FINAL NARRATIVE REPORT

FOR THE GRANT AGREEMENT BETWEEN

DISTRICT OF COLUMBIA GOVERNMENT

DEPARTMENT OF HEALTH (DOH)

MATERNAL AND PRIMARY CARE ADMINISTRATION

BUREAU OF CANCER AND CHRONIC DISEASE PREVENTION

ASTHMA CONTROL PROGRAM

DC CONTROL ASTHMA NOW (DC CAN)

AND

NATIONAL CAPITAL ASTHMA COALITION (NCAC)

ORDER NO. PO219981

TOTAL GRANT AWARD: $25,000

GRANT PERIOD: MAY 4, 2007 THROUGH AUGUST 31, 2007

OCTOBER 31, 2007

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I. INTRODUCTION

NCAC greatly appreciates the support and guidance provided by DC CAN for the start-up of this program. With additional technical expertise and support from many local community, government, and national partners, we now have established a coordinated *Collaborative Home Environmental Intervention Program* designed to lessen exposure to environmental triggers, educate individuals and families about environmental asthma management, and connect adults, children, and families to clinical and social resources.

This final report summarizes NCAC's activities for the May 4, 2007 to August 31, 2007 grant period toward the implementation of the *Collaborative Home Environmental Intervention Program* under DOH Purchase Order PO219981. It also includes a summary analysis of the data collected from the grant's start through September 30, 2007. Included with this report is the final grant financial report; community outreach and press materials from the Potomac Gardens Community Day on May 5, 2007; letters of support from partner organizations; the 88-page application accepted by the University of the District of Columbia (UDC) Institutional Review Board (IRB) for data collection and human subjects protection; and codebooks for six data-collection instruments. Further documentation of the activities summarized below is included in previously submitted invoices.

II. BACKGROUND

A. Program Questions

The program interventions are intended to reduce exposure to environmental triggers in the homes of children and adults with asthma, and to address the following questions:

1. Will a relatively low-cost, uncomplicated intervention to reduce exposure to environmental asthma triggers improve the quality of life for the participants?
2. Will conducting an in-home asthma education program increase the availability of written asthma action plans?
3. Will this intervention result in the participant, or participant's caregiver(s), taking one or more additional steps to lessen the participant's exposure to environmental asthma triggers?

B. Program Objectives

The objectives of this grant are to:

1. Identify 30 target households for intervention.
2. Serve a minimum of 20 families with at least one home visit.
3. Facilitate a 25% increase in the number of program participants who have a written asthma action plan by the end of the program.
4. Determine that 50% or more of the program participants have taken at least one action step to reduce their exposure to environmental triggers after receiving the initial home visit.

C. Consultative Process

Before embarking on this endeavor, NCAC engaged 16 environmental specialists from collaborating organizations in a two-hour Environment Committee meeting on January 18, 2007 to provide input into the program's shared objectives and data-collection strategies. Participants emphasized the importance of documenting the collaboration process as we bring together diverse organizations to pool their resources and to coordinate their work with families. They particularly noted the complexity of interweaving home environmental projects that have separate objectives (pest management, lead, asthma, radon, safety, etc.), target areas and populations, and IRB-approved checklists, tools, and evaluation strategies. Moreover, they strongly advocated for the ongoing documentation of the nature and scope of the environmental health hazards and problems faced by the families that we serve. This evidence will be important as we develop recommendations for sustainability and policy change.

In addition, the partners discussed the importance of SMART (i.e., Specific, Measurable, Achievable, Reasonable, and Time-sensitive) outcome measures that would enable us to evaluate the program's impact, particularly on quality of life and health outcomes for individuals with asthma. Due to the highly seasonal nature of asthma morbidity – with peaks in emergency department visits and hospitalizations occurring each fall and spring – the partners expressed caution in interpreting the meaning of these measures in evaluating impact over the short term (i.e., less than at least a 12-month time span). Moreover, they added, as the program increases respondents' awareness of how asthma symptoms negatively impact their lives, quality of life scores may actually worsen even if the intervention is successful in improving asthma control.

NCAC will continue to solicit technical expertise and feedback from these collaborating organizations concerning the process and outcomes of the initiative. In their letters of support, these organizations affirmed their commitments to this effort, including assisting NCAC in the development of policy recommendations based on the program findings.

D. Program Partners

To enhance the reach and scope of its program services, NCAC partnered with the UDC Nursing and Allied Health Respiratory Program and the UDC Cooperative Extension Service (UDC/CES). Elgloria Harrison, RRT, a faculty member of the UDC Nursing and Allied Health Respiratory Program, served as co-principal investigator on the UDC IRB submission with Lisa A. Gilmore, NCAC. In addition, David Jefferson, principal investigator for UDC/CES' *Integrated Pest Management (IPM) for the Sustained Reduction of Pest Population in Low-Income Urban Residences in the District of Columbia* (UDC IRB Approval # 06-006), a project funded by the U.S. Environmental Protection Agency (EPA), agreed to recruit households for NCAC's asthma home visits and to provide integrated pest management services to those households as indicated. As requested, the UDC IRB granted approval for coordination and data-sharing between the IPM and asthma in-home projects. To facilitate comparisons between the two projects, the Environmental Management Follow-Up Survey employed by the *Collaborative Home Environmental Intervention Program* is adopted from the *Year-End Pest Management Survey* developed by the UDC/CES IPM Project.

