HUD'S HEALTHY HOMES DEMONSTRATION GRANTEES: A REVIEW OF EVALUATION CAPACITY, PROGRAM ADMINISTRATION, AND BEST PRACTICES

Prepared for:

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HUD'S Healthy Homes Demonstration Grantees: A Review of Evaluation Capacity, Program Administration, and Best Practices

CONTENTS

EXECUTIVE SUMMARY

BACKGROUND AND METHODOLOGY

An evaluation of the U.S. Department of Housing and Urban Development, Office of Lead Hazard Control and Healthy Homes' (HUD OLHCHH) grant-funded research and demonstration projects under the Healthy Homes Initiative (HHI) last occurred in 2005-2007 and included both Healthy Homes Demonstration Program (HHD) and Healthy Homes Technical Studies Program grantees. The final report, *An Evaluation of HUD's Healthy Homes Initiative: Current Findings and Outcomes,* by Healthy Housing Solutions, Inc. (Solutions), was completed on March 5, 2007. Since that evaluation, approximately 54 HHD grants have been awarded from FY 2005 through FY 2009.

Objectives of the HHD grants include the following:

1. Carrying out direct remediation where housing-related hazards may contribute to injury and illness, with a specific focus on children;
2. Delivering education and outreach activities to protect children from housing-related hazards; and
3. Building capacity to assure healthy homes projects are sustained.

This report, also completed by Solutions, captures data from HHD grantees not included in the 2005-2007 evaluation as well as more recently-awarded HHD grants. Its purpose is to guide policy development and to facilitate HUD OLHCHH's preparation of guidance documents for future healthy homes efforts. It summarizes data from those grantees that have carried out the greatest number of interventions, collected the most detailed evaluation data on cost, health and housing impacts, and have demonstrated significant capacity-building and sustainable approaches to guide policy development and guidance for future healthy homes efforts. It also supports future efforts to identify evaluation data sets that would be of value to HUD OLHCCHH for additional analyses or meta-evaluation.

Twenty-seven grantees were invited to participate; a total of 25 grantees completed an online questionnaire, which represents a 92% response rate. Data collection occurred from May 1, 2014 – July 15, 2014.

GRANTEE EVALUATION METHODS AND PUBLICATIONS

Grantees that were selected to participate in this evaluation used more rigorous designs and data collection procedures. The majority of these grantees (72%) had their project reviewed by an Institutional Review Board (IRB). Only 20%, however, used a control or comparison group. Grantees had the ability to rate up to eleven items as the strongest or most effective features of their program. Of the 25 responding grantees, 48% rated their evaluation strategies as one of the most effective features.

VALIDATED MEASURES MOST COMMONLY USED BY GRANTEES

- **Juniper's Asthma Quality of Life Questionnaire** (adult and children)
- **The Asthma Control Test**
- **American Academy of Pediatrics' Children's Health Survey for Asthma (CHSA) National Heath Information Survey (NHIS)**
- **Clinical COPD Questionnaire,** developed by Thys Van der Molen
- **Medicare Health Outcomes Survey**
- **Behavioral Risk Factor Surveillance System** (BRFSS)
- **National Survey of Lead & Allergens in Housing (NSLAH)**
- **Seattle-King County Dept. of Health's Asthma Program research protocols**
- **Healthy Homes Inspection Manual**
- **EPA Asthma Home Environment Checklist**
- **Pediatric Environmental Home Assessment**

The vast majority reported using an outcome/effectiveness evaluation design in their research. The most commonly reported Quality Control/ Quality Assurance (QC/QA) procedures were frequent meetings with staff (96%), monitoring of work in progress (92%), pilot tests of questionnaires before their use in the field (56%), and integrating QC samples into biological or environmental sample testing (52%).

The majority also reported developing or adapting a tool or procedure for use in their program operations. They used a variety of methods to disseminate findings, with the most common being presentations at conferences (60%), presentations to elected officials (52%), and peer-reviewed publications or other strategies (36%). Grantees delivered over 100 presentations at professional conferences, including international, national, regional, state, and local audiences. Eighteen peer-reviewed journal articles were published by this group, with more being considered for publication.

Sixteen grantees also reported the ability to share de-identified raw or cleaned data with HUD OLHCHH.

RECRUITMENT, ENROLLMENT, AND OUTREACH

Most grantees reported that their projects involved recruitment or enrollment of clients (88%) and/or housing units (64%). More than 17,000 clients and over 3,000 housing units were enrolled by grantees. The primary targets for enrollment included families or individuals with or at-risk for asthma and housing units within specific census tracts or geographical boundaries.

INDIVIDUALS TARGETED

The majority of grantees (88%, N=22) reported having targeted individuals for their program. Grantees could specify up to 17 categories of target individuals for enrollment, as well as whether they were primary or secondary targets for recruitment efforts.

INDIVIDUALS TARGETED REPRESENT:

- **4,517 occupants under age 6;**
- **5,434 occupants aged 7 – 17;**
- **6,248 occupants aged 18-64;**
- **187 occupants over age 65; and**
- **6,248 occupants with asthma.**

The most commonly targeted groups were: 1) low-income families (88%); 2) families or individuals with or at-risk for asthma (84%); and 3) minority families (72%).

