

**Final Report of EPA-funded IPM/Environmental Health Resident  
Advocate Education Training Program**

(Resident Advocate Environmental Education Program)

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Report to:

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## *Introduction*

The primary objective of the IPM/Environmental Health Resident Advocate Environmental Education Program was to provide training and practical field experience to residents of Public Housing Developments in the field of environmental health advocacy. The secondary objective was for our trainees to provide in-home, one-on-one environmental health advocacy to residents of Public Housing Developments. The environmental health advocacy training provided a resident-based Integrated Pest Management (IPM) Advocacy Program, which was then evaluated through application to families living in Public Housing in Boston, MA. The Environmental Protection Agency funding allowed our U.S. Department of Housing and Urban Development (HUD) funded Healthy Public Housing Initiatives (HPHI) to extend Environmental Health Advocacy in-home support to families who were not participating in the asthma intervention study. (See HPHI Fact Sheet in Appendix for further info on the HPHI project.)

Four individuals were trained and participated in the program which provided IPM advice and services to twenty-five families living in Boston Public Housing Developments. This report describes the training program and the IPM services provided. In this report, we will evaluate the approach of training public housing residents in Environmental Health and IPM to assist neighbors in reducing pests, allergens and other asthma triggers.

All participants trained as IPM/Environmental Health Resident Advocates were from the community workforce participating in the Healthy Public Housing Initiative Asthma study. These individuals received supplemental instruction in IPM practices. Integrated Pest Management (IPM) is a method used to control pests in an environmentally responsible manner that relies heavily on an understanding of the ecology of pests in the home. The program emphasizes monitoring pest activity, removal of pest's sources of food, water and shelter, and endorses only the safe, limited and focused use of pesticides by professional exterminators.

The participants were:

Laura Bradeen, Director of the West Broadway Tenant Task Force, South Boston  
Katya Castillo, Resident of the Old Colony Development, South Boston  
Damaris Cuello, Resident of Bromley-Heath Development, Jamaica Plain  
Katie Jenner, Resident of the West Broadway Development, South Boston  
Maximo Vasquez, Resident of Old Colony Development, South Boston

The IPM/EH Resident Advocate Environmental Education Program elements consisted of Seven Phases.

- Phase 1 Development of a resident-based in home IPM Training Program focusing on resident empowerment and in-home visits
- Phase 2 Training of IPM/Environmental Health Resident Advocates in IPM strategies by experts in Pest Management and Environmental Health.
- Phase 3 Limited pilot program in three HPHI homes
- Phase 4 Recruitment of new participants to receive in-home training.
- Phase 5 Community Meetings
- Phase 6 In-home visits
- Phase 7 Evaluation

***Program Summary***

Phase 1 Program Development

The development of a resident-based in-home IPM training program took place at the West Broadway Task Force. The development of the training and outreach program consisted of several meetings with the staff at the task force office, with community leaders, community health workers and the IPM/Environmental Health Resident Advocate Trainees.

In these meetings, tasks and methods for recruiting participants and conducting the home visits were developed. The final program was designed to provide resident families with an individually-tailored IPM education including: the products and application of the least toxic means of pest control, weekly pest monitoring for the duration of one month, and training for residents on asthma awareness and the relationship between environmental building conditions and asthma. Previously, IPM/Environmental Health Resident Advocate Trainees had been trained by the Boston Public Health Commission's Community Health Education Center (CHEC) program to perform community outreach under the HPHI resident workforce training program. Our Environmental Protection Agency (EPA) sponsored training supplemented the Community Health Education Center (CHEC) experiences with specific training on assessing the health implications of

housing conditions, and communicating this knowledge to fellow residents with guidance on mitigation.