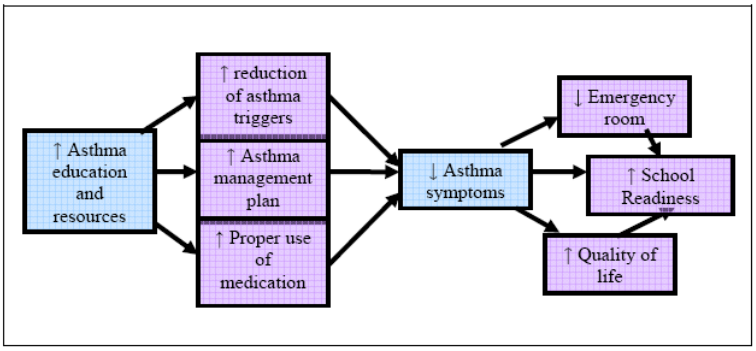
Our partnership with the two UDC programs has yielded several important benefits. In addition to the individuals recruited by the UDC/CES IPM Project for the asthma in-home environmental assessment and education program and the referrals made from the asthma program to the IPM Project for services, we utilized the Potomac Gardens' resident hired and trained by the UDC/CES IPM Project to conduct a subsequent home visit with the households participating in the asthma program. That individual delivered to four of the six households a refurbished high-efficiency particulate air (HEPA) vacuum provided by NCAC through a donation from ProTeam and trained program participants on its use. The other two enrolled households already had available their own vacuums. The Asthma Consultant followed up with additional home visits and telephone calls to check on participants' progress and to provide further services and resources as needed.

Second, the two projects jointly conducted an asthma and IPM workshop for Potomac Gardens' residents on August 14, 2007, enabling the residents to learn about the offered services firsthand. Finally, this partnership enabled us to more effectively engage the Potomac Gardens' two residents' councils, private management company, DC Housing Authority and EPA's Office of Pesticide Programs as collaborative partners in the asthma program. Together, we organized Potomac Garden's first annual Community Day with asthma screenings and other services for approximately 200 Potomac Gardens' residents, featured the asthma in-home program in an EPA press brief, and received the no-cost use of an empty apartment onsite to store supplies and to conduct additional workshops.

E. Program Limitations

Despite the program's achievements in leveraging partner resources and donated supplies, the lack of an ongoing funding commitment remains a major constraint for the program's continued success. In addition, the grant's short time frame – fewer than four months from start to finish – was insufficient to allow for a robust pre/post analysis of the program's impact (Figure 1). Moreover, as is true for other asthma home visiting programs, repeated attempts had to be made to recruit and make contact with interested individuals. Even when the Asthma Consultant had a scheduled appointment, no shows on the first one or two attempts to enter the home were common. Nevertheless, the program did accomplish between two and four home visits for every household it enrolled in the program.

Figure 1: Asthma Education: Outcome Variables and Their Relationship to the Child's Health, Quality of Life, and School Readiness



Source: *Asthma program manual: A comprehensive guide to planning a program for prevention and treatment of asthma in children under five*. Childhood Asthma Initiative. California Department of Health Services: Children's Medical Services Branch, Chronic Disease and Injury Control Branch, Environmental Health Investigations Branch. September 2005: 31. Available at http://www.dhs.ca.gov/ps/cdic/caphi/documents/Final%20--%20Asthma%20Program%20Manual.pdf.

III. PROGRAM ACTIVITIES

NCAC's *Collaborative Home Environmental Intervention Program* got off to a fast start. By May 5, 2007, the day after NCAC had received and signed the grant agreement, NCAC coordinated a health fair with asthma screenings and other services at Potomac Gardens Apartments, a public housing community at 700 12th Street, SE, Washington, DC (Ward 6), home to more than 600 families and seniors. Through NCAC's work on this event, we secured the cooperation of Potomac Gardens' management and its two residents' councils to serve as the primary program intervention site and recruited a registered respiratory therapist who also is an experienced educator to conduct the home interventions.

At the request of DC CAN and its Steering Committee, NCAC also expanded the program's evaluation design. NCAC requested and received permission from Elizabeth Juniper, MCSP MSc, to use her validated surveys in the evaluation. It took an additional request and several more weeks, however, to receive all of the requested survey packets by Federal Express from West Sussex, UK. **Further, the evaluation design required NCAC to obtain approval from an Institutional Review Board before any recruitment or home visits could begin.** With substantial concentrated effort over a couple of weeks, NCAC collaborated with program partners, conducted a literature review, created five study questionnaires and a home visit tracking form, and submitted an 88-page application on June 18, 2007 to the IRB at the University of the District of Columbia.

On July 16, 2007, NCAC received a copy of the approval letter from the UDC IRB which had approved NCAC's research protocol and consent form through an expedited review process without any changes. With the IRB approval now in effect for the period July 10, 2007 through July 10, 2008, NCAC moved quickly to launch the home visits:

- NCAC added the IRB number (#06-017) to the consent forms and surveys and printed and assembled packets of materials for the home visits.

- NCAC gave the go-ahead for the UDC/CES IPM Project to recruit interested families for NCAC's asthma home visits. Recruitment expanded when Potomac Gardens Apartments' management permitted both the IPM and asthma projects to conduct more extensive outreach with all (consenting) residents in Building 700.

- With the return of the program's Asthma Consultant, Elgloria Harrison, RRT, on August 6, 2007 from a 1.5-week vacation, the program began to contact families to obtain consent for home visits and to administer baseline surveys.

- In addition, Dr. Rhonique Shields-Harris, Children's Health Project, Children's National Medical Center (CNMC) volunteered to recruit families for NCAC's home visits and enlisted her physician colleagues at CNMC to do the same.

- To further assist in recruitment, the NCAC and UDC co-principal investigators designed a recruitment flyer, physician referral form, and physician feedback form and obtained UDC IRB approval.