HOUSING UNITS TARGETED

Housing units were targeted by 64% (N=16) of the grantees. Grantees could specify up to 15 types of housing targets, and whether they were a primary or a secondary target for recruitment.

The most frequently targeted housing units were: 1) units located in a specific neighborhood or defined geographical boundary (e.g., census tract) (64%); 2) rental units (48%); and 3) single-family units (48%). In addition to the types of housing units specified in the survey, grantees mentioned Section 8 housing, tribal housing, and recruiting from partner programs or individuals with respiratory conditions within the targeted housing units.

HOUSING UNITS TARGETED REPRESENT:

- **3,101 units in total;**
- **1,595 rental units;**
- **776 units built before 1940; and**
- **971 units build between 1940 and 1978.**

RECRUITMENT METHODS

Grantees used a variety of methods to recruit clients for their programs. When asked to assess 18 different recruitment methods, grantees reported a mean of 7.8 methods used, with a minimum of five and a maximum of 14 (N=24).

The most frequently used methods of recruitment were: 1) community meetings, health fairs, or community events (96%); 2) referrals from health care providers and mailings or distribution of materials to local organizations (88%, each); and 3) referrals from other organizations (84%). In addition to those methods specified in the survey, grantees also mentioned the use of email blasts from partner websites, contacts with home visiting nurses who worked with asthma patients, information tables in common areas of multi-unit buildings, use of the 211 Call for Help information Line, and random digit dialing recruitment calls. Two programs mentioned word-of-mouth.

Of the methods used, the four that the majority of grantees rated as very effective were: 1) referrals from health care providers (73% rated as very effective); 2) referrals from other organizations (57%); 3) mailings or distribution of materials to organizations and/or community groups (55%); and 4) community meetings, health fairs, or community events or other methods (50%). (See Chapter 4). Although rarely used, newspaper advertisements were rated as least effective (40%).

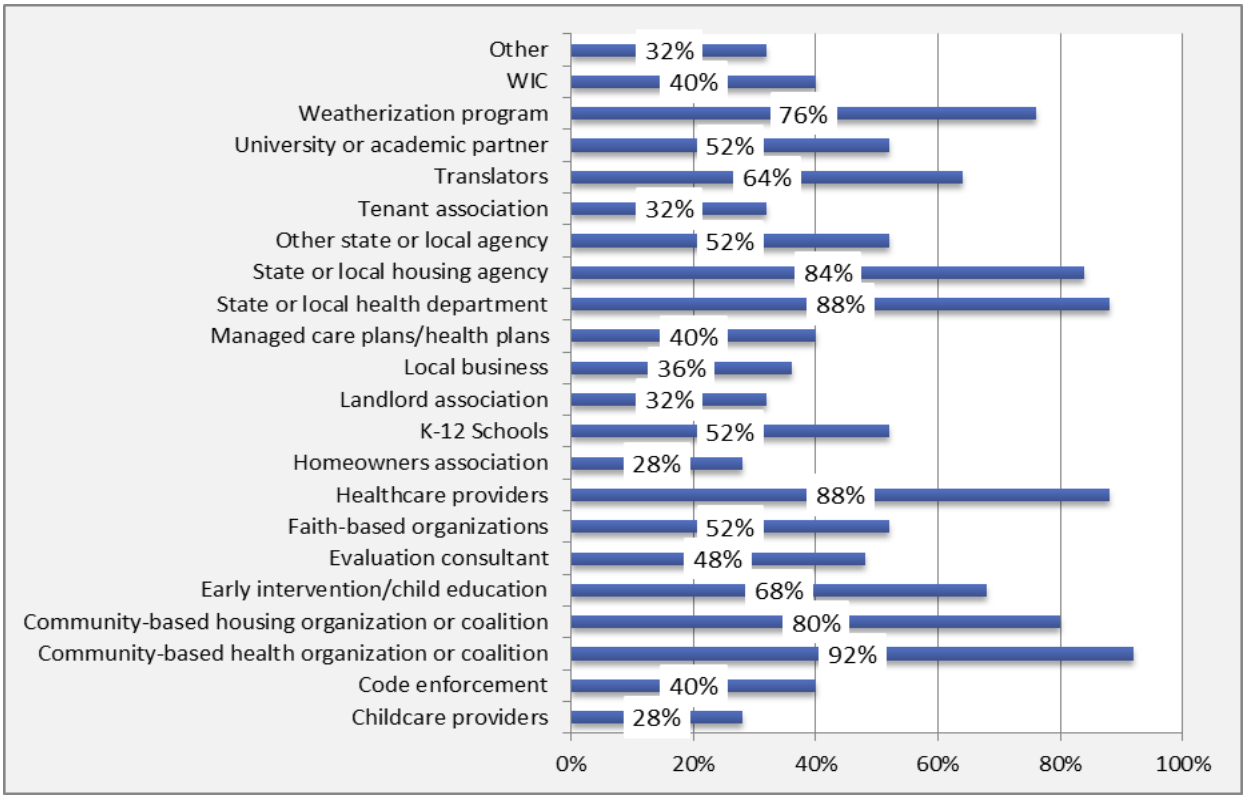
The majority of grantees (84%, N=21) reported using incentives to recruit, enroll, or retain clients. On average, grantees reported use of 2.6 incentives, with a minimum of one and a maximum of four (N=21). Of the incentives used, the most common were: 1) products/giveaways (90%); 2) interventions (67%); and 3) gift certificates (52%). The mean value of incentives per household fell between $100 and $499

(43%, N=9). The majority of grantees (80%, N=20) reported the incentives offered were effective both in recruiting and retaining clients (i.e., keeping clients enrolled).

