plans for addressing asthma in their respective communities.

Several factors, such as environmental exposure to asthma triggers, availability of quality asthma-related medical care, access to adequate education on asthma management practices and community support for asthma-related policies, can have a substantial health effect on a person with asthma. Changes in these factors can help reduce the burden of asthma for a person with asthma. Access to care is also an issue that must be addressed. While effective asthma management practices do exist, unless people receive proper asthma education from a healthcare provider, those with asthma and parents of children with asthma may be unaware of measures that they can take to reduce the negative effects of their (or their children's) asthma. Reduced access to care is often associated with lower socioeconomic status and lack of health insurance. These factors, along with failure to recognize the severity of one's condition, can all effect a person's ability to take advantage of proper asthma care. A solid medical infrastructure relating to asthma is also necessary to improve the quality of life for persons with asthma. The N.C. Asthma Program, the AANC, and other key partners can work with physicians and healthcare professionals to ensure that patients receive asthma management plans and comprehensive asthma education, thus potentially reducing emergency room visits and asthma-related hospitalizations.

The development and support of policies to improve the lives of persons living with asthma are very important. Policies now exist that allow children to carry and self-administer asthma medications at school, which is important for avoiding a serious and potentially dangerous asthma exacerbation. Policies that will provide reimbursement to certified asthma educators are currently being studied, not only on the local and

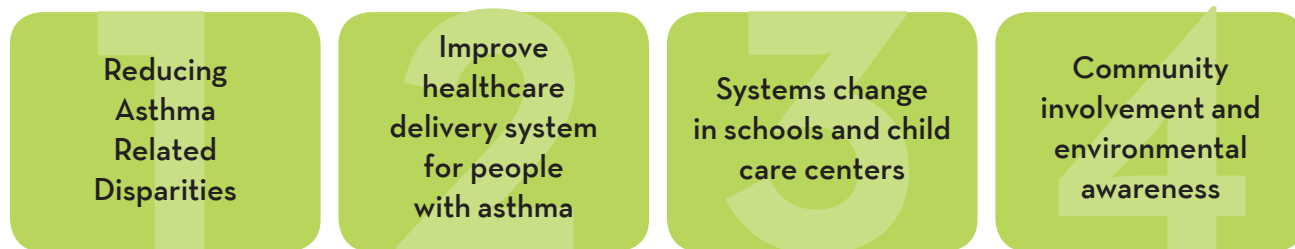
state levels but also on the national level. Increasing the number of certified asthma educators in the state increases the chance that a person with asthma and their family will receive appropriate asthma education.

Over the past six years, the Asthma Alliance of North Carolina members, with the assistance of the North Carolina Asthma Program staff, have hosted an annual N.C. Asthma Summit that features presentations on important asthma issues. The day-long event provides networking opportunities for local asthma coalitions and community representatives. Participants include health care professionals, school personnel, environmental health specialists, community leaders, and other key stakeholders from across the state and region. The summit planning committee will continue its efforts to support asthma initiatives in North Carolina to improve the quality of life for those living with asthma.

Based on the surveillance data, clinical guidelines, evidence-based interventions, and recommended activities, the AANC members, the North Carolina Asthma Program staff and other key stakeholders identified four key goal areas that need to be addressed in this plan. These four goal areas are:

Outlined under the four goals are the key priorities for our state to address during the next five years to respond to the burden asthma. The AANC and the North Carolina Asthma Program are absolutely committed to collaborating with partners and implementing strategies described in this revised plan for 2013-2018.

Asthma is one of the most common chronic diseases, and it cannot be cured. However, North Carolina can make significant strides in the fight against the negative effects of asthma by increasing access to appropriate care for all persons with asthma; having a strong medical community that is knowledgeable about asthma management techniques; supporting policies that promote an improved quality of life; and knowing what measures can be taken to control triggers of the disease.



## The Planning Process

### History of the North Carolina Asthma Plan

In 1998, the state health director convened the North Carolina Childhood Asthma Management Task Force because of concerns about the rising number of children with asthma symptoms. Its charge was to assess pediatric asthma and recommend ways to more effectively address the disease from both state and local levels. The resulting task force report became the foundation for building a comprehensive, cohesive system of care for children and adults with asthma.

In the spring of 2000, the task force broadened its focus to include adult asthma, established a more formal organizational structure, and changed its name to the Asthma Alliance of North Carolina (AANC). Over the years, the AANC formed several working committees – Surveillance, Health Disparities, Medical Management, Education and Public Awareness, and Environmental. Through these committees, AANC members work together to collect data, develop asthma-related policies, build local asthma coalitions, educate health professionals and patients, and reduce environmental asthma hazards.

In September 2004, the N.C. Asthma Program received funding from the Centers for Disease Control and Prevention (CDC) to accomplish the following: 1) establish a viable program infrastructure; 2) develop a comprehensive state asthma plan that addresses asthma in all ages, racial and ethnic groups and in multiple settings; and 3) enhance existing surveillance systems for asthma to better monitor prevalence, morbidity, mortality, and work-related asthma. The North Carolina Asthma Program infrastructure was established in September 2005 when the Asthma Program

became one of the 36 states awarded funding from CDC for a state asthma program. After infrastructure was in place, the North Carolina Asthma Program collaborated with the AANC, the Asthma Advisory Team (AAT), and other key partners to gather information and update the North Carolina Asthma Plan for 2007-2012 timeline.

In 2012, the North Carolina Asthma Program staff and the AANC members continued to collaborate with key partners to review the progress that North Carolina has made and discuss how to move forward to address asthma in North Carolina. In January 2012, the Asthma Advisory Team recommended having focus areas for the current priorities. The overarching goal is to reduce health disparities related to asthma through surveillance monitoring to track and identify specific target populations for asthma interventions.

### The North Carolina Asthma Plan Facilitated Workshop

The Asthma Advisory Team reviewed the *Burden of Asthma in North Carolina 2006* and a draft of the *Burden of Asthma in North Carolina 2010* in 2011. Upon identifying the burden of asthma in North Carolina, the Asthma Advisory Team proposed to focus statewide asthma efforts in key priority areas. These key priority areas include:

- Asthma Related Disparities.
- Healthcare Delivery System.
- Schools and Child Care Centers.
- Communities.

This list of key priorities were presented and discussed at a facilitated *North Carolina Asthma Plan 2013-2018* workshop hosted by the North Carolina Asthma Program in February 2012. During the workshop, these priorities were approved by the participants and the North Carolina Asthma

Program. The facilitated workshop was hosted to allow public health leaders, community representatives, and asthma advocates to collectively identify key priorities, goals and objectives to facilitate the development of the *North Carolina Asthma Plan 2013-2018*.

The facilitated workshop was organized to allow participants the opportunity to provide input and lend their knowledge to as many areas of the *North Carolina Asthma Plan 2013-2018* as possible. At the beginning of the facilitated workshop, the participants were provided with updated surveillance data on the burden of asthma in North Carolina along with national *Healthy People 2020* objectives related to asthma. The participants were requested to draft goals and objectives which are in line with the surveillance data and the national *Healthy People 2020* objectives.

In addition, participants in the facilitated workshop were given a worksheet with information on how to develop goals and objectives that are “SMART” (specific, measurable, attainable, relevant, and time-bound). This worksheet, along with an accompanying presentation by an external consultant, guided participants through the process of “making objectives SMART” and asking questions about the objective/strategy as they were being developed.