- In late July, Potomac Gardens gave the UDC and NCAC projects the no-cost use of an empty apartment onsite to store supplies and to conduct workshops.

IV. WORK PLAN ACCOMPLISHMENTS

The following table summarizes the program activities and milestones for the entire grant period between May 4, 2007 and August 31, 2007:

Week	Completed Work Plan Activities for May 4, 2007 through August 31, 2007
1	• Coordinated exhibitors and co-hosted health fair (with asthma spirometer screenings and counseling) on May 5, 2007 with two Potomac Gardens Residents Councils at 1st Annual Potomac Gardens Community Day, 700 12th Street, SE, Washington, DC. Event attended by an estimated 200 Potomac Gardens residents. • Coordinated press brief released on May 5, 2007 by the U.S. Environmental Protection Agency (EPA) announcing the Potomac Gardens' launch of NCAC's DOH-funded home visiting program jointly with the EPA-funded Integrated Pest Management (IPM) Project led by the University of the District of Columbia Cooperative Extension Service (UDC/CES). • Recruited Elgloria Harrison, Registered Respiratory Therapist, as Asthma Consultant to conduct home asthma visits. • Met with Asthma Consultant on May 11, 2007 to discuss subcontract, intervention protocols, and evaluation requirements.
2	• Participated in conduct of *Integrated Pest Management and Asthma Workshop* on May 14, 2007 for the Potomac Gardens Senior Residents Council at Potomac Gardens Apartments. • Met on May 18, 2007 with Asthma Consultant and with David Jefferson, UDC/CES, regarding joint protocols for asthma and IPM home visits at Potomac Gardens. • Obtained approval from Elizabeth Juniper, MCSP MSc, West Sussex, UK for use of her Asthma Quality of Life Questionnaire and Asthma Control Questionnaire.
3-4	• Researched, downloaded, and assembled large binder with Institutional Review Board (IRB) requirements, validated surveys, educational materials, etc. • Submitted above materials to Elgloria Harrison, Asthma Consultant, who completed a portion of URB IRB application as co-principal investigator.
5	• Completed NCI Human Subjects Protection Training required for University of the District of Columbia (UDC) Institutional Review Board application (completed on May 25, 2007 by Elgloria Harrison, Asthma Consultant, and completed on June 9, 2007 by Lisa A. Gilmore, NCAC.)
6	• Developed data collection instruments, including a client contact sheet; environmental assessment tools; asthma management and quality of life surveys for adults, parents/caregivers, and children; and a home visit tracking form. • Completed 88-page UDC IRB application with data safeguarding plan.
7	• Submitted UDC IRB application and confirmed its receipt. • Participated in two-hour DC CAN Environmental Committee Working Group session including discussion of NCAC home visits and other interventions.

Week	Completed Work Plan Activities for May 4, 2007 through August 31, 2007
8	• Submitted requests for donated cleaning and storage items for Family Start-Up Kits.
9	• Participated in Coalition for Environmental Safe Communities' Environmental Health Collaborative Planning Meeting and recruited additional partners for program.
10	• Submitted order for several EPA educational publications for home asthma visits.
11	• Received letter of approval from UDC IRB (# 06-017) to begin program.
12	• Confirmed program start-up with Dr. Samuel Little, Director, Resident Services, DC Housing Authority. • Printed and assembled 30^{+} copies of each survey, educational materials, etc. • Received pledge from Children's National Medical Center to recruit families. • Drafted recruitment flyer, physician referral form, and physician feedback form. • Submitted order for program supplies (files, binders, rolling crate, etc.) • Asked UDC/CES' IPM Project to contact families it had previously identified as potentially interested in asthma home visits. • Awaited return of Asthma Consultant (on vacation from July 25-August 3, 2007)
13	• Revised recruitment flyer, physician referral form, and physician feedback form and sent to Asthma Consultant for review upon her return from vacation. • Developed model apartment loaned by Potomac Gardens' management to the UDC and NCAC programs as a demonstration site.
14	• Submitted Narrative Report for the period May 4, 2007 through July 31, 2007 and revised budget to Edwina Davis-Robinson, DC CAN, DOH on August 5, 2007. • Ordered program supplies to meet requirements of evaluation (e.g., locked file cabinet for data safeguarding) and intervention (e.g., paper and toner to print education materials for individual/family Asthma Resource Kits). • Sent recruitment forms (flyer, physician referral form, and physician feedback form) to Performance Improvement Department at Children's National Medical Center (CNMC) for review regarding HIPAA compliance and appropriate patient privacy. CNMC's HIPAA expert endorsed forms on August 10, 2007. • Submitted recruitment forms to University of the District of Columbia Institutional Review Board on August 11, 2007 for official approval.
15	• Presented asthma workshop on August 14, 2007 at meeting of the Potomac Gardens Residents Council attended by 13 residents. • Sent final IRB-approved recruitment forms on August 17, 2007 to physicians at Children's National Medical Center (Dr. Rhonique Shields-Harris, Dr. Consuela Hunt, Dr. Kelly D. Stone) to assist in recruiting households for intervention. • Met with Elgloria Harrison, RRT (Asthma Consultant) on August 18, 2007 regarding recruitment forms and protocols. • Posted recruitment flyer and circulated recruitment flyer to residents on August 18, 2007 in cooperation with Potomac Gardens' management.