PARTNERSHIP DEVELOPMENT

In many locations, no single agency is responsible for dealing with all healthy homes issues. Therefore, effectively addressing such issues often involved collaboration between several different partner organizations. Almost all of the grantees (96%) formed new partnerships and close to half of the grantees (40%) formed more than six new partnerships. The most common partner organizations were: 1) community-based health organizations and coalitions (92%); 2) health care providers and state and local health departments (88%, each); 3) state and local housing agencies (84%); 4) community-based housing organizations or coalitions (80%); 5) weatherization programs (76%); and 6) early intervention/early education (68%). (See Figure 1.) Many of these organizations served as paid subcontractors as well as partners, with the most common subcontractors being evaluation consultants, translators, and local businesses (e.g., risk assessment services).

FIGURE 1: ORGANIZATIONS ENGAGED AS PARTNER OR SUBCONTRACTORS (N=25)



COMMUNITY EDUCATION AND OUTREACH

In addition to education in the context of interventions, the 25 grantees also reported use of a mean of 4.9 of 10 possible community-wide education and outreach methods, with a range of two to 10. The most common methods used included: participation in health fairs (88%); visits to parent or community groups (84%); and, visits to health care providers (72%). The least frequently used methods included mass transit advertisements or social media (reported by 8% of grantees, respectively).

The following community outreach and education activities were rated as very effective by the grantees: 1) visits to health care providers (67%); 2) visits to parent or community groups (52%); and 3) mailings to community groups (48%). Surprisingly, only 32% of grantees that used participation in health fairs rated this method as very effective. Although less frequently used, broadcast media outreach, Internet ads or postings, and door to door recruitment were rated as very effective (50%, 38%, and 36%, respectively) by the grantees who used these methods.