Resident participation in IPM programs is often lacking because the outreach is limited and not directed to the residents' specific needs. Residents are often not aware of the services which the pest management contractor is under contract to provide or the responsibilities of the property manager. While it is management's responsibility to monitor pest contractor, establishing an effective partnership with residents can provide significant enhancement of their performance. It is in the property manager's best interest to take an active role in conveying IPM-training, procedures and responsibilities of management, pesticide applicators, and residents to all involved including managers, maintenance staff, contractors and residents. An ineffective partnership often results in residents receiving substandard or inadequate services from the pest contractor, and an increasing reliance on "street" or store-bought pesticides. When residents are not aware of what is required from the contractor, the contractor's failure to provide services is not reported to management. An effective IPM program would have residents who understand that a small amount of preparation before the contractor arrives can result in marked improvement in pesticide application and consequently, result in a reduction in the residents' use of more hazardous pesticides. If the pest infestation is successfully reduced, the amount of pesticides applied in their homes can be reduced or even eliminated. The IPM/Environmental Health Resident Advocate Trainees program sought to empower public housing residents without blaming them for the pest infestation. Approximately fifteen hours of meeting time was invested in developing the training and materials to be used. Advocates were asked to develop portions of the program on their own or in smaller groups and report their progress at weekly meetings. HPHI staff from the West Broadway Task Force supported this program development.

The six products from this phase were:

- 1 An IPM Pest Management Brochure, in English and Spanish.
- 2 A schedule of visits and activities to be preformed during each visit.
- 3 Required forms for record keeping
- 4 Development of a HEPA-vacuum loaner program
- 5 Identification of specific training needs
- 6 Recruitment strategies

Phase 2 IPM Training

IPM/Environmental Health Resident Advocates were trained in IPM strategies by Don Rivard, a pest management expert, Rivard Resources IPM, Waltham, MA, and Beatriz Viñas, the program manager from the Harvard School of Public Health. The training consisted of instruction in the life habits and biology of cockroaches, to understand better how to trap and eliminate them. Mr. Rivard also explained the various types of pesticides available and which were the least toxic.

As part of the IPM strategies the IPM/Environmental Health Resident Advocate trainees received instruction and assistance on reducing clutter by organizing household items in order to eliminate hiding places and habitats for roaches, mice and other household pests.

Phase 3 Program Pilot

The program was first piloted with three HPHI families participating in the asthma study. The purpose of the pilot was to get the help of the HPHI families to evaluate and comment on the program, and to provide advice on how to approach the sensitive issues of housekeeping and storage with residents. The IPM/Environmental Health Resident Advocate trainees had already developed relationships with the HPHI families; therefore they would be more willing to offer advice and constructive criticism.

Phase 4 Recruitment of new participants to receive in-home training.

As part of the program's goal, the IPM/Environmental Health Resident Advocates recruited some non-HPHI families. Recruitment and enrollment of families into the program began in July 2003 and ended in September 2003. The program enrolled 25 families. As part of the recruitment, the IPM/Environmental Health Resident Advocate posted flyers around the West Broadway Development. However, the IPM/Environmental Health Resident Advocates were not able to get a sufficient number of families recruited using these flyers. Recruitment was supplemented by a community meeting and many enrollees were by referral or "word of mouth".

Phase 5            Community Meetings

A community meeting was held on August 14, 2003 at the Condon School located at 200 D Street at the community room in which 9 residents attended. One of our IPM/Environmental Health Resident Advocate explained and presented the IPM in home training program. As a result of the community meeting, 5 residents signed up for the program and the IPM/Environmental Health Resident Advocates obtained 1 referral. In addition a recruitment table was set up at West Broadway Development Unity day celebration (September 6, 2003). Unity day is an annual development-wide fair held at each Boston Public Housing Development.

Phase 6            In-home visits

During the home visits, the IPM/Environmental Health Resident Advocates performed a visual inspection using a checklist to identify pest entry, grade of housekeeping and determine the need for home repairs. During the home visits, the IPM/Environmental Health Resident Advocates provided education to the participant on topics such as non-toxic IPM methods; instructions in better housekeeping and sanitation and garbage removal practices; least toxic supplies including cockroach monitors. The IPM/Environmental Health Resident Advocates provided assistance with organization and clutter reduction to the program participants.

During each visit, insect monitors were placed and recovered a week later. The IPM/Environmental Health Resident Advocates recorded where pests were and why the pest population was thriving. The in-home visits were conducted in English and Spanish.