Week	Completed Work Plan Activities for May 4, 2007 through August 31, 2007
16	• Met on August 28, 2007 with Trudy Perry, MA, Resolution Dynamics, Inc. (Evaluator) and Elgloria Harrison, RRT (Asthma Consultant) to discuss evaluation process and requirements.
17	• Conducted telephone meeting on August 28, 2007 with Dr. Samuel Little, Director of Resident Services, DC Housing Authority, regarding home visits at Potomac Gardens Apartments. • Continued recruitment, home visits, and data collection activities.
Ongoing	• Provided program supplies to Asthma Consultant for use with families, including donated refurbished HEPA vacuums, asthma kits with dust mite-impermeable pillow and mattress encasings and other resources, and patient education materials. • Conducted program administration and oversight activities. • Coordinated with Integrated Pest Management Project at Potomac Gardens through regular communication with David Jefferson, University of the District of Columbia Cooperative Extension Service, and Kathy Seikel, Office of Pesticide Programs, U.S. Environmental Protection Agency.

V. GRANT RESULTS

The following table summarizes the grant objectives and results through September 30, 2007. Despite the cooperation of Potomac Gardens' two residents councils and management company and the multiple recruitment strategies employed by both the asthma and IPM projects (e.g., multiple onsite resident workshops, flyers distributed to residents, knocking on doors, and repeated follow up with potential recruits), identification of target households remained a significant challenge. Some individuals who had self-identified as having asthma or breathing problems turned out not to have asthma. In addition, a good portion of the interested residents initially identified through the UDC/CES IPM Project no longer had working telephones by the time we followed up with them, sometimes just days or a couple of weeks later. For those individuals who could be contacted and who agreed to participate in the home visits, repeated no shows were common, and in two cases, were insurmountable.

To maximize program participation, the Asthma Consultant maintained a non-judgmental stance, made repeated attempts to initiate contact and to reschedule appointments, and conducted the home visits during day, evening, and weekend hours for the convenience of the participants. The program conducted the first baseline visit on August 16, 2007 and the last baseline visit on September 20, 2007. During this reporting period, the program conducted a follow-up environmental survey on one household and no follow-up surveys of asthma management and quality of life. As resources and participants allow, subsequent home visits will be used to collect comparative data at regular intervals.

Nonetheless, the program home visit tracking forms enabled us to observe and report signs of progress among program participants from the baseline assessment. The baseline data also offer initial insights into asthma management issues faced by the target population.

A. Grant Objectives and Results

Grant Objectives	Results for May 4, 2007 – September 30, 2007	#
1. Identify 30 target households for intervention.	**Total identified target households for intervention.**	**16**
	Number of Potomac Gardens' residents from August 14, 2007 workshop who requested asthma home visits (out of total of 13 workshop attendees)	6
	Number of Potomac Gardens' residents identified as potential recruits for asthma home visits (i.e., self-indicated as having "asthma or breathing problems") through UDC IPM Project.	8
	Number of households referred for asthma home visits via two Children's National Medical Center M.D.s.	2
2. Serve a minimum of 20 families with at least one home visit.	**Total number of households that received at least one home visit.**	**6**
	Number of identified households that did not have asthma diagnosis and did not participate for this reason.	3
	Number of identified households who could not be reached (e.g., phone disconnected).	5
	Number of identified households reached but who declined to participate.	0
	Number of permanent "no shows" after home visits scheduled.	2
3. Facilitate a 25% increase in the number of program participants who have a written asthma action plan by the end of the program.	Percentage increase in number of program participants who have a written asthma action plan by the end of the program.	300%
	Number of program participants with written asthma action plan at baseline.	1
	Number of program participants with written asthma action plan at subsequent contact.	4
	Number of households that received at least one blank DC Asthma Action Plan form at initial home visit	6 of 6 100%
4. Determine that 50% or more of the program participants have taken at least one action step to reduce their exposure to environmental triggers after receiving the initial home visit.	Percentage of program participants that have taken at least one action step to reduce their exposure to environmental triggers after receiving the initial home visit (= number of households that have taken at least one environmental action step after initial home visit divided by total number of participating households)	100%

B. Baseline Interventions

The program employed a Home Visit Tracking Form to document the core education messages, technique skills-building, environmental interventions, education materials, and facilitation to services provided by the Asthma Consultant to program participants. Of the six households that participated in an initial home visit, the table below describes how many of the households received each of these services and resources.

Collaborative Home Environmental Intervention Program
Home Visit Tracking Form – Baseline Summary (N = 6 households)
May 4, 2007 – September 30, 2007