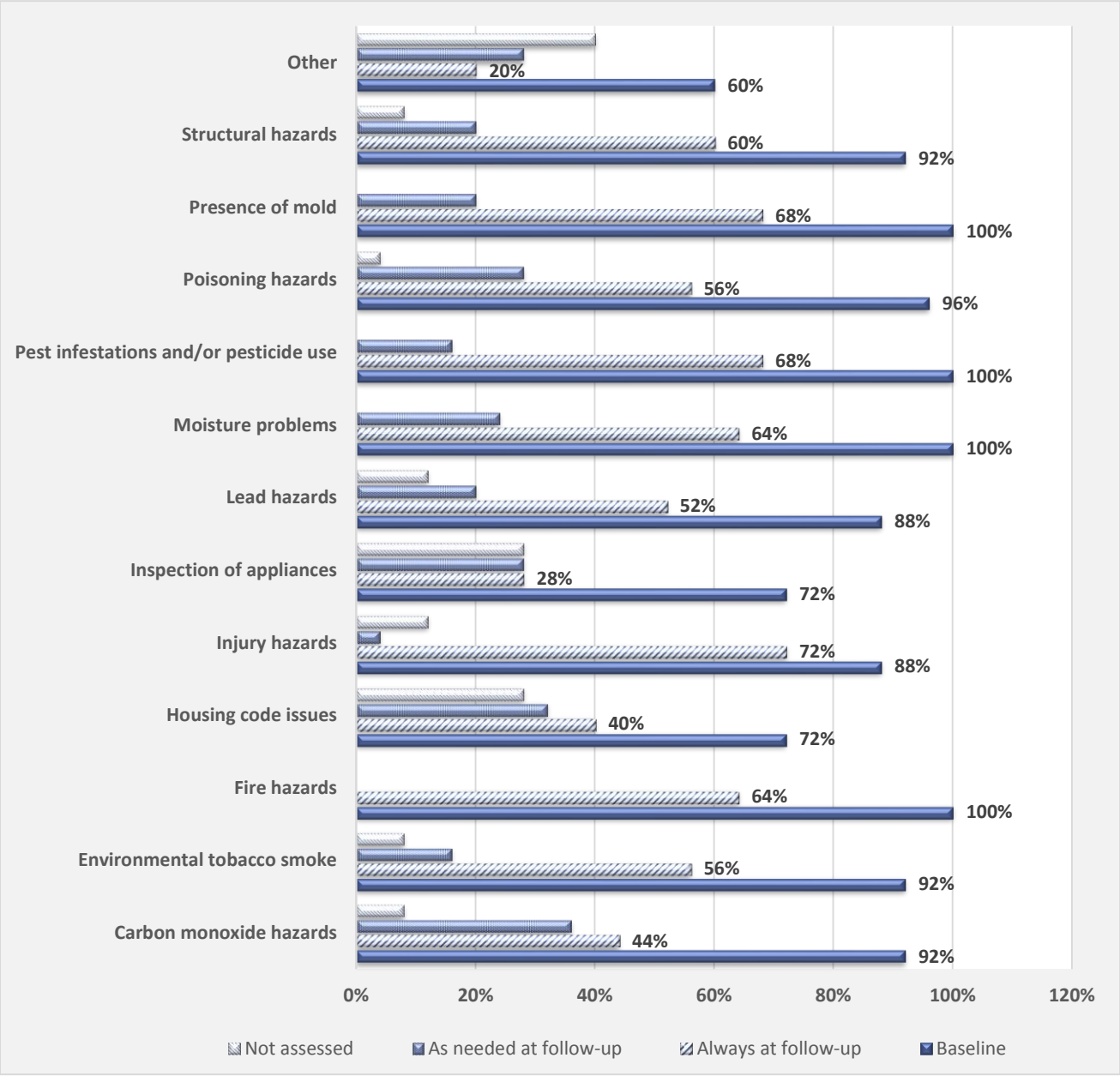
ASSESSMENTS AND INTERVENTION STRATEGIES

Grantees could report on up to four types of assessments: 1) resident surveys, including client demographics, knowledge and behavior, and health conditions; 2) visual assessments of unit conditions; 3) environmental samples taken in the unit; and 4) biological samples taken from individuals. All the grantees (100%) reported conducting resident interviews and visual assessments and 76% reported collecting environmental samples, but only 8% (N=2) reported collecting biological samples. Grantees also indicated whether they conducted these assessments at baseline, and if completed as a follow up to interventions, on an as needed basis or always at the follow up visit.

The most commonly assessed characteristics at baseline were: 1) household characteristics; 2) allergies; 3) asthma); 4) behavioral information; and, 5) health care utilization (100% or N=25 for each of the five characteristics). Other commonly collected data included: 1) resident concerns about housing conditions (96%); 2) self-report of symptoms and other respiratory conditions (92%, for each); 3) housing characteristics and health-related absences from school or work (88%, each); and 4) socioeconomic characteristics and need of additional social or other types of services (84% each). Grantees were least likely to collect information on poisonings at baseline (52%). At follow up, the grantees were more likely to collect information on health conditions, client concerns, and needs for services, and less likely to repeat collection of socioeconomic status, demographics, and housing mobility data.

There were 13 focus areas routinely addressed during the visual assessments. Baseline visual assessments always were completed for the following four focus areas: 1) fire hazards; 2) moisture problems; 3) pest infestations and/or pesticide use; and 4) presence of mold (100%, N=25). Follow-up visual assessments fell into two categories: always at follow-up and as needed at follow-up. Focus areas with the most follow-up visual assessments were: 1) fire hazards (88%); 2) moisture problems (88%); and 3) presence of mold (88%). (See Figure 2.) In addition to these 13 focus areas, at least one grantee reported assessing tap water temperature, radon, dust mite conditions, presence of pets, presence of proper ventilation, and all asthma or chronic respiratory condition triggers present in the home.

FIGURE 2: PERCENT OF GRANTEES COLLECTING HOUSING CONDITION DATA AT BASELINE AND FOLLOW-UP, BY FREQUENCY OF DATA COLLECTION AND CHARACTERISTICS

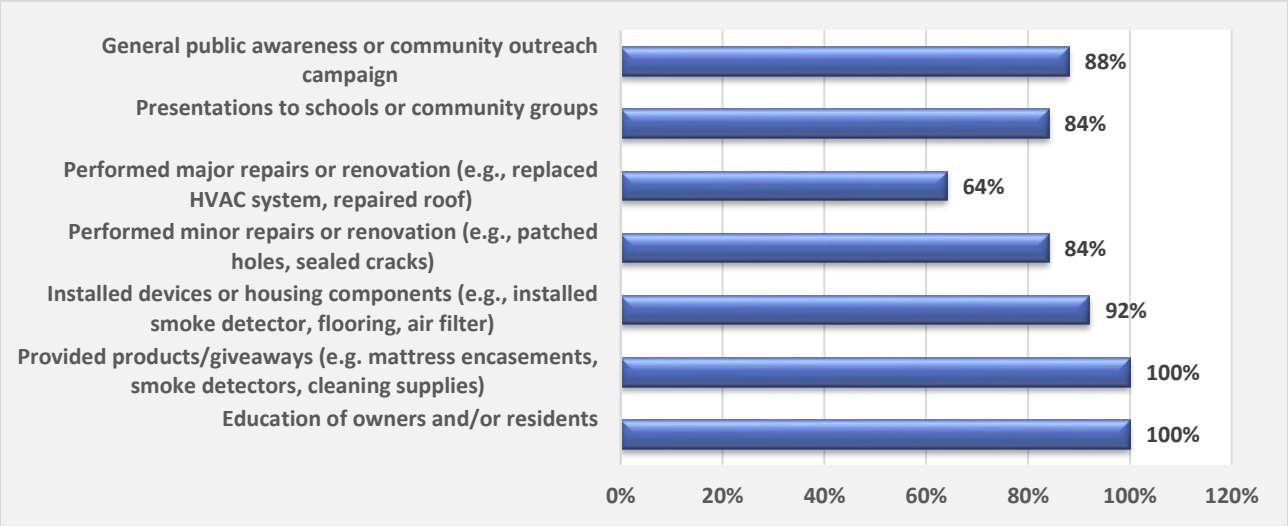


*Note: Percentages do not total 100%. Grantees could independently report whether they conducted the baseline and/or the follow-up assessment.