Monitors were placed in seven standardized locations (two in the kitchen, one in the hallway closet, one in the bathroom and three in bedrooms). The specific location of each monitor for each household was entered on a pest monitoring form (See Cockroach Trap Placement Form and Cockroach Report Form), which was used to record the number and location of cockroaches. If repairs were required, the IPM/Environmental Health Resident Advocates helped the residents file Work Orders with Boston Housing Authority. The advocates also introduced the HEPA-vacuum loan program. The purpose of this lending service was to provide the residents with a safe way of vacuuming under furniture, inside kitchen cabinets, behind and under appliances and dressers and closets to

remove live roaches, roach droppings, eggs or bodies. (Cockroach allergens associated with these materials can exacerbate asthma).

During the third visit, the IPM/Environmental Health Resident Advocates explained the importance of scraping off old gel to reduce pest infestation, and reinforced and reminded families that if they are successful in reducing the pest infestation in their units, the amount of pesticide applied in their homes can be reduced or eliminated.

A necessary maintenance work order tracking form was developed. The purpose of the work order tracking form was both to educate the resident on the type of information the resident needs in order to properly follow-up on work orders and also to give the resident a place in which to record the needed information. We learned that maintenance work orders are often not filed by some residents because they have lost faith in the BHA's work order system since they were not satisfied on previous attempts. The work order tracking form was designed to improve functioning of the work order system, to help restore residents' faith in the work order system, and to empower the residents by informing them of what they should expect from management.

### ***Evaluation***

In order to evaluate the effectiveness of the program, an evaluation form was developed as part of phase 1, and was filled out by those residents receiving in-home training at the end of the program. To increase the response rate for the Evaluation form, a small gift of food storage containers was offered to the participants for completion of the evaluation form.

In addition, the perceptions of the service and performance of our IPM/Environmental Health Resident Advocates was obtained through a debriefing session held after all field visits were completed. Each of our IPM/Environmental Health Resident Advocates was asked a series of questions orally. The questions were designed to help us identify how well the IPM/Environmental Health Resident Advocates retained the IPM principles which were taught to them at the start of the program, how they applied these principles and their impressions of how well the information they (the IPM/Environmental Health Resident Advocates) imparted was received by their participants. The questions asked at the debriefing session are attached to the end of this report.

It was clear, from the IPM/Environmental Health Resident Advocates' general responses to the general questions that they had retained an understanding of the IPM issues and

that they were conversant in the interview session. For example, the IPM/Environmental Health Resident Advocates were asked: What IPM advice did you give the participant that you would expect that he/she will continue with, What IPM advice did you give the participant that you would not expect he/she will continue to do or follow?

The IPM/Environmental Health Resident Advocates believed that families/individuals would organize rooms better, and remove extraneous paper. In the kitchen the participant would organize storage better, vacuum up dead roach bodies and eggs from under the sink and take out the trash twice a day. However, the IPM/Environmental Health Resident Advocates were not as optimistic that residents would caulk to seal off access routes, even if they were provided with the materials.

Below is a brief summary of the advocates' responses during the debriefing session:

#### Recruitment

The IPM/Environmental Health Resident Advocates noted that the most successful methods of recruitment were the community meetings and "word of mouth." They thought this meeting was successful, because one of the advocates explained and demonstrated what work would be done during the home visits. They were approached in a sensitive manner in order to prevent them from feeling threatened. The IPM/Environmental Health Resident Advocates thought the other method (the flyers) did not work because residents are sometimes embarrassed to ask for help, or do not take the time to read the flyers.

#### Vacuum loan program

The IPM/Environmental Health Resident Advocates thought the loan service (vacuum) was useful. The IPM/Environmental Health Resident Advocates explained that some of the residents do not have these kinds of tools to remove dirt, eggs, and dead roaches.

#### Work Orders and Work Order Tracking Form

The IPM/Environmental Health Resident Advocates encountered some resistance from the participants, since many do not report repairs for fear of being held responsible for the associated cost. Not all the residents understood the responsibilities of the pest control

applicator, and not all of them understood that they could request the pest control operator to go into another room apart from the kitchen and bathroom. Some residents were afraid to approach management due to condition of the apartments.