CORE ASTHMA EDUCATION MESSAGES:	(# HH)	DEALING WITH ASTHMA TRIGGERS:	(# HH)	EDUCATION MATERIALS PROVIDED:	(# HH)
Asthma is a chronic disease	6	Viral Infections (colds, flu)	3	Breathing Freely: Controlling Asthma Triggers Video	5
Asthma can be controlled	6	Pollen	0	Clear Your Home of Asthma Triggers Brochure	4
Know your/your child's asthma triggers	5	Tobacco Smoke	1	Clearing the Air: 10 Steps…Your Home Asthma-Friendly	5
Know asthma attack warning signs	6	Dust Mites	2	Dusty the Asthma Goldfish & His Asthma Triggers Funbook	5
Controller vs. quick relief medicines	6	Pests (cockroaches, rats, mice, etc.)	2	Help Your Child Gain Control Over Asthma	2
Written asthma management plan	6	Pets (e.g., cats and dogs)	0	A Brief Guide to Mold, Moisture, and Your Home	3
Goals of asthma treatment	6	Moisture/Mold	0	Safe Control: Cockroaches & Rodents, Using IPM in… 'Hood	2
See physician regularly for asthma care	6	Exercise	0	Environmental Resource Guide for the District of Columbia	4
How to talk to your physician	6	Strong Odors	0	The Partnership for Prescription Assistance Brochure	1
Other: _____		Weather/Season	0	Rx4DC Brochure	2
Other: _____		Other:_____		UDC Rodent/Roach Pest Control Fact Sheet	1
				Help Yourself to a Healthy Home (Alabama CES)	2
TECHNIQUE-MEDICATIONS/ DEVICES:	**(# HH)**	**ENVIRONMENTAL INTERVENTIONS:**	**(# HH)**		
Peak Flow Meter	5	Start-Up Kit Provided	4	Asthma Booklet (with Asthma Control Test™)	6
				Smoking Cessation Programs Resource List	2
Dry Powder Inhaler	1	HEPA Vacuum Provided	4	Secondhand Tobacco Smoke/Health of Your Family Brochure	6
Metered Dose Inhaler, Propellant Type	4	Asthma Kit (with bedding) Provided	6	Smoke-Free Home Pledge Card	0
Spacer	2	Cleaning Supplies Provided	0	Keep Your Home and Car Smoke-Free Placemat	2
Nebulizer	2	Clutter, Stuffed Toys Removed	1	Other: no smoking sign on door "O_2 in use"	1
Diskus Inhaler	0	Food Put Away (containers, fridge)	4	Other: blank DC Asthma Action Plans given to HH	6
Nasal Spray	0	Mold Removed	0		
		Changed Window Treatments	0	**SMOKE-FREE HOMES PLEDGE SIGNED?** ☐ **YES** ☒ 6 **NO**	
Other:_____		Removed Carpet	0		
NOTES:		Fixed Plumbing Problem	0	**FACILITATED LINKAGES TO SERVICES:**	**(# HH)**
		Referred for Integrated Pest Mgmt.	3	Primary Care Physician or Allergist	2
		Air Cleaner	0	Tobacco Cessation: 1-800-QUIT-NOW DC quit line	1
		Dehumidifier	0	Social Services:_____	
		Other: kitchen ware	1	Legal Services:_____	
		Other: storage bin		Other: helped make appt. with pulmonary M.D.	1

C. Baseline Data Collection

1. EPA Asthma Home Environment Checklist

The program employed the EPA *Asthma Home Environment Checklist* during each of the six initial home visits. The checklist, designed for home care visitors, "…provides a list of questions and action steps to assist in the identification and mitigation of environmental asthma triggers commonly found in and around the home." It also afforded the Asthma Consultant the opportunity to encourage participants to reduce common indoor asthma triggers, particularly in bedrooms and other commonly used areas, and to recommend relatively low-cost interventions to reduce exposure to asthma triggers, such as clearing clutter, removing stuffed toys, keeping food in sealed containers, vacuuming, using mattress and pillow encasings, quitting smoking, and not allowing smoking in the home.

Collaborative Home Environmental Intervention Program EPA Asthma Home Environment Checklist – Baseline Summary May 4, 2007 – September 30, 2007	
Total households surveyed	6 households
Time for administration	Average = 19 minutes; Range = 15 minutes – 30 minutes
Type of administration	Observation and interview by Asthma Consultant
Type of building (own or rent?)	6 of 6 households lived in rented apartments
Smoking in the home	Smoking reported in 4 out of 6 households. Notes: "Mother smokes, says she only smokes in her bedroom and not around children." "Significant other smokes." "Mother smokes - indicated that children's M.D. has spoken with her about smoking." "Patient/client smokes."
Pets	At least 2 households had cats but with no reports of worsening asthma around warm-blooded pets; only 1 household reported warm-blooded pets as asthma trigger
Chemicals or strong odors	4 of 6 households reported worse asthma when around chemicals or products with strong odors
Types of floor covering	1 household with carpeting, 2 households with throw rugs, 3 households with neither carpets nor rugs
Upholstered furniture	Upholstered furniture was present in 5 of 6 households
Window coverings	4 of 6 households had curtains or drapes
Gas cooking appliances	All 6 households had gas cooking appliances [program did not measure fumes or gas emissions]
Evidence of water damage, moisture, leaks, mold or mildew	Minimal evidence of mold and moisture. Moisture noted in 1 household and mold around tub in another household. No standing water found. No households with humidifiers
Cockroaches	Cockroaches found in 3 of the 6 households; referrals made to UDC/CES Integrated Pest Management Project
Food crumbs or unsealed food	Identified in 2 of 6 households

2. Adult Survey

The program surveyed four adult participants self-diagnosed with asthma. Of the Adult Survey's 55 questions, 15 questions are from the validated Mini Asthma Quality of Life Questionnaire© (MiniAQLQ) used with the permission of Elizabeth Juniper, MCSP, MSc. We reduced the recall period from one week to two weeks as permitted on the basis of the survey's validation studies. Four questions are from the Asthma Control Test™ (ACT) for ages 12 years and older, copyrighted by GlaxoSmithKline and trademarked by QualityMetric Incorporated. The program also adapted questions for both the Adult Survey and Parent/Caregiver Survey from the 2005 *California Health Interview Survey*, The Robert Wood Johnson Foundation *Allies Against Asthma's Asthma Core Caregiver Survey*, EPA's *The National Survey on Environmental Management of Asthma and Children's Exposure to Environmental Tobacco Smoke*, 2006 *Behavioral Risk Factor Surveillance Survey*, including Adult Asthma Survey, and *SLAITS National Asthma Survey National Sample – 2003*.

Among the main findings, the adult respondents appeared to minimize the impact of asthma on their quality of life. Despite mean scores from the MiniAQLQ indicating that all four adult respondents were suffering from moderate to severe impairments in quality of life due to asthma during the past week, two respondents rated their asthma during the past four weeks as somewhat controlled, one respondent reported his/her asthma as well controlled, and one respondent reported his/her asthma as completely controlled.