SUMMARY OF HOUSING INTERVENTIONS AND INTENSITY

Grantees were asked to identify specific activities they routinely conducted as part of their intervention process. As shown in Figure 3, all grantees reported both education and providing products and giveaways as interventions (100%), with installing devices or housing components the second most frequently used intervention (92% of grantees). The vast majority (84%) also performed minor repairs or renovations and a majority (64%) performed major repairs or renovations. Once the work began at a single housing unit, it commonly took within one week (28%) to within one month (24%) to complete all interventions.

FIGURE 3: INTERVENTION STRATEGIES (N=25)



Grantees most frequently characterized their interventions as moderate in intensity. In particular, Integrated Pest Management (IPM), asthma trigger control and education, and mold and moisture control were the most commonly cited interventions within the category of moderate intensity.

TRAINING

Grantees reported training a mean of 6.1 of a possible 10 categories of individuals or groups, with a range of three to 10. The groups most frequently trained were grantee or partner staff (92%), residents/tenants (72%), and property owners and remodelers/contractors (64%, respectively). Code inspectors were the least likely to be trained by grantees (48%). This survey did not ask grantees to estimate how many individuals in total received training.

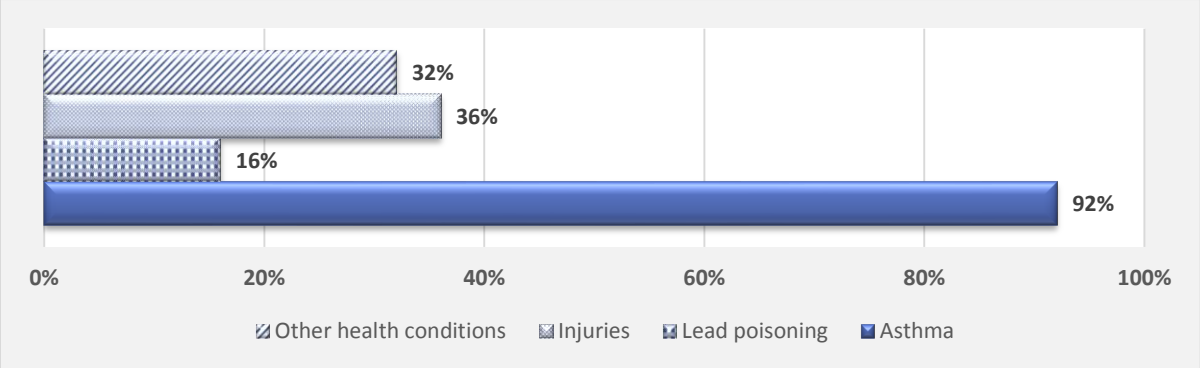
GRANT OUTCOMES

All the housing conditions for which grantees assessed change pre- and post-intervention showed high levels of improvement. The housing conditions where most grantees reported improvement between baseline and follow-up were: 1) mold and moisture (100%, N=21), and other Indoor Air Quality issues (100%, N=12); 2) asthma triggers and pest control/IPM (95% each, N=21); 3) carbon monoxide (94%, N=16) and injury and safety (94%, N=16); and 4) physical comfort (92%, N=12).

Although fewer grantees applied tests of statistical significance to these housing condition changes, those who did tended to find the improvements statistically significant.

Changes in asthma-related health outcomes were most likely to be tracked by grantees (92%). Far fewer grantees reported assessing changes in other health outcomes pre-post intervention. (See Figure 4.)

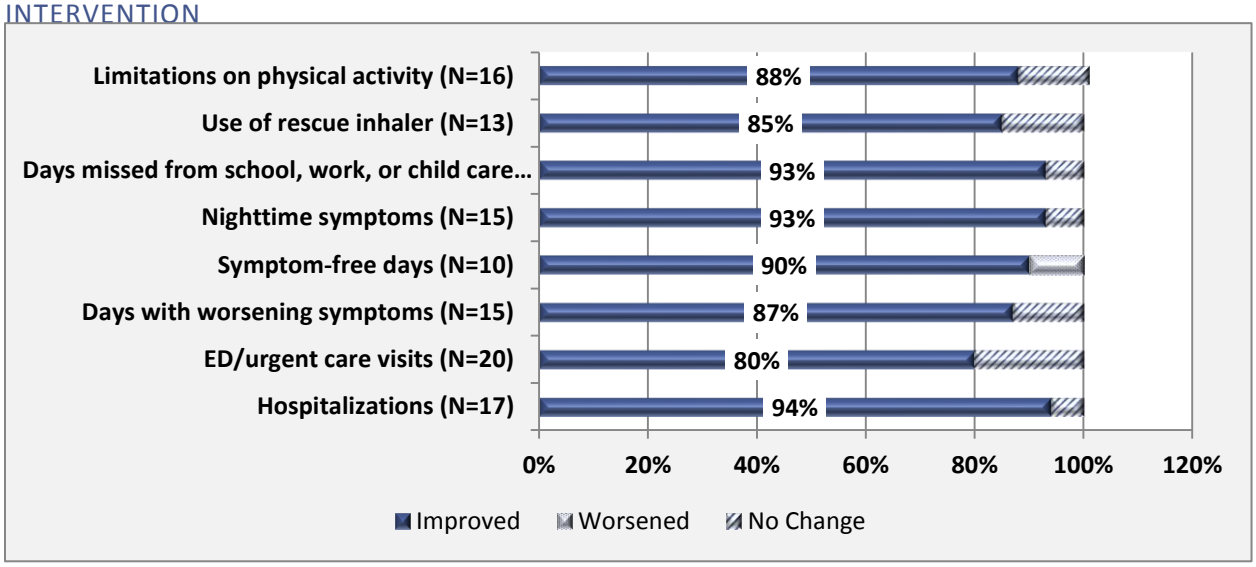
FIGURE 4: PERCENT OF GRANTEES THAT ASSESSED HEALTH OUTCOME MEASURES, PRE-AND POST-INTERVENTION (N=25)*