The workshop featured three rounds of breakout sessions focused on the AANC’s six committees. The six AANC committees are:

- Education and Public Awareness.
- Environmental.
- Health Disparities.
- Medical Management.
- Policy.
- Surveillance.

It was decided to have the participants’ breakout into AANC’s six committees because that is how the previous *North Carolina Asthma Plan 2007-2012* was organized. Participants were randomly assigned to topic areas for their first two sessions. The third and final round of breakouts allowed participants to attend the session around the topic area in which they considered themselves to be an “expert.” The expert panel in each of the AANC’s six committees reviewed each goal and objective proposed in the first two rounds. After reviewing, the expert panel developed a set of goals and objectives to present to the group at large and to the AANC. After initial approval by facilitation workshop participants, these goals and objectives became the initial draft of our strategic plan.

## Follow-up Meetings

The February 2012 workshop participants and the AANC participants continued to work on addressing the key priority areas over the year. In February 2013, the AANC participants reviewed the draft prioritized goals, objectives, and strategies under each of the key priority areas. During the February 2013 meeting, the participants finalized the goals, objectives, and strategies for each of the key priority areas. The final prioritized goals identified for the *North Carolina Asthma Plan 2013-2018* are listed below by the key priority areas identified by the Asthma Advisory Team. The objectives and strategies for each of these prioritized goals are provided in the Strategic Plan section.



### Reducing Asthma Related Disparities

- Increase access to asthma surveillance data to appropriate populations and organizations to inform policy and drive interventions, education, and behavior.
- Increase resources for asthma management and services for all at-risk populations.

### Improvement of Healthcare Delivery System for People with Asthma

- Increase the utilization of best practices and clinical guidelines during diagnosis and management of asthma.

### Systems Changes in Schools and Child Care Centers

- Decrease the number of asthma-related school absences.

### Community Involvement and Environmental Awareness

- Increase the number of evidence-based and recommended community-based asthma initiatives implemented.

## Partners and Stakeholders

The N.C. Asthma Program acknowledges the support and contributions of its many valued partners and stakeholders. In order to create the most comprehensive *North Carolina Asthma Plan 2013-2018* possible, the support of a wide range of individuals, groups, and organizations was sought and obtained. Those represented in North Carolina Asthma Plan development include asthma education programs, local health department representatives, environmental specialists, nurses, physicians, respiratory therapists, school health professionals, local asthma coalition members, state health department representatives, statisticians, non-profit organizations, and people with asthma, among others.



## Supporting Frameworks

### National Heart, Lung and Blood Institute, National Asthma Education and Prevention Program, Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma

The Expert Panel Report 3 (EPR 3) not only serves as guidelines for diagnosing and managing asthma but they are key in determining the direction and focus of the goals and priorities set forth in the North Carolina Asthma Plan. The four essential components of asthma care (assessment and monitoring, patient education, control of factors contributing to asthma severity, and pharmacologic treatment) helped build the framework for the North Carolina Asthma Plan. The report was originally developed in 1991 and periodically updated by an expert panel to be used as a source for clinical practice tools and educational materials for patients and the public. The National Asthma Education and Prevention Program (NAEPP) continues its efforts to keep clinical practice recommendations updated to assist clinicians with evidence-based findings to help achieve good asthma control. The North Carolina Asthma Program will continue to promote the Guidelines for the Diagnosis and Management of Asthma across the state through education and awareness activities.

### Healthy People 2020

Healthy People 2020 Objectives for asthma share similar goals as the N.C. Asthma Program. The

*North Carolina Asthma Plan 2013-2018* adapted these Healthy People 2020 goals as the over-arching long-term goals for the plan. These goals include:

- Reduce asthma deaths.
- Reduce hospitalizations for asthma.
- Reduce emergency department visits for asthma.
- Reduce activity limitations among persons with current asthma.
- Reduce the proportion of persons with asthma who miss school or work days.
- Increase the proportion of persons with current asthma who receive formal patient education.
- Increase the proportion of persons with current asthma who receive appropriate asthma care according to the National Asthma Education and Prevention Program (NAEPP) Guidelines.

### The Burden of Asthma in the United States

Asthma is a public health priority in the United States. According to the National Health Interview Survey from 2011, an estimated 39.5 million people (12.9% of total population), including 10.5 million (14.0% of all children) children in the United States had been diagnosed with asthma in their lifetime. In addition, 18.9 million (8.2%) adults and 7.1 million (9.5%) children still have asthma (CDC, 2013). Nationally, asthma costs approximately \$50.1 billion per year for medical expenses, \$3.8 billion per year for loss of productivity resulting from missed school or work days, and \$2.1 billion per year from premature death, for a total of \$56 billion in 2007 (according to 2009 dollars) (CDC, 2013).

## The Burden of Asthma in North Carolina

Asthma is one of the most prevalent chronic diseases in North Carolina. The N.C. Asthma Program published the *Burden of Asthma in North Carolina 2006* to give those who work to reduce the burden of asthma a clear picture of what is going on in North Carolina. The N.C. Asthma Program revised the *Burden of Asthma in North Carolina* report with updated 2010 data in 2013. The revised *Burden of Asthma in North Carolina 2010* report examines the burden of asthma in the state using the 2010 data, including data available on prevalence, symptoms and management, healthcare utilization and cost of asthma, mortality, and Healthy People 2010. Some of the important surveillance data are presented here to illustrate the importance to addressing the burden of asthma in North Carolina.

## Asthma Prevalence

The asthma prevalence data for North Carolina were obtained from three surveys: the North Carolina Behavioral Risk Factor Surveillance System (N.C. BRFSS), the Childhood Health Assessment and Monitoring Program (N.C. CHAMP), and the North Carolina Youth Risk Behavior Survey (N.C. YRBS). The N.C. BRFSS is population-based, annual, random telephone survey of residents aged 18 and older in households with telephones.<sup>3</sup> The N.C. CHAMP survey looks at children age 17 and younger, and is conducted as a continuation of the N.C. BRFSS.<sup>4</sup> The children who are selected for the N.C. CHAMP are chosen through a child selection module conducted during the N.C. BRFSS. The N.C. YRBS is a school-based survey conducted by state and local education and health agencies in middle and high schools.<sup>5</sup>

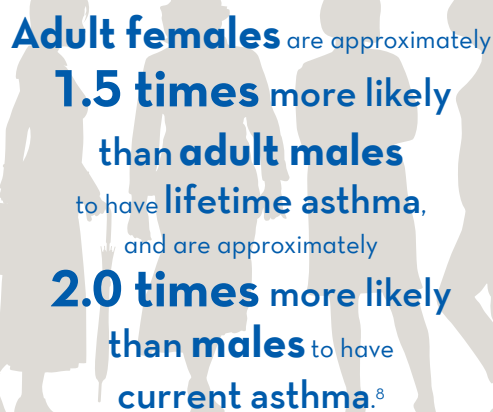
Asthma prevalence is the ratio of the total number of people with asthma to the number of given population at a specific time.<sup>6</sup> Asthma is a difficult disease to quantify in a population, because asthma may appear to resolve itself over time. Although persons who are diagnosed with asthma have the possibility of being symptom-free for long periods of time, once a person is diagnosed with asthma, it is with them for the rest of their lives.<sup>7</sup> Therefore, we look at the prevalence of asthma primarily in two ways, lifetime (“ever had”) asthma prevalence and current (“still have”) asthma prevalence.