In addition, two respondents who reported in the ACT portion of the survey that their asthma was somewhat controlled and completely controlled, respectively, also reported that they had used their rescue inhaler or nebulizer medication (such as albuterol) three or more times a day during the past four weeks, a generally recognized sign that their asthma may not be under control. Consistent with the degree of impairment suggested by the MiniAQLQ, three of the four adults reported in the ACT portion of the survey that asthma kept them from getting as much done some, most, or all of the time.

Moreover, three of four respondents reported only five or fewer completely symptom-free days in the past two weeks, suggesting that they had experienced symptoms of asthma about two-thirds of the time during that same period. This finding may be the reason why three of four respondents indicated that their most important goal was to have fewer symptoms, such as wheezing, shortness of breath, tightness in the chest, or coughing.

The use of emergency care reported by respondents over the past 12 months suggests a high degree of asthma morbidity. Two of the four adults reported an overnight hospital stay because of an asthma problem and three of the four adults went to an emergency room because of an asthma problem. Over the same 12-month period, two adults reported being unable to work or carry out usual activities for 8-30 days because of their asthma.

When asked about asthma triggers, all four respondents were aware of at least one personal trigger. Dust mites and cockroaches were triggers for two of the four respondents.

Finally, the data suggest the need to reduce respondents' exposure to secondhand smoke. Two adults reported that secondhand smoke triggers their asthma. In addition, three of the four respondents indicated that smoking was allowed in their homes at least sometimes.

Collaborative Home Environmental Intervention Program Adult Survey – Baseline Summary May 4, 2007 – September 30, 2007	
Total adults surveyed	4 adult respondents
Time for administration	Average = 21 minutes; Range = 20 minutes – 24 minutes
Type of administration	2 self-administered, 2 face-to-face interview
Age of respondent	Average = 38.25 years; Ages = 45, 29, 31, and 48 years
Sex of respondent	3 = female, 1 = male
Race/ethnicity of respondent	4 of 4 respondents = Black or African American, non-Hispanic
Highest level of education	4 of 4 respondents reported high school or equivalent
Total family income before taxes last year	1 respondent = $15,001 - $20,000, 2 respondents = Less than $5,000, 1 respondent = Don't Know
Insurance	4 of 4 respondents reported health insurance coverage (United Healthcare, Amerigroup, DC Alliance, Chartered Health Plan)
Presence of asthma	4 or 4 respondents reported being told by a health professional that they had asthma and reported that they "still have asthma"
Written asthma plan	0 of 4 adults reported having a written asthma management plan
MiniAQLQ© (Quality of Life) On 7-point scale, 1.0 indicates severe impairment due to asthma; 4.0 indicates moderate degree of impairment due to asthma; 7.0 indicates no impairments due to asthma	Adult: 1, 2, 3, 4 Mean - Symptoms: 4.2, 3.0, 1.4, 4.2 Mean - Activity Limitations: 4.5, 4.8, 2.0, 4.0 Mean - Emotional Function: 2.3, 4.0, 2.3, 3.3 Mean - Environmental Stimuli: 3.3, 2.7, 3.0, 4.3 Mean - All Domains: 3.7, 3.6, 2.1, 4.0
Asthma Control Test™ "If ACT score is 19 or less, your asthma may not be controlled as well as it should be."	Adult: 1, 2, 3, 4 Score: 13, 16, 19, 17
Symptom-free days (past two weeks)	1 respondent = 12 days, 2 respondents = 5 days, 1 respondent = 3 days
Overnight hospital stay	1 of 4 respondents (4 weeks); 2 of 4 respondents (12 months)
Went to emergency room	1 of 4 respondents (4 weeks); 3 of 4 respondents (12 months)
Delayed/did not get asthma prescription ordered by M.D.	1 yes response because, "No prescription - new M.D."
Smoking in home	Allowed sometimes or always in 3 of 4 households
Personal asthma triggers	Secondhand smoke (2 of 4), dust mites (2 of 4), cockroaches (2 of 4), dust mites (1 of 4), mold (1 of 4), pets (1 of 4)
Other triggers (specify)	"spraying aerosols," "nothing," "dirt"

3. Parent/Caregiver Survey

The program surveyed five adult parents/caregivers of children identified by the respondents as having asthma. One respondent completed a survey for each of her two children and also completed an Adult Survey regarding her own asthma. Of the Parent/Caregiver Survey's 49 questions, 13 questions are from the validated Paediatric Asthma Caregiver's Quality of Life Questionnaire© used with the permission of Elizabeth Juniper, MCSP, MSc. We reduced the recall period from one week to two weeks as permitted on the basis of the survey's validation studies. As described above, the program adapted the remaining questions from existing state and national government surveys.

Among the key findings, parent/caregivers reported that four of the five children had been completely symptom-free in past two weeks. Their reports contrast with the experience of two of the three children who reported on the separate Mini Paediatric Asthma Quality of Life Questionnaire© (PAQLQ) that they had experienced some degree of moderate impairment in the last week due to their asthma (mean PAQLQ scores of 4.3 and 5.3, respectively, with 4.0 indicating moderate impairment on a seven-point scale).

Parent/caregivers reported that, during the past four weeks, two children had gone to the emergency room because of asthma and that one of these two children stayed overnight in the hospital because of asthma. The parent/caregiver of the hospitalized child reported significant disruption due to the child's asthma, stating that during the past four weeks, he/she was unable to work or carry out usual activities for 30 days.