Of eight specific asthma outcomes, over 80% of the grantees that assessed these symptoms post-intervention reported improvement in each of these indicators. (See Figure 5.) (Appendix 3 illustrates the variety of measures and time frames grantees use to assess change within these eight asthma outcome indicators. It includes information from the survey and also from grantee final reports.)

While many grantees reported improvements in asthma outcomes, fewer provided information on the magnitude of the change, or whether they examined the statistical significance of these changes. Those who did, however, generally reported the changes as statistically significant at the $p<0.05$ level or below. (See Figure 5.)

FIGURE 5: PERCENTAGE OF GRANTEES THAT ASSESSED ASTHMA OUTCOMES, PRE- AND POST-INTERVENTION



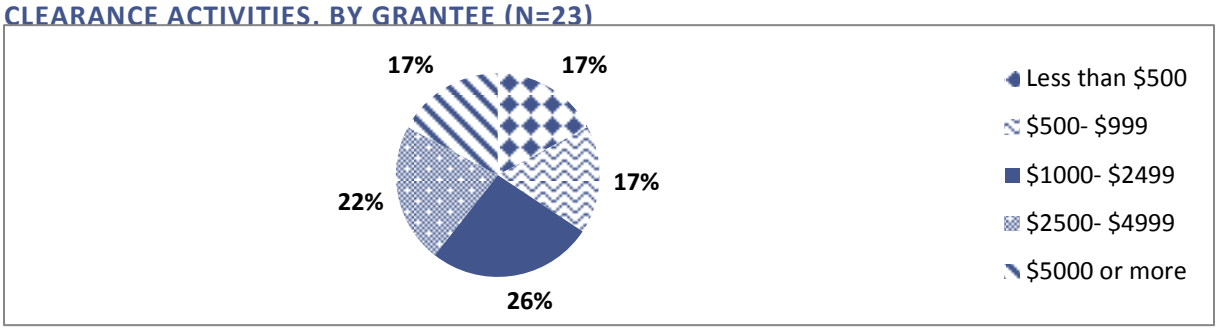
Several grantees (16%, N=4) reported data on health services related to lead poisoning. However, their cumulative impact is striking: a total of 422 children needed blood lead screening, resulting in the identification of 81 with elevated blood lead levels between 5-9 µg/dl or above, 27 with elevated blood lead levels of 10 µg/dl or above, nine in need of case management services, 32 who needed temporary relocation, and two who needed permanent relocation.

In general, grantees reported improvements in health outcomes related to injury prevention, but many of these were not statistically significant, most likely related to insufficient sample sizes. (See Appendix 2, Table 6.B.) Seven grantees reported on other health outcomes, with most focused on some aspect of allergies or other respiratory conditions. Statistically significant improvements were reported by at least one grantee for child and adult physical health.

COSTS

The majority of grantees who could provide information on the mean cost per unit for all interventions spent less than $2,499. (See Figure 6.)

FIGURE 6: ESTIMATED OVERALL COST PER UNIT FOR ALL PHYSICAL INTERVENTION AND CLEARANCE ACTIVITIES, BY GRANTEE (N=23)



*Note that the survey required that average costs be presented as ranges.

Grantees were also encouraged to provide data on the minimum and maximum costs for six specific categories of interventions. Far fewer could provide these data. (Only five grantees reported efforts to assess the cost-effectiveness of the interventions, but their commentary suggests that the interventions selected cost two to four times less that the costs to provide health care services

LESSONS LEARNED AND CONCLUSIONS

OVERALL PROGRAM STRENGTHS AND CHALLENGES

Grantees could rate up to 10 items as the strongest or most effective features of their programs. All rated collaboration and partnerships as one of the most effective features, with educational approaches, ability to identify high-risk population targets, and the housing interventions selected as the next most successful features (80%, 72%, and 60%, respectively). They could rate up to 14 items as challenges, and indicate the severity of that challenge (e.g., not a challenge, sometimes, or frequently a challenge). Cost constraints represented the most frequently mentioned challenge, with 80% of grantees rating this as sometimes or frequently a challenge, followed by resident fears of landlord repercussions (72%), obtaining consent of the property owner and meeting timeframes (68%, respectively), and getting landlords/owners to do work and getting access to the unit itself (64%, respectively). Activities least likely to be a challenge included relocating residents (80% of grantees rated this as not a challenge), obtaining a timely environmental review (76%), or changes in the target area or population (68%). Fewer grantees (N=22) answered the question of whether they encountered a challenge that they couldn't overcome, with 41% indicating that they faced such situations. The most commonly insurmountable challenges mentioned included running out of funds or inability to spent all the funds awarded, absentee landlords, more interest in the program than they had funds to serve, Davis-Bacon requirements, inconsistent participation by partners or sub-grantees, and housing units that were too deteriorated to serve with program funds.