Lifetime asthma is determined based on an affirmative answer to the question on the N.C. BRFSS, ***“Have you ever been told by a doctor, nurse, or other health professional that you have asthma?”***

Current asthma is determined based on an affirmative response to the lifetime asthma prevalence question, as well as an affirmative response to the subsequent question ***“Do you still have asthma?”***<sup>8</sup>

### Adults

- In 2011, approximately 972,554 adults (age ≥18 years) (13.2% of the North Carolina population) reported ever having been told by a healthcare provider that they have asthma. Of those, 648,369 (8.8%) reported that they still have asthma.<sup>8</sup>



**Adult females** are approximately  
**1.5 times more likely**  
 than **adult males**  
 to have **lifetime asthma,**  
 and are approximately  
**2.0 times more likely**  
 than **males** to have  
**current asthma.**<sup>8</sup>

- Adults living in households with an annual income less than \$15,000 are approximately twice as likely to have lifetime asthma and are approximately 2.3 times as likely to have current asthma as those who live in households that make more than \$15,000 a year.<sup>8</sup>

## Children

- In 2011, approximately 400,499 children (age ≤ 17 years) (17.5 % of the population) reported ever having been told by a healthcare provider that they have asthma. Of those, approximately 249,454 (10.9%) reported that they still have asthma.<sup>9</sup>



- In 2011, 22.4 percent of youth in grades 6-8 reported having ever been told that they had asthma; of those, 12.5 percent reported that they still had asthma.<sup>10</sup> For the same year, 22.8 percent of youth in grades 9-12 reported having ever been told that they had asthma; of those, 11.6 percent reported that they still had asthma.<sup>11</sup>

According to estimates from the 2011 National Health Interview Survey (NHIS) data, the national lifetime child asthma prevalence was 14.0 percent. The national current child asthma prevalence was 9.5 percent.<sup>12</sup>

## Asthma Management and Quality of Life

The goal of effective management of asthma is to allow people with asthma to function with minimal restrictions and enjoy a good quality of life. Because asthma symptoms can disrupt the airways, they can sometimes result in sleepless nights, missed school/work days, or limitations in regular activity. These symptoms can also affect the quality of life for an individual with asthma. Therefore, asthma surveillance systems tend to monitor and support management of asthma by collecting data on frequency of asthma attacks or episodes over time, daytime and nighttime symptoms, life and activity limitations, measure quality of health, and measure utilization of school and childcare asthma action plans to assist students and children with their asthma management.<sup>13</sup>

Data to measure asthma management and quality of life in North Carolina were obtained from several sources, including the 2008 N.C. BRFSS, the N.C. YRBS, and the N.C. CHAMP, as well as the N.C. School Health Profile Survey, and the National Survey on Children's Health.

- Approximately 50 percent of North Carolinian adults with current asthma experienced an asthma attack or episode in the past 12 months.<sup>14</sup>
- Approximately 47 percent of North Carolina adults with current asthma reported experiencing asthma symptoms a minimum of once a week over the past 30 days. Of those who reported having any symptoms, 17.3 percent reported experiencing asthma symptoms every day during those 30 days.<sup>14</sup>
- More than 37 percent of adults with current asthma reported their general health status as poor or fair compared to 15.8 percent of adults without current asthma.<sup>14</sup>

- More than 25 percent of adults in North Carolina with current asthma were unable to work or carry out normal activity due to their asthma at least one day during the last 12 months.<sup>14</sup>
- Among children in North Carolina with current asthma, approximately half (49.5%) missed at least one day of school due to their asthma in the last year. Of that group, 41.5 percent of children with asthma missed between one and 10 days of school in the past 12 months due to their asthma, and 7.9 percent of children with asthma missed 11 or more days due to their asthma.<sup>15</sup>
- In 2010, 57.1 percent of North Carolina children with current asthma had received an asthma management plan,<sup>15</sup> while only 25.2 percent of North Carolina adults with current asthma reported having received one.<sup>16</sup>
- In 2011, the proportions of students who reported having an asthma management plan on file at school were 5.0 percent among students in 6-8 grades<sup>10</sup> and 8.0 percent among students in grades 9-12.<sup>11</sup>

and total amount billed for the hospital stay. Several types of hospitals are not included in this database, such as military and veteran hospitals, ambulatories, specialty hospitals, rehabilitation facilities, psychiatric facilities and prison hospitals.

Hospitalizations attributable to asthma often result from uncontrolled asthma. Serious episodes of asthma may be avoided with proper treatment, good asthma management techniques, ongoing education, and support for patients.

- In 2010, females in North Carolina had a higher asthma hospitalization rate (13.4 per 10,000 population) than males (8.4 per 10,000 population).<sup>17</sup>
- In 2010, the highest asthma hospitalization rates in North Carolina occurred in the youngest age group, ages 0-4 years (26.4 per 10,000 population). The rates then steadily decreased through middle age and then began increasing again in the 65+ age group to a rate of 17.3 per 10,000 population.<sup>17</sup>



In 2010, **total charges for hospitalizations** in North Carolina for a **primary diagnosis of asthma exceeded \$132 million**. This represented an **average charge of \$12,632 per asthma hospital stay**.<sup>17</sup>

A visit to the emergency department because of asthma is often an indication of inadequate long-term management of asthma.

- In 2008, almost a third (33.0%) of adults with current asthma in North Carolina visited an emergency department or urgent

## Health Care Utilization

Healthcare utilization data include information on hospitalizations and emergency room visits due to a primary diagnosis of asthma. Data on hospitalizations and emergency room visits are obtained from three primary sources, the N.C. BRFSS, the N.C. CHAMP, and the State Center for Health Statistics' hospital discharge database. The hospital discharge database consists of patient-level information drawn from the billing database on diagnoses, date of admittance and date of discharge, length of stay, information of the patient (such as county of residence and gender), patient diagnosis at discharge, payer,

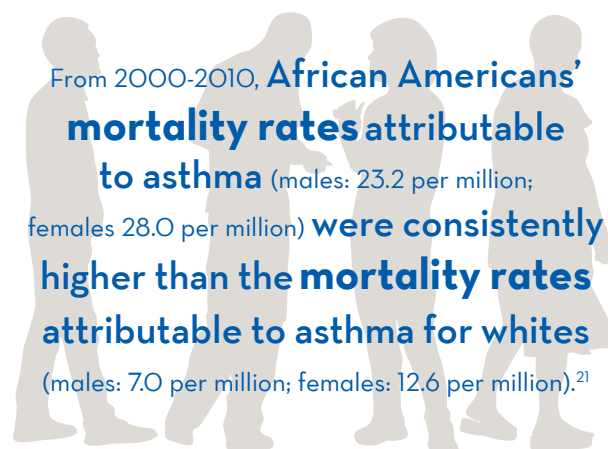
care center in the 12 months before being surveyed. Of that 33.0 percent, more than one-fifth (22.1%) went three or more times.<sup>17</sup>

- After combining the 2005-2010 N.C. CHAMP survey (because of small sample sizes) more than a quarter (25.8%) of children with current asthma in North Carolina visited an emergency department or urgent care clinic because of their asthma in the 12 months before being surveyed.<sup>17</sup>
- In North Carolina, African American children were more than twice as likely as white children to have visited the hospital emergency room or urgent care clinic because of their asthma.<sup>19</sup>