Parent/caregivers also reported that, during the past 12 months, one child had gone to the emergency room because of asthma and that another child had stayed overnight in hospital (but not the same child previously reported as having a hospital stay in the past four weeks. One of the respondents inconsistently reported their child had a hospital stay in the past four weeks but not in the past 12 months, so it is unclear whether there were total of two or three children who had either gone to the emergency room or had an overnight hospital stay in the past year because of asthma.

Only one of the five parents/caregivers reported having a written plan for managing their child's asthma. They also reported that all five of the children had health insurance coverage (two children were covered by Amerigroup and three children were covered by Chartered Health Plan) and that none of the parents/caregivers had delayed or not gotten a prescription that a doctor ordered for their child's asthma during the past four weeks.

When asked about the most important goal for their child, three respondents selected, "To have no missed days of work or school," and two respondents chose, "To have fewer symptoms, such as wheezing, shortness of breath, tightness in the chest, or coughing."

Three of the five parents/caregivers reported that cockroaches were a trigger for the child's asthma. When asked the open-ended question, "What else triggers your child's asthma?" four the five parents selected "cold" or "colds" and one responded added "sinus, allergies."

All five parents/caregivers reported washing bedding in hot water weekly and two of five parents/caregivers use a pillow cover made especially for controlling dust mites. Only one in five parents/caregivers indicated that they regularly vacuum or clean their home.

Collaborative Home Environmental Intervention Program Parent/Caregiver Survey – Baseline Summary May 4, 2007 – September 30, 2007	
Total adults surveyed	5 parents/caregivers
Time for administration	Average = 23 minutes; 4 surveys administered in 15-20 minutes and 1 survey interviewer-administered in 50 minutes
Type of administration	2 self-administered, 3 face-to-face interview
Age of respondent	Average = 30.8 years; Ages = 20, 28, 29, 29, and 48 years
Sex of respondent	5 = female
Race/ethnicity of respondent	5 of 5 respondents = Black or African American, non-Hispanic
Highest level of education	5 of 5 respondents reported high school or equivalent
Total family income before taxes last year	2 respondents = Less than $5,000, 3 respondents = Don't Know
Age of child	Average = 10 years; Ages = 4, 6, 11, 12, and 17 years
Sex of child	2 = female, 3 = male
Race/ethnicity of child	5 of 5 = Black or African American, non-Hispanic
Child's insurance	5 of 5 respondents reported health insurance coverage for child (3 = Chartered Health Plan, 2 = Amerigroup)
Written asthma plan	1 of 5 reported having written asthma management plan for child
Caregiver Quality of Life On 7-point scale, 1.0 indicates severe impairment due to asthma; 4.0 indicates moderate degree of impairment due to asthma; 7.0 indicates no impairments due to asthma	Parent/ Caregiver: 1, 2, 3, 4, 5 Mean - Activity Limitations: 5.5, 3.5, 3.5, 1.0, 6.3 Mean - Emotional Function: 3.7, 6.4, 6.8, 6.3, 6.4 Mean - All Domains: 4.2, 5.5, 5.8, 4.7, 6.4
Symptom-free days (past two weeks)	4 respondents = 14 days, 1 respondent = 10 days
Overnight hospital stay	1 of 4 respondents (4 weeks); 1 of 4 respondents (12 months)
Went to emergency room	2 of 4 respondents (4 weeks); 1* of 4 respondents (12 months) * Inconsistent with 1 respondent's answer for ER @ 4 weeks
Delayed/did not get asthma prescription ordered by M.D.	5 of 5 respondents answered "no"
Child's asthma triggers	Cockroaches (3 of 5), secondhand smoke (1 of 5), dust mites (1 of 5), mold (1 of 5), pets (1 of 5)
Other triggers (specify)	"Cold/colds" identified as child's trigger by 4 of 5 respondents
Environmental steps	5 of 5 respondents wash bedding in hot water weekly; 2 of 5 use a pillow cover made especially for controlling dust mites; 1 in 5 regularly vacuum or clean home with damp cloth to remove dust

4. Mini Paediatric Asthma Quality of Life Questionnaire©

The program used the validated Mini Paediatric Asthma Quality of Life Questionnaire© with the permission of Elizabeth Juniper, MCSP, MSc. It asks questions in three domains – activity limitations, symptoms, and emotional function – and employs a one-week recall period The questionnaire is designed to be self-administered by children and youth ages 11-17 and to be interviewer administered for children ages 7-10. During this reporting period, two children self-administered the survey and a third child participated in the survey as an interview. Survey administration took an average of 18.3 minutes (20 minutes, 20 minutes, and 15 minutes, respectively.)

Collaborative Home Environmental Intervention Program
Mini Paediatric Asthma Quality of Life Questionnaire© – Baseline Summary
May 4, 2007 – September 30, 2007

Child	Activity Limitations	Symptoms	Emotional Function	All Domains
1	4.7	4.3	5.3	4.7
2	5.0	5.3	6.3	5.5
3	7.0	7.0	7.0	7.0

Interpretation of mean values on 7-point scale:

1.0 indicates severe impairment due to asthma

4.0 indicates moderate degree of impairment due to asthma

7.0 indicates no impairments due to asthma

D. Follow-Up Interventions

Between August 16, 2007 and September 25, 2007, all of the six households received between two and four asthma home visits. Two of the households received two home visits, three of the households received three home visits, and one of the households received four home visits. One of the six households subsequently received a fourth home visit on October 17, 2007. The visits followed the general outline for the first one to six weeks described in the program's IRB submission (see Table 1 below). Given the short time frame and our assessment of the current needs of program participants, however, we did not complete the first follow-up administration of surveys. The program completed one Environmental Management Follow-Up Survey during the reporting period.