The majority of the 25 grantees reported a need for additional funding, with 68% reporting a need for more federal funding, and 60% reporting a need for more state, local, or other funding. Grantees'

success in obtaining additional funding ranged from 32% (N=8) for local or other funding; 12% (N=3) for state funding, and 20% (N=6) for federal funding.

BEST PRACTICES

Community Education and Outreach: Grantees rated the following strategies as most effective: 1) visits to health care providers (67%); 2) visits to parent or community groups (52%); and 3) mailings to community groups (48%).

Recruitment: Grantees emphasized the need to gain resident trust, address resident fear of landlord repercussions, retain clients, and overcome landlord resistance to participation in grant activities and provided a number of specific strategies.

109,169 individuals were reached through community awareness activities, over and above those reached through recruitment or enrollment efforts.

Partnership Development: Almost all of the grantees (96%) formed new partnerships and close to half of the grantees (40%) formed more than six new partnerships. Recommended strategies to promote effective partnerships include 1) improving the referral process between agencies through use of electronic or faxed referrals and joint case management meetings; 2) conducting joint visits with the partner agency, especially if cultural issues could be barrier; 3) assuring a coordinated delivery of services through performance contracts; and 4) standardizing training across agencies.

Assessment and Interventions: Grantees highlighted the need to collect only the data that the program can use, to plan for delays in program start up when Institutional Review Board reviews are needed, to use electronic tools in the field, and to use tested and validated tools. Building a team of qualified contractors, linking education to observable behavior changes at each home visit, and knowing when to walk away from a project were important take-away messages about planning and executing interventions.

SUSTAINABILITY

Program sustainability involves many concepts. In this survey, grantees discussed whether tools or procedures they developed remain in use, staff received training, organizational changes were made to increase effective service delivery, and additional regulatory or administrative support and funding were needed and obtained. In general, grantees reported considerable success in maintaining components of the infrastructure they developed for healthy homes programs after their grant ended.

At the time of the survey, over 70% of the grantees reported that the tools or procedures that they developed or adapted for their programs were in use by their program or others after the grant ended. Grantees reported a mean of 3.7 tools still in use, with a range of one to 8. Those most commonly in use were the educational materials (85%), visual assessment (78%), training curriculum (77%), and partnerships (74%).

The majority of grantees also reported that they made organizational changes to deliver their services effectively, but 50% reported more changes were needed.

Grantees could report whether they still needed, and whether they had obtained, any of eight legislative or regulatory actions since their grant ended. Of the 25 grantees, 60% reported they did not need additional legislative authority. Fewer reported a need for policy changes (48%, N=12) or a need for additional Memoranda of Understanding between agencies or organizations (44% N=10). Those who reported a need for these authorities had varied success in obtaining them, ranging from 4% (N=1) that obtained legislative authority to 32% (N=8) that executed new MOUs.

CONCLUSIONS

Grantees believed that the HHD grants should be returned to a separate grant category, rather than as an adjunct to the Lead Hazard Control Grants (see Appendix 2, Table 8.A). Among the factors that they cited to support this position were:

1. The need for continuity of healthy homes services. Many communities may not need a lead hazard control program, but do require asthma- and injury-related interventions.
2. The need for continuity of partnerships, materials, and training. The effort to train staff to assist with asthma- and IPM-related interventions is initially costly. Once these staff members are trained, however, they can be deployed in other programs. Without sustained funding, the mechanisms to achieve these partnerships are difficult to build and support. Several grantees observed that their programs closed once grant funding ended.
3. The ability to support requests for Medicaid reimbursement of services. The available funding for healthy homes activities under the Lead Hazard Control grants is not sufficient to show the costs and benefits of medical management and home visiting, as well as efforts to justify inclusion of certain equipment, such as air cleaners, and medical devices.

Their contributions to the overall improvement in housing outcomes, and the benefits to resident health, make a compelling case that this grant funding has been well spent. Among these benefits are:

1. Relatively low-cost interventions;
2. Demonstrated ability to leverage federal funding with other sources, thus building capacity and ensuring that communities' support for healthy homes interventions will grow in the future;
3. Rigorous methodology to demonstrate that housing conditions improved following Healthy Homes-related interventions;
4. Documented improvements in the health of individuals served by the grantees, especially in the area of asthma outcomes. This supports the message that health care costs can be reduced through changes to the home environment; and
5. Eight core asthma outcome measures identified in the survey, as well as the other measurement tools grantees developed, provide the basis for standardizing future performance measures;
6. Clear evidence that grants have contributed to the goals of the Federal Interagency Working Group's *Advancing Healthy Housing: A Strategy for Action.*