## Mortality

Deaths attributable to asthma, while not common, are preventable and represent a breakdown in successful disease management. The national data from 2010 showed that 3,404 persons died in the United States that year from a primary cause of asthma,<sup>20</sup> while 102 people in North Carolina died from a primary cause of asthma in that same year.<sup>21</sup>

- Since 2000 in North Carolina, the number of deaths attributable to a primary cause of asthma has decreased from 107 to 89 in 2010 and then increased to 113 deaths in 2012.<sup>21</sup>
- Asthma mortality is higher among females than males. In North Carolina in 2010, females had a higher mortality rate (12.2 per million population) attributable to a primary cause of asthma than males (8.4 per million population). These data are consistent with previous years.<sup>21</sup>



## Disparities

African Americans, females, the very young, and the very old are impacted at a greater extent than the general population with asthma in North Carolina. The North Carolina mortality data show that African Americans die at a greater rate attributable to asthma than whites. Latest data available from the 2008 N.C. BRFSS showed that more African American adults than white adults reported having visited an emergency department at least once in the past 12 months.<sup>14</sup> In 2010, the asthma hospitalization rate among African Americans (21.0 per 10,000 population) was 2.8 times higher than whites (7.5 per 10,000 population) and 3.9 times higher than other minorities (5.4 per 10,000 population).<sup>17</sup> Females are hospitalized attributable to asthma more than males, and die from asthma at a greater rate. The very young and the very old are hospitalized due to asthma at a greater rate than other age groups, and the very old die at a much greater rate attributable to asthma as a primary cause than those who are younger.

## Cost of Asthma

Asthma is a significant economic burden at national, state and local levels. According to the National Heart, Lung, and Blood Institute, in 2010, annual expenditures for health and lost productivity due to asthma as primary diagnosis were estimated at \$20.7 billion in the United States. Of that amount, \$15.6 billion were direct costs (including physician visits, hospital stays, and medications), \$3.1 billion were morbidity-related, and \$2.0 billion were mortality-related. Among the direct costs, prescription drugs totaled \$5.9 billion, followed

hospital care (\$5.5 billion) and physician services (\$4.2 billion).<sup>23</sup>

The North Carolina State Center for Health Statistics provided information on the amount billed for hospitalization due to a primary cause of asthma for the years 2006 through 2010. Table 2 displays the total cost of hospitalizations for a primary diagnosis of asthma for all ages for each year, as well as cost of hospitalization per individual stay and average length of stay for a primary diagnosis of asthma.

**Table 2. Hospital Charges for Primary Diagnosis of Asthma\*, by Total Hospital Charges and Average Charges per Stay per year, 2006 - 2010**

Year	Total Discharges	Avg. Length of Stay (Days)	Total Hospital Charges	Average Charges per Stay
<b>2006</b>	10,533	3.6	\$104,384,471	\$ 9,916
<b>2007</b>	10,535	3.6	\$110,321,725	\$10,478
<b>2008</b>	10,689	3.5	\$122,508,867	\$11,462
<b>2009</b>	10,986	3.4	\$132,504,720	\$12,061
<b>2010</b>	10,471	3.2	\$132,224,232	\$12,632

\*ICD-9 diagnostic codes 493.00 through 493.92; data includes only state residents served in North Carolina hospitals; numbers and rates shown may be smaller than the actual hospital use for counties that border other states.

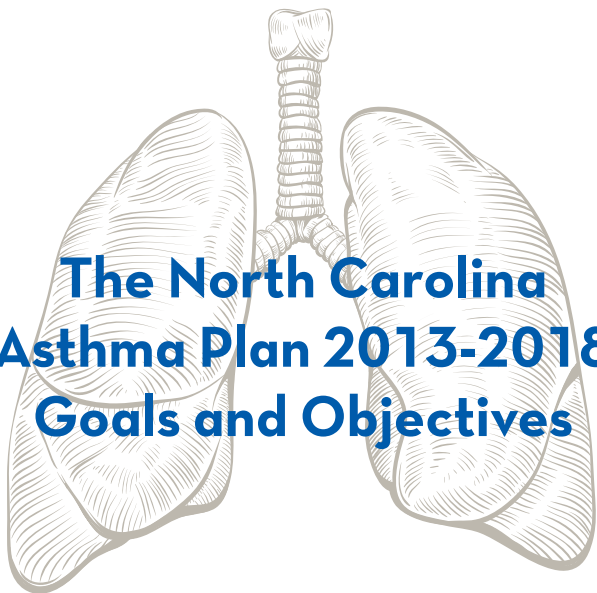
Data Source: *North Carolina State Center for Health Statistics, North Carolina Hospital Discharge 2006-2010 (Data as of May 31, 2012)*

## Summary of the Burden

This plan is a significant step in our quest to reduce the burden of asthma in North Carolina. The burden of asthma in North Carolina is significant. In 2010, approximately 1.3 million North Carolinians have ever been diagnosed with asthma, and almost 900,000 are currently

living and dealing with the disease. Significant gender, race, and age disparities demonstrate that targeted interventions among high-risk populations will be necessary. *The North Carolina Asthma Plan* presents a comprehensive approach to addressing issues that face these high-risk populations, as well as issues that face all North Carolinians with asthma and those who relate to these individuals.



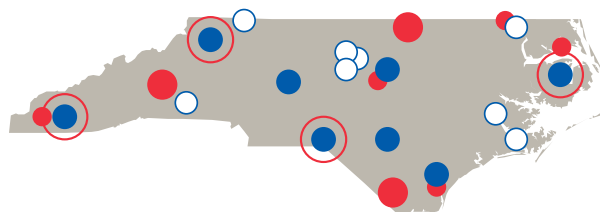


**The North Carolina  
Asthma Plan 2013-2018  
Goals and Objectives**

An anatomical illustration of the human respiratory system, showing the trachea (windpipe) and two lungs. The drawing is in a simple, line-art style with some shading to indicate depth. The text is centered over the illustration.



## Reducing Asthma Related Disparities



**GOAL 1** Increase access of asthma surveillance data to appropriate populations and organizations to inform policy and drive interventions, education, and behavior.

**Objective 1.1:** By December 2018, increase the number of surveillance data resources available to asthma stakeholders.

**Lead Partner:** Education and Public Awareness, Environmental, Medical Management Committees, North Carolina Asthma Program

### Strategies:

- Beginning in August 2013, continue to distribute bi-annual surveillance update newsletter to asthma stakeholders across North Carolina.
- By August 2013, update the North Carolina Asthma Program website to make the *The Burden of Asthma in North Carolina 2010* report available for download by asthma stakeholders.
- By December 2013, distribute 100 print copies of the *The Burden of Asthma in North Carolina 2010* report to asthma stakeholders across North Carolina.
- By December 2014, develop and distribute eight fact sheets and/or reports on gaps in asthma-related management, policy, and environmental factors to asthma stakeholders across North Carolina.

- By December 2015, add two new asthma questions related to children on the Behavior Risk Factor Surveillance System (N.C. BRFSS).
- Through December 2018, update the fact sheets, reports, and other surveillance materials as needed.
- Through December 2018, promote the use of asthma vulnerability data in relevant climate change work and publications.

**Objective 1.2:** By December 2018, increase the utilization of *The Burden of Asthma in North Carolina 2010* report to identify and educate partners on who is at-risk for asthma.