At the initial in-home environmental assessment and asthma education session, the Asthma Consultant, a registered respiratory therapist, provided immediate education and assistance to program participants to empower them to take the next steps needed to improve their asthma management. For example, in the initial session, she provided one or more blank DC Asthma Action Plan forms to adults with asthma and to parents and caregivers of children with asthma in all six households to take with them to the next appointment with a healthcare practitioner. In one instance, she assisted one program participant to arrange a follow-up appointment by calling the pulmonologist's office. She also encouraged two program participants, respectively, to follow up with a primary care physician ("to get another asthma prescription") and with an allergist ("three children with asthma, no asthma action plans.") For those program participants with asthma medication and devices on hand, she reviewed and/or coached them on proper technique.

The Asthma Consultant determined additional next steps based on the requests and needs of the individuals and families identified during the initial session and/or in subsequent telephone contact(s). For example, she referred three households to the UDC/CES Integrated Pest Management Project for assistance in reducing cockroaches and other pests that she observed in the home. She also returned to several homes to provide plastic food containers so that food could be put away and not left out as food for pests. Furthermore, at the request of one mother, she purchased and delivered containers to store the child's clothes to reduce the clutter on the closet floor of a child with asthma. Another program participant asked the Asthma Educator to, "stop by to reinforce how to discuss the patient's asthma with physician."

The Asthma Consultant also coordinated with the Potomac Gardens' resident employed by the UDC/CES IPM Project to deliver to four of the six households a refurbished HEPA vacuum provided by NCAC through a donation from ProTeam, generally at the second home visit. This individual also trained program participants on how to use the vacuums, and in one instance, returned to one household at the request of the Asthma Consultant to fix a vacuum that was missing one part. In the majority of households, the Asthma Consultant followed up with a third home visit to check on the participant's progress and to provide additional services and resources as needed.

Table 1
Home Environmental Intervention and Education

Visit	Education	Intervention
1	• Pre-tests completed to establish baseline on asthma management and quality of life. • Additional information gathered via interaction with participant and observation regarding asthma management and control, environmental issues, and related needs. • Overview provided of what asthma is, how to recognize what things make the asthma worse, and what participant can do about them. • Common asthma triggers (cockroaches, dust mites, mold, pet dander, ETS) and avoidance techniques explained.	• Study procedures explained with any questions answered. • Consent and assent for minors forms signed or refused. • Home environmental assessment completed. • Participants receive "Start-Up Kit" with one or more large containers and/or shelving to store items and reduce clutter, sealable food containers, cleaning supplies, and trash bags along with verbal instructions. • Written educational materials supplied. • Referrals made as indicated (e.g., visit physician for assessment and asthma action plan, call tobacco quit line)
2 (3-6 weeks)	• Education from first visit reinforced. • Review of asthma medications and devices and written asthma management plan if available. • First administration of post-tests completed.	• HEPA vacuums and Asthma Kit (with bed encasings) provided with instructions for use. • Reinforcement of techniques to control pests and to reduce exposure to other allergens and irritants.
3^{+} (up to 1 year)	• In-depth review of asthma management. • Administration of 3-month, 9-month, and 12-month post-tests completed (at home visit or by telephone).	• Reinforcement of techniques to control pests and to reduce exposure to other allergens and irritants. • Additional referrals as indicated.

Note: Table adapted from U.S. Environmental Protection Agency. *Case study: Children's Hospital of Philadelphia (CHOP)*. Table 1. December 2002. Air and Radiation 6609J; EPA-402-F-02-035. Available at http://www.epa.gov/asthma/pdfs/chop.pdf.

VI. DISCUSSION

A. Program Questions

The small number of participating households and the condensed grant period clearly restrict our ability to draw conclusions concerning the three program questions we posed at the start, namely:

1. Will a relatively low-cost, uncomplicated intervention to reduce exposure to environmental asthma triggers improve the quality of life for the participants?

2. Will conducting an in-home asthma education program increase the availability of written asthma action plans?

3. Will this intervention result in the participant, or participant's caregiver(s), taking one or more additional steps to lessen the participant's exposure to environmental asthma triggers?

Based on initial observations during subsequent home visits, however, it appears that the program holds promise at least for increasing the availability of written asthma action plans, as recommended by the 2007 revised National Asthma Education and Prevention Program asthma management guidelines, and for encouraging participants to take additional steps to manage common asthma triggers. The degree to which the participants use the written asthma actions and employ the vacuums, dust-mite impermeable pillow and mattress encasings, or other strategies to reduce exposure to environmental asthma triggers remains unknown. During this reporting period, however, five of six households did take steps to put food away and one household also cleaned up the previously visible clutter. Three households utilized the pillow and mattress encasings that they had received from the program.

For the households surveyed in this start-up period, smoking in the home was allowed at least sometimes in the majority of the households and at least two of the mothers smoked in the home. Only one participant specifically banned smoking from the household. Another participant had received repeated counseling from her children's pediatrician but continued to smoke at home. Program participants received encouragement to quit smoking and/or to not smoke in the home, a resource list of smoking cessation programs, a smoking cessation booklet, and recommendations, as indicated, to call DC's 1-800-QUIT-NOW toll-free quit line.

Finally, the baseline data suggest that there is significant room for improvement in quality of life. The majority of program participants to date have experienced at least moderate impairments in asthma-related quality of life. Moreover, past-year emergency room visits and hospitalizations are not uncommon. It remains to be seen, however, whether the program interventions over time can generate improvements in these quality of life measures.