### Extermination

Exterminators at the development were not following IPM practices. They were not requesting residents to empty out cabinets and limited their efforts to kitchens and bathrooms. The IPM/Environmental Health Resident Advocates suggested making the exterminators more sensitive to residents' point of view, to develop constructive rather than adversarial relationships.

### *Expansion of the Training Program*

The IPM/Environmental Health Resident Advocates were asked to share their experiences in the EPA-funded training program with their fellow HPHI Community Health Advocates (CHA) as we trained all remaining HPHI CHAs in IPM following the completion of the EPA-Environmental Health Training Program. Once the HPHI CHAs were trained in IPM, their designation was changed to CHA+ to denote the additional IPM training. Using the IPM/Environmental Health Resident Advocates as a model, a job description for a CHA+ was developed. A copy of the CHA+ job description, training syllabus and the final exam is included in the appendix.

### *Results*

Almost all the families who were followed in the program reported a cockroach problem in the home. Table 1 summarizes the visit-by-visit change in cockroach infestation at every unit visited.

**Table 1.** Cockroach activity by visit.

<b>Participant</b>	<b>Date</b>	<b>Kitchen</b>	<b>Living Room</b>	<b>Bedrooms</b>	<b>Bathroom</b>
B007	9/12-9/19	--	--	+	+
	9/19-9/29	+	+	--	+
	9/29-10/10	+	--	--	+
B008	08/15-08/23	+	+	+	+
	08/23-09/02	+	+	*	+
	09/02-09/12	+	*	+	+
B023	07/28-08/05	+	+	+	--
	08/05-08/14	+	--	--	--
	08/14-08/22	+	--	+	*
B024	07/28-08/06	--	--	--	--
	08/06-08/15	--	+	--	--
	08/15-08/22	+	--	--	--
B025	07/30-08/07	--	--	--	--
	08/07-08/14	--	--	--	*
	08/14-08/21	+	--	--	+
B026	07/30-08/08	--	--	--	--
	08/08-08/14	--	--	--	--
	08/14-08/23	--	--	--	--
B027	07/30-08/08	+	--	--	+
	08/08-08/15	+	+	--	+
	08/15-08/22	+	+	--	+
B028	07/30-08/08	+	*	+	+
	08/08-08/16	+	+	*	+
	08/16-08/21	+	+	+	+
B029	08/08-08/16	+	+	+	+
	08/16-08/27	+	+	+	+
	08/27-09/15	+	+	--	+
B030	08/18-08/25	+	+	--	+
	08/25-09/02	+	--	--	+
	09/02-09/09	+	--	--	+
B032	08/16-09/12	+			
	09/12-09/20	+			+
	09/20-09/30	+			--

(+): Positive      (--): Negative      (\*): Lost      (Blank): Not Placed

**Table 1.** Cont'd Cockroach activity by visit.

<b>Participant</b>	<b>Date</b>	<b>Kitchen</b>	<b>Living Room</b>	<b>Bedrooms</b>	<b>Bathroom</b>
B034	10/03-10/10	+			+
	10/10-10/17	+			+
	10/17-10/24	+			+
B035	10/03-10/10	--	--		--
	10/10-10/17	--	--		+
	10/17-10/24	+	+		--
B037	10/03-10/10	--			--
	10/10-10/20	+			--
	10/20-11/05	+			--
B038	09/20-09/27	+	+	+	+
	09/27-10/02	+	+	+	+
	10/02-10/05	+	+	+	+
B039	08/19-09/08	+	+	+	+
	09/08-09/22	+	*	+	--
	09/22-10/17	+	+	*	+
B040	08/22-09/04	+	+	--	*
	09/04-09/15	--	+	--	--
	09/15-10/02	+	--	+	+
B041	08/28-09/04	--	--	--	--
	09/04-09/11	--	--	--	--
	09/11-09/18	--	--	--	--
B042	09/02-09/09	+	--	--	+
	09/09-09/22	+	--	--	+
	09/22-09/29	+	--	--	--
B043	09/04-09/18	+	--	+	+
	09/18-10/02	+	+	+	+
	10/02-10/10	+	+	+	+
B044	09/11-09/22	+	+	+	+
	09/22-09/29	+	+	+	+
	09/29-10/17	+	+	+	+
B046	09/13-09/22	--	--	--	--
	09/22-09/29	+	--	--	--
	09/29-10/17	+	--	--	--