**Lead Partner:** North Carolina Asthma Program, Education and Public Awareness Committee

### Strategies:

- By May 2014, collaborate with non-traditional partners such as faith-based organizations, health scientists, and Office of Minority Health and Health Disparities to present surveillance data on at-risk populations for asthma at three different events or conferences.
- By December 2015, collaborate with other state chronic disease programs to conduct at least one special analysis on co-morbidities among individuals with asthma.
- By December 2016, work with other state chronic disease programs to develop at least one educational material addressing the need for better care and management for those at risk for asthma and other co-morbidities.

- d) Through 2018, attend five meetings, conferences, and webinars to present data from *The Burden of Asthma in North Carolina 2010* and any other scientific studies or analysis conducted.

**Objective 3:** By December 2018, continue to monitor which disparities are due to asthma management gaps and which are a true representation of high-risk populations.

**Lead Partner:** North Carolina Asthma Program, Education and Public Awareness Committee

**Strategies:**

- a) By December 2014, conduct at least one surveillance needs assessment to identify gaps in data.
- b) By December 2014, establish a system to report on ED visits through NC DETECT and hospital discharge data from the N.C. State Center for Health Statistics.
- c) By December 2014, collaborate with Native American Tribes and Health Departments in Swain and Robeson counties to get data on asthma-related outcomes in the Qualla Boundary and in Robeson.
- d) By May 2015, investigate how existing surveillance data can contribute to research efforts seeking understanding of the links between environment, climate, and asthma.
- e) Through December 2018, examine data from the North Carolina Child Health Assessment and Monitoring Program (N.C. CHAMP) and the Behavioral Risk Factor Surveillance System (N.C. BRFSS) to identify gaps in asthma management.

**GOAL 2** Increase resources for asthma management and services for all at-risk populations.

**Objective 1:** By December 2014, increase the number of asthma resources and self-help management strategies available to at-risk populations.

**Lead Partner:** Education and Public Awareness Committee, North Carolina Asthma Program

**Strategies:**

- a) Through December 2018, develop six factsheets and/or other asthma management materials tailored to address concerns related to at-risk populations.
- b) By December 2013, increase the frequency of communication between the North Carolina Asthma Program and community at large regarding new resources for asthma management and services.
- c) By August 2014, promote the Asthma and Allergy Foundation’s recommended asthma-related policies.
- d) By December 2014, provide 200 printed copies of *Resource Guides* to Alliance partners and other Healthcare organizations so that they can be made available at various meetings, conferences, and events.
- e) By December 2014, develop partnership with six local partners such as: local hospitals, local health departments, and other asthma focused organizations to make the *Resource Guide* available on their websites and/or offices as a resource.
- f) By December 2014, work closely with the Office of Rural Health and Minority Health to ensure that at least two different asthma materials are available on their list of resources, online and/or in print.

- g) By January 2015, collaborate with at least five non-traditional partners such as faith-based organizations, Boys and Girls Club, Big Brother/Big Sister, YMCA, and other community-based organizations to disseminate and promote asthma care and education materials.

**Objective 2:** By December 2016, increase the collaboration with local housing authorities to effectively implement policies that address asthma-related concerns in housing environments.

**Lead Partner:** Education and Public Awareness, Environmental Committee, North Carolina Asthma Program

### Strategies:

- a) By December 2013, in collaboration with N.C. Tobacco Prevention and Control Branch (N.C. TPCB), develop an educational material focused on secondhand smoke exposure as a trigger for asthma exacerbations, especially among multi-unit housing settings.
- b) By December 2014, assist N.C. TPCB in their efforts to promote smoke-free policies in multi-unit housing by providing data on asthma and secondhand smoke.
- c) By December 2014, collaborate with Community Transformation Grant (CTG), Department of Housing and Urban Development (HUD), and other stakeholders working on improving home environment to promote education on environmental triggers affecting asthma residents, such as lead, mold, infestations, etc.
- d) By December 2015, establish partnerships and provide one asthma education training to CTG, N.C. TPBC, HUD, Healthy Homes Initiative, Legal Aid of North Carolina, and other organizations that have field staff working directly in the community to address indoor air quality.
- e) By December 2016, provide technical assistance (such as providing educational materials and referrals for home assessments) to local housing authorities who want to implement policies addressing asthma-related concerns in housing environments.

## Improvement of Healthcare Delivery System for People with Asthma

**GOAL 1** Increase the utilization of best practices and clinical guidelines during diagnosis and management of asthma.

**Objective 1:** By December 2018, increase the use of the National Institute of Health and National Heart, Lung, and Blood Institute (NIH/NHLBI) guidelines and/or Global Initiative for Asthma (GINA) guidelines among clinical providers.

**Lead Partner:** Medical Management Committee, Education and Public Awareness Committee

### Strategies:

- a) By May 2014, collaborate with healthcare provider workgroups such as Community Care Network of North Carolina (CCNC) Asthma workgroup, North Carolina Area Health Education Centers (N.C. AHEC), North Carolina Pediatric Association, North Carolina Nurses Association to provide resources on NIH/NHLBI and GINA guidelines for asthma.
- b) By May 2015, offer technical assistance (such as providing educational materials and/or referrals for trainings on clinical guidelines) to encourage utilization of clinical guidelines for asthma by professional medical organizations.



- c) Through December 2018, continue to partner with healthcare provider workgroups to promote evidence-based guidelines to reduce the burden of asthma in North Carolina.

**Objective 2:** By August 2014, increase the number of asthma care providers who are trained on quality improvement and meaningful use concept.

**Lead Partner:** Medical Management Committee, Education and Public Awareness Committee

### Strategies:

- a) By December 2013, work with the N.C. AHEC, the N.C. Center for Public Health Quality, local health departments, and N.C. Health Information Technology to understand the requirements of Affordable Care Act (ACA), in terms of implementation of Electronic Medical Records (EMR).
- b) By December 2013, partner with N.C. AHEC and CCNC to educate asthma providers on the quality improvement and meaningful use concept at two training sessions.
- c) By August 2014, collaborate with N.C. AHEC, CCNC, N.C. Center for Public Health Quality to generate one report on how ACA's EMR requirements can be adapted to promote the concept of meaningful use, among asthma care providers.

**Objective 3:** By December 2015, increase the number of children diagnosed with asthma who receive written asthma action plans from their healthcare provider.

**Lead Partner:** Medical Management Committee, Education and Public Awareness Committee

**Strategies:**

- a) By May 2014, promote the use of asthma action plan as part of at least three asthma awareness materials.
- b) By May 2014, disseminate 1,000 copies of the statewide asthma action plan developed by the N.C. Asthma Program, in partnership with CCNC, as the recommended asthma action plan to asthma-related healthcare service providers, schools, child care centers, and other partnering organizations.
- c) By August 2014, make asthma action plans available for download through N.C. Asthma Program website, Community Care of North Carolina (CCNC) website, and on other partners' websites.
- d) By December 2015, train and promote consistent use of asthma action plan among 150 healthcare providers through conference presentations, webinars, or special training sessions.

**Objective 4:** By December 2016, increase the number of N.C. healthcare providers who treat people with asthma that have a comprehensive understanding of the medical home concept.

**Lead Partner:** Medical Management Committee

**Strategies:**

- a) By August 2014, partner with N.C. AHEC and North Carolina Champion from the Medical Home Chapter Champions Program on Asthma (MHCCPA) to provide education on the medical home concept and basic quality improvement techniques for working on system changes in clinical practices to 100 state healthcare providers.
- b) By August 2015, collaborate with N.C. AHEC, MHCCPA, Asthma Alliance of North Carolina (AANC), N.C. Pediatric Society, Community Care of Wake & Johnston Counties, and other partners to promote the medical home concept for medical practices in North Carolina at five community events such as conferences, education trainings, presentations, and Asthma Awareness campaigns.
- c) By March 2016, generate one success story of clinical practices who have already adapted the medical home concept when managing their asthma patients.
- d) By March 2016, distribute and utilize success story to promote the effectiveness of medical home concept to 100 healthcare providers.
- e) By May 2016, encourage primary care providers to develop action steps to improve one or more aspects of the medical home concept in their practices by collaborating with N.C. AHEC, N.C. Center for Public Health Quality, and MHCCPA to provide technical assistance to 15 primary care providers.

## Systems Changes in Schools and Child Care Centers

**GOAL 1** Decrease the number  
of asthma-related  
school absences.

**Objective 1:** Through December 2018, increase access to educational materials showing the importance of school nurses for children with asthma.

**Lead Partner:** Education and Public Awareness Committee

### Strategies:

- a) By December 2015, coordinate with Women and Children's Branch of N.C. Division of Public Health to develop one educational material addressing the need for more school nurses in schools, especially for children with asthma.
- b) By August 2016, provide educational materials to agencies promoting the increase of school nurse ratio to meet one school nurse for every 750 students.
- c) Through December 2018, communicate with legislative representatives every other year regarding students' access to regular asthma management assistance and the current availability of school nurses.



**Objective 2:** By December 2018, increase opportunities for school staff, coaches, school health professionals, school personnel and students to receive educational training through the Asthma Education Curriculum for School Nurses and Other School Professionals trainings.

**Lead Partner:** Education and Public Awareness Committee, North Carolina Asthma Program

### Strategies:

- a) Starting January 2013, provide technical assistance on asthma action plans and medication adherence resources to school nurses and asthma educators that have completed trainings with N.C. Asthma Program.
- b) By December 2014, partner with regional school health nurse consultants, as well as asthma educators to provide access to trainings and educational material focused on asthma care and management in 100 North Carolina School Districts.
- c) By December 2015, collaborate with the School Nurses Association to incorporate asthma education curriculum as part of school nurse certification process.
- d) By December 2015, collaborate with N.C. AHEC and the School Nurses Association to provide continuation education credits for school staff receiving asthma care and management trainings.



- e) Through December 2018, continue to support local asthma coalitions and workgroups in promoting North Carolina asthma education curriculums.
- f) Through December 2018, provide asthma education to a total of 100 school nurses, school staff, coaches, school health professionals, school personnel, and students.

**Objective 3:** By December 2018, increase the number of school districts that have successfully implemented asthma-related policies (115C-375.2 and the Children’s Health Act of 2006) in schools from 0 to 10.

**Lead Partner:** Education and Public Awareness Committee

#### Strategies:

- a) By December 2013, collaborate with Division of Air Quality Control, Department of Public Institution (DPI), and other state agencies to ensure that asthma is on the table when developing new policies related to air quality and physical environment in schools.
- b) By December 2014, provide educational resources to school staff to assist with adoption of asthma-friendly physical environment for students.
- c) By December 2014, collaborate with DPI and School Health Program to disseminate asthma educational materials and asthma care and management resources to school staff and students, including print copies of asthma action plans.
- d) By December 2015, work with six local health departments to promote the anti-idling and integrated pest management provisions in the School Children’s Health Act.
- e) By December 2018, work with DPI and six local health departments to effectively implement current asthma-related policies in schools

(e.g., 115C-375.2 and the Children’s Health Act of 2006) and new policies as they relate to air quality, physical environment and asthma management.

- f) By December 2018, partner with the Division of Air Quality to promote mass transit, smart growth, alternative fuels, and open burning awareness through two asthma awareness materials.

**Objective 4:** By December 2018, increase the number of trainings and technical assistance provided to child care providers and early childhood professionals.

**Lead Partner:** Education and Public Awareness Committee

#### Strategies:

- 1) By December 2013, engage 20 Smart Start, Head Start, and other child care resource and referral agencies in discussions related to providing *Asthma Education Curriculum for Childcare Providers* trainings.
- 2) By May 2014, establish a partnership to offer child care trainings at annual Child Care Health Consultants conference.
- 3) By December 2014, start providing technical assistance and asthma education trainings through 20 child care resource and referral agencies.

## Community Involvement and Environmental Awareness



### GOAL 1

**Increase the number of evidence-based and recommended community-based asthma initiatives implemented.**

**Objective 1:** By December 2014, increase access to asthma education trainings for healthcare professionals working in the geriatric field.

**Lead Partner:** Education and Public Awareness Committee, Medical Management Committee, N.C. Asthma Program

#### Strategies:

- 1) By September 2014, develop an asthma education curriculum for health professionals working with geriatric residents.
- 2) By October 2014, collaborate with AHEC and other partners to provide Continuation Education Units (CEUs) for the curriculum.
- 3) By November 2014, promote the newly developed asthma education curriculum for healthcare professionals working with geriatric residents during five different events/meetings/conferences.
- 4) By December 2014, start providing regional curriculum trainings and/or webinars utilizing the asthma education curriculum for health professionals working with geriatric residents.

**Objective 2:** By August 2017, increase the capacity to conduct home assessments throughout the state by training housing managers, social workers, case managers, nurses, and other non-traditional asthma care providers.

**Lead Partner:** Environmental Committee, Medical Management Committee, Education and Public Awareness Committee, N.C. Asthma Program

#### Strategies:

- 1) By August 2014, partner with state and local agencies working with asthma care and management providers, as well as housing managers, social workers, and case managers to promote the home assessments for individuals with asthma, especially children.
- 2) By December 2014, partner with 10 healthcare providers who are willing to provide home assessments as part of their asthma care and management service.
- 3) By March 2014, recruit 30 housing managers, social workers, case managers, nurses, and other non-traditional asthma care providers who are interested in receiving trainings on conducting home assessments as part of the asthma management model.
- 4) By August 2015, start providing train-the-trainer home assessment trainings to 10 healthcare

providers and 30 housing managers, social workers, case managers, nurses, and other non-traditional asthma care providers.

- 5) By August 2016, develop a report illustrating the effect of home assessments on asthma care and management.
- 6) By August 2017, present the findings of home assessments evaluation to key decision makers at two different events/meetings to promote identification and elimination of asthma triggers in homes.