(+): Positive      (--): Negative      (\*): Lost      (Blank): Not Placed

<b>Table 2.</b> Mean percent positive roach traps by visit (%)			
Visit	First	Second	Third
Mean	56.4	59.8	62.8
STD	42.9	37.8	33.2

<b>Table 3.</b> Results of paired T-test comparison of percent positive roach traps by visit	
Compared Pair	P-Value
First visit to second visit	0.68
First visit to third visit	0.28
Second visit to third visit	0.48

The means of percent positive roach traps by visit are shown in Table 2. Although the means appear to increase with each consecutive visit paired t-test comparisons shown in Table 3 shows that there is no statistically significant difference in the positive roach trap count among the visits.

The IPM program did not include any pesticide application which could explain the lack of change in the roach population. The visits were spaced one week apart, which may have been too soon to detect any change in the roach population.

### *Conclusions*

Overall, we have seen different levels of success in this effort. The IPM/Environmental Health Resident Advocates were an effective mechanism for empowering residents, with information on how to control pests effectively without reliance on pesticides. The residents were also empowered with information on the duties and responsibilities of the building management and the pest control operators, so that they can effectively file grievances if needed. We feel that the IPM/Environmental Health Resident Advocate model could be used by the BHA to help educate residents in conjunction with BHA's pest wars efforts. The lack of communication between the tenants and the building managers is cited by both parties as a reason for why earlier pest control initiatives have failed.

Judging from the results of the training program and our subsequent evaluation, we believe that the program was effective not only for the IPM/Environmental Health Resident Advocates but for the residents who actively participated and received in-home training and support. A key ingredient in the effectiveness of our educational program was the in-home demonstration tailored specifically to each home that focused on how to identify sources of cockroach infestation and how to control the conditions that nurture them, such as leaks, clutter, food sources, and garbage. The IPM training program was successful as long as practitioners were consistently staying on top of everyday housecleaning, reducing clutter and eliminating all food and water sources for pests.

The residents' comments from the evaluation form were positive. All evaluation forms are included in the Appendix. Many of them thought that the program was effective in their home, and that they learned new things.

Although, we can make positive comments about the program, we did not have much success with the reporting of BHA Work Orders. We could not get all the families involved in the program to submit Work Orders. However, some of the families that agreed to report the need for repairs received a response from BHA.

Finally, the pest contractor needs to be central to the IPM program. They must be more cooperative and communicative and form a productive relationship with residents, rather than the current adversarial approach. The pest control applicator must also reinforce residents' awareness of the applicator's responsibilities towards the IPM effort.

### ***Recommendations***

The focus of the current training program was to train residents to provide training and outreach to their fellow residents concerning Integrated Pest Management. The next steps in the process should be to train those advocates to help them form productive effective partnerships with building managers and pest control operators.

This program focused on providing outreach and training so that the residents can be an active and integral partner for this effort. The next step would be to involve the IPM/Environmental Health Resident Advocates in a working dialog with the building managers and the pest control operators. To this end, we have the following recommendations:

Implement the IPM/Environmental Health Resident Advocates model in the BHA “Pest Wars” campaign. This “second generation” advocate should be involved in developing pest management plans for the development alongside of the building managers and pest control operators along with providing outreach to residents.

The HEPA vacuum cleaner loan program should be expanded to the whole development. A source of funding to maintain the vacuum cleaners and for necessary supplies like vacuum cleaner bags should be identified. Additional items for the loaner service should be identified and funding secured to support them.

As part of the pest management plan for the development, the working group of managers, pest control operators and IPM/Environmental Health Resident Advocates should develop mechanism to restore faith in the Work Order system.

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