**Objective 3: By December 2018, increase the number of educational materials available on asthma trigger management in various settings (e.g. schools, homes, multi-unit housing, etc.).**

**Lead Partner:** Environmental Committee, Education and Public Awareness Committee

### Strategies:

- a) By September 2013, collaborate with the N.C. TPCB to develop an educational material focused on the dangers of secondhand smoke exposure and its relationship to asthma.
- b) By December 2013, distribute “Legal Options for tenants Bothered by Secondhand smoke” brochure within the community and clinical providers.
- c) By December 2013, work with the N.C. TPCB to promote North Carolina’s smoke-free multi-unit housing website (smokefreehousing.com) with community partners during two different events/meetings.
- d) By August 2014, present and/or train 50 different representatives from various sectors such as housing, education, legal community, healthcare providers, social workers, etc. on asthma trigger management.
- e) By August 2014, develop for download one model local and targeted press release, three key messages related to asthma trigger management, and five different talking points to share with key decision makers.
- f) By September 2015, update the educational resources available on North Carolina Asthma Program’s website.
- g) By January 2016, partner with the Division of Air Quality (DAQ) to promote awareness of alternative actions available to reduce air pollution that may contribute to asthma exacerbations during two different events/meetings and two asthma trigger management educational materials.
- h) By September 2016, develop two specific educational materials focused on indoor asthma triggers (such as mold, pests, or pets).
- i) By September 2018, develop two specific educational materials focused on outdoor asthma triggers (such as pollen, car exhaust, or ozone).
- j) By December 2018, partner with DPI, N.C. Division of Public Health, N.C. Cooperative Extension, N.C. Division of Child Development, DAQ, Children’s Environmental Health Branch, Head Start, and other partners to distribute 200 copies of appropriate educational materials on asthma trigger management.
- k) Through December 2018, work with state and local media markets to promote earned public service announcements focused on asthma trigger management.
- l) Through December 2018, work with state and local partners to include asthma trigger management resources on their webpages.

**Objective 4:** By December 2018, increase the number of evidence-based resources available for environmental asthma triggers.

**Lead Partner:** Environmental Committee

**Strategies:**

- a) By June 2014, collaborate with other AANC committees to ensure the inclusion of evidence-based studies in their efforts to address asthma.
- b) By August 2014, promote enhancement of communication and dissemination between academics and stakeholders.
- c) By August 2015, develop a list of evidence-based environmental resources addressing asthma-related topics.
- d) By August 2015, disseminate the list of evidence-based environmental resources for asthma through North Carolina Asthma Program website and e-mail list serves.
- e) By December 2018, maintain updated list of research studies on Asthma Alliance website.

**Objective 5:** Through December 2018, improve the process of communication among local asthma coalitions, workgroups, community-based organizations, and statewide coalitions.

**Lead Partner:** Asthma Alliance Leadership Team, North Carolina Asthma Program

**Strategies:**

- a) By December 2013, enhance and re-launch the existing local coalition list serve.
- b) By August 2015, establish a strong social media and social marketing presence for asthma related community initiatives of North Carolina.
- c) By March 2017, utilize social marketing and social media, along with other traditional methods to promote asthma programs and community initiatives annually.
- d) Through December 2018, develop and distribute an annual asthma coalition newsletter.
- e) Through December 2018, plan and hold annual regional coalition meetings/workshops on topics of interest, including coalition building.
- f) Through December 2018, continue to coordinate and encourage, collaboration on activities and initiatives with other local coalitions and alliances.

## How We Will Sustain North Carolina's Asthma Initiatives

The North Carolina Asthma Plan was written as, and is intended to be, a living, working document.

The AANC meets quarterly to address the need for and effectiveness of asthma initiatives across our state. This statewide coalition represents individuals and organizations committed to reducing the burden of asthma in North Carolina. New members are continuously being recruited and are encouraged to become involved with this mutually beneficial opportunity. At least one AANC meeting yearly will be devoted to the review and evaluation of progress toward meeting the goals and objectives of the North Carolina Asthma Plan. The plan will be updated and re-released every three to five years.

North Carolina's recent efforts to build and strengthen local asthma coalitions across our state reinforce our commitment to partnerships and collaboration. Nearly half of North Carolina counties have formed, or are in the process of forming, local asthma coalitions or workgroups. With the support of the state asthma program, many of these groups are developing their own strategic plans for addressing asthma in their respective communities.

Finally, the N.C. Asthma Program is absolutely committed to sustaining the efforts put into the development of this plan. The program, under-staffed in 2012, now has a firmly established infrastructure through partnership efforts within the DPH Chronic Disease Section and is capable of providing top-level leadership on all concepts set forth in the plan.

North Carolina is very fortunate to have a wealth of asthma human resources available. Each of the goals and objectives included in this plan was collaboratively set, and North Carolina has every reason to anticipate that each of the goals and objectives in this plan will be collaboratively achieved, built upon, and sustained over time.

## Evaluation

In order to ensure that the *North Carolina Asthma Plan* is working and serving the purposes that its drafters intended, a comprehensive evaluation framework has been designed. The N.C. Asthma Program, in collaboration with the AANC, the Asthma Advisory Team, and other key stakeholders across the state, will conduct ongoing evaluations to assess the qualitative and quantitative success of the *North Carolina Asthma Plan*.

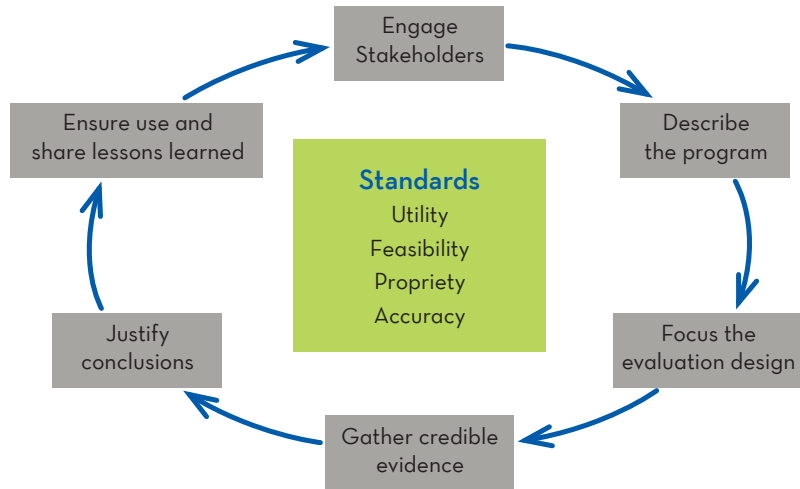


Figure 1: Framework for Program Evaluation in Public Health by CDC

Considering CDC’s *Framework for the Program Evaluation in Public Health* (See Figure 1), the *North Carolina Asthma Plan* is designed in a way that it will assist the N.C. Asthma Program and the AANC in conducting a thorough evaluation of the process and impact of achieving the proposed goals, objectives, and strategies.

In order to effectively evaluate goals and objectives, they must be specific, measurable, attainable, realistic, and time-bound (SMART). Therefore, the N.C. Asthma Program and the AANC facilitated our partners and stakeholders in developing objectives and strategies that are “SMART”. These SMART goals, objectives, and strategies will aid the N.C. Asthma Program and the AANC in reducing the burden of asthma in North Carolina, while helping to evaluate the process and impact of the *North Carolina Asthma Plan* itself.

Our partners and stakeholders are key to the success of the *North Carolina Asthma Plan*, and gaining their buy-in is critical. Therefore, stakeholders will play an integral role in evaluating the *North Carolina Asthma Plan* at all stages of implementation and help us evaluate the impact of the *North Carolina Asthma Plan*.

One way of engaging our stakeholders in evaluation of the *North Carolina Asthma Plan* will be to devote one of the AANC, our largest stakeholder group and statewide coalition, each year to review the progress made towards reaching the proposed goals, objectives, and strategies. During this meeting, the N.C. Asthma Program Evaluator will serve as the facilitator and guide the Alliance members and committee chairs in evaluating the goals, objectives, and strategies to be accomplished during that particular timeframe. AANC committee chairs will be particularly instrumental in taking

lead roles in helping to evaluate their particular sections of the plan during this meeting. The committee chairs will conduct a mini-exercise with their members to gather progress and feedback on the goals, objectives, and strategies in their sections. The committee chairs will then report this information to the N.C. Asthma Program Evaluator, who will in turn review and analyze the feedback. The N.C. Program Evaluator will work with each committee chair and AANC co-chairs to generate a progress report that will be presented to all AANC members and stakeholders.

Additionally, throughout the year, the committee chairs and AANC members will work with the N.C. Asthma Program Manager and Evaluator to monitor progress towards the completion of initiatives outlined within their respective committee sections. They will also work to restructure and/or revisit the goals, objectives and strategies in their sections, when necessary.

Local Asthma Coalitions will also be asked to provide their input on the progress made towards achieving the proposed goals, objectives, and strategies. It is important to include local asthma coalitions in evaluating the *North Carolina Asthma Plan* because they will be helping with the implementation of the strategies and activities to meet the goals and objectives. The N.C. Asthma Program Manager and Evaluator will work with the local coalitions and the AANC to develop a monitoring tool to collect feedback from local asthma coalitions.

In addition to annual reviews of this plan by the AANC and local coalitions, an electronic feedback tool will be posted on the N.C. Asthma Program's website. This tool will be used by constituents and stakeholders who review the plan electronically and are not necessary part of the Asthma Alliance or local coalitions. The N.C. Asthma Program Evaluator will review the results from the electronic feedback form and provide recommendations for any necessary adjustments or improvements to plan activities.

During the first year of implementation, the N.C. Program Evaluator will work with AANC co-chairs, committee chairs, and Asthma Advisory Team (AAT) to develop evaluation tools that could be used to evaluate the progress made towards the North Carolina Asthma Plan. These tools will equip the AANC co-chairs, committee chairs, and the N.C. Program Evaluator with adequate resources and mechanisms to determine the progress, success, achievements, as well as barriers/gaps that needs to be addressed.

Over the years, the stakeholders and partners will play an integral role in conducting impact evaluation of the *North Carolina Asthma Plan*. Based on available resources, the N.C. Program Evaluator and Epidemiologist will work with key partners and stakeholders to conduct evaluation studies to better understand the impact of achieving the *North Carolina Asthma Plan* goals and objectives has on the burden of asthma. For example, a study looking at the effect of conducting educational curriculum and trainings on asthma management can be conducted. To get a better understanding of how the proposed *North Carolina Asthma Plan* goals and objectives will help address the burden of asthma in North Carolina, please review the logic model in Figure 2.

*The North Carolina Asthma Plan 2013-2018* is a working document; therefore, the evaluation plan described here can be altered as needed. Furthermore, there are several strategies in the plan that

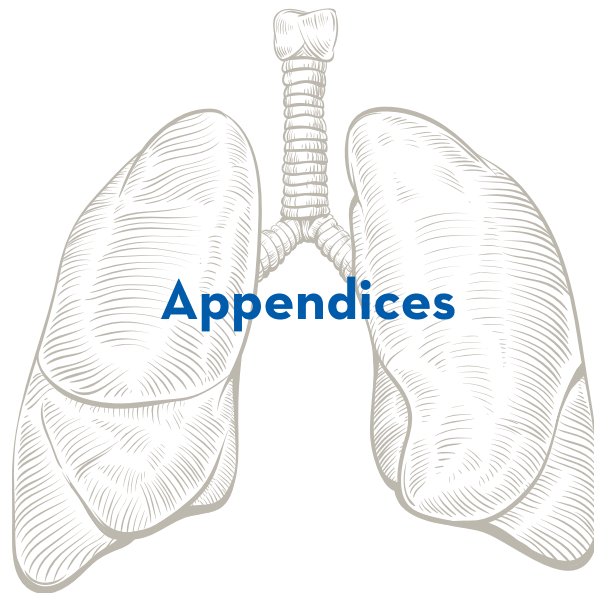
do not have baseline data available, so these strategies and goals may change as more data becomes available. Additionally, even though process and evaluation of the *North Carolina Asthma Plan* will be a priority for the N.C. Program and the AANC, the evaluation activities described here may be updated based on funding availability.



Figure 2. Logic Model for the North Carolina Asthma Plan

Resources/Inputs	Activities	Outputs	Short-Term/Intermediate Outcomes	Long-Term Impact
North Carolina Asthma Plan	AANC meetings	# of committees formed	Increased asthma education in schools, child care facilities, and health care facilities	Reduced mortality and morbidity due to asthma
Endorsement from Asthma Alliance of North Carolina (AANC) and NC DPH	AANC committee meetings	# of goals and objectives developed	Recommended school asthma action plan adopted	Reduced burden of asthma in NC
Dedicated NC Asthma Program staff	North Carolina Asthma Plan facilitated workshops	# of goals and objectives completed	Increased number of patients and providers utilizing asthma action plans	Increased quality of life for individuals with asthma in NC and their families
Committed volunteers and asthma stakeholders	Develop strong infrastructure to address asthma in NC	Copies of plan distributed	Increase asthma trigger management	Reduced asthma-related health disparities
Statewide asthma coalition – AANC members	Develop Plan priorities, goals, objectives, and strategies	# of AANC meeting participants	Increased access to quality asthma healthcare	
Funding	Collaborate with asthma stakeholders to implement strategies reflected in the Plan	# of Asthma Summit participants	Reduction in asthma related ED visits	
Local Asthma Coalitions and Representatives	Form committees to address the following plan sections: Education and Public Awareness; Environment; Medical Management; Surveillance; Policy; and Health Disparities	# of individuals trained in curriculum practices	Reduction in asthma related hospitalizations	
North Carolina Asthma Plan Committees	Strengthen and support community-based asthma initiatives	# of asthma patients and families who receive asthma action plans		
	Evaluate asthma initiatives	# of trainings and workshops held # of asthma activities completed # of educational resources disseminated		







## Appendix 1: Acronyms

AAE	Association of Asthma Educators
AANC	Asthma Alliance of North Carolina
AARC	American Association for Respiratory Care
ALANC	American Lung Association of North Carolina
CCNC	Community Care of North Carolina
CDC	Centers for Disease Control and Prevention
CTG	Community Transformation Grant
GINA	Global Initiative for Asthma
HUD	Department of Housing and Urban Development
IPIP	Improving Performance in Practice
LHA	Local Housing Authority
NAECB	National Asthma Educator Certification Board
NAEPP	National Asthma Education and Prevention Program
NBRC	National Board for Respiratory Care
N.C. AHEC	North Carolina Area Health Education Centers Program
N.C. BRFS	North Carolina Behavioral Risk Factor Surveillance Survey
N.C. CHAMP	North Carolina Child Health Assessment and Monitoring Program
N.C. DHHS	North Carolina Department of Health and Human Services
N.C. DPH	North Carolina Division of Public Health
N.C. DPI	North Carolina Department of Public Instruction
N.C. IOM	North Carolina Institute of Medicine
N.C. TPCB	North Carolina Tobacco Prevention and Control Branch
N.C. YRBS	North Carolina Youth Risk Behavior Survey
NHLBI	National Heart, Lung, and Blood Institute
NIH	National Institute of Health
NRTC	National Respiratory Training Center
OMH	Office of Minority Health and Health Disparities
SHS	Secondhand Smoke
WIC	Women, Infants, and Children



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State of North Carolina | Pat McCrory, Governor  
Department of Health and Human Services | Aldona Z. Wos, M.D., Secretary  
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