CHAPTER 1: BACKGROUND

In April 1999, the U.S. Department of Housing and Urban Development (HUD) submitted to Congress its Health Housing Initiative (HHI). The HHI built upon HUD's existing housing-related health and safety issues, including lead hazard control, building structural safety, electrical safety, and fire protection to address multiple childhood diseases and injuries, such as asthma, mold-induced illness, carbon monoxide poisoning, and other conditions related to housing in a coordinated fashion. The HHI departed from the more traditional approach of attempting to correct one hazard at a time (e.g., asbestos, radon). Its mission was "To reduce health and safety hazards in housing in a comprehensive and cost effective manner, with a particular focus on protecting the health of children and other sensitive populations in low income households." (*Leading Our Nation to Healthier Homes: The Healthy Homes Strategic Plan,* U.S. Department of Housing and Urban Development, Office of Healthy Homes and Lead Hazard Control, 2009, p.7.*)* Since 1999, federal agencies have partnered with HUD's Office of Lead Hazard Control and Healthy Homes (OLHCHH) to expand the scope of healthy homes-related research, technical assistance, training and evaluation. These efforts culminated in the 2013 Federal Healthy Homes Work Group's *Advancing Healthy Housing: A Strategy for Action.*

Evaluation of grant-funded research and demonstration projects funded under the HHI was last conducted in 2005-2007 and included both Healthy Homes Demonstration Program (HHD) and Healthy Homes Technical Studies Program grantees. It resulted in the final report, *An Evaluation of HUD's Healthy Homes Initiative: Current Findings and Outcomes,"* completed by Healthy Housing Solutions, Inc. (Solutions) on March 5, 2007.

Between FY 1999 and FY 2006, HUD awarded 84 HHI grants. The 2007 evaluation ultimately included 61 of 63 grantees, primarily those whose grants were awarded between FY 1999 and 2004. FY 2005 grantees were not included in the evaluation because they were in the early phases of setting up their programs and did not have much experience with program implementation; the FY 2006 grants were not announced at the time that data collection occurred.

Approximately 54 HHD grants were awarded from FY 2005 through FY 2009. Objectives of the HHD grants include the following:

1. Carrying out direct remediation where housing-related hazards may contribute to injury and illness, with a specific focus on children;
2. Delivering education and outreach activities to protect children from housing-related hazards; and
3. Building capacity to assure that healthy homes projects are sustained.

This report, also prepared by Solutions, captures the results from selected HHD grantees not included in the 2005-2007 evaluation. The purpose of this effort was to guide policy development and guidance for future healthy homes efforts. The report summarizes data from those grantees that have carried out the greatest number of interventions, collected the most detailed evaluation data on cost, health and housing impacts, and have demonstrated significant capacity-building and sustainable approaches. It also supports future HUD OLHCHH efforts to determine whether the grantees produced project evaluation data sets that would be of value for conducting additional analyses.

CHAPTER 2: METHODS

Twenty-five grantees completed an online survey based on data collection instruments that Solutions developed for its 2005-2007 evaluation of HHI grantees. This represents a 92% response rate. Data collection occurred from May 1, 2014 – July 15, 2014. Quality control reviews took another two months.

2.1 QUESTIONNAIRE DESIGN

For this evaluation report, HUD OLHCHH instructed Solutions to modify the questionnaire it had developed for *An Evaluation of HUD's Healthy Homes Initiative: Current Findings and Outcomes,"* Healthy Housing Solutions, Inc., March 5, 2007 to avoid duplication of data collection, reduce burden to HHD grantee staff, and focus more specifically on the amount and quality of the data collected on interventions, costs, and health and housing outcomes.

Solutions had developed a telephone survey for the 2005-2007 evaluation to capture key information about recruitment/enrollment, assessment, interventions, skills training, and community education/outreach in HHI grantee projects. As required by the Paperwork Reduction Act, approval of the questionnaire was obtained from the Office of Management and Budget (OMB) prior to its administration (OMB Control Number 2539-0022, expiration 6/30/2009). The survey captured key information about grantee projects funded in fiscal years 1999 to 2004. It was intended to be administered during a two-hour telephone interview. However, to ease the respondent burden for grantees, Solutions extracted information from grantee work plans, quarterly reports, manuscripts, and/or final reports, and pre-filled the questionnaire prior to the interview. The pre-filled questionnaire was then sent to grantee representatives who were asked to review information for accuracy and complete the unpopulated responses prior to the phone interview. Interviews were conducted between May and September 2006. A total of 63 grantees (36 HHD grantees, 21 Healthy Homes Technical Studies grantees, four Education grantees, and two Mold and Moisture Control grantees) were interviewed, 20 of which had active projects at the time of the interview. (*An Evaluation of HUD's Healthy Homes Initiative: Current Findings and Outcomes,"* Healthy Housing Solutions, Inc., March 5, 2007, p. ES-2.)

The key modifications involved in the 2014 data collection effort were: 1) administration of the survey through a secure online data collection system to further reduce burden on the grantees, and 2) use of as many closed-ended and categorical response questions as possible. From October through November 2012, the questions were revised to provide more fixed response categories, clearer instructions for how to answer questions, and more detail on the nature of cost and evaluation data collected. The draft of the pilot questionnaire was reviewed in late November and early December 2012 by the HUD OLHCHH Government Technical Representative (GTR) and Government Technical Monitor (GTM). As a result, the instrument was revised to address their comments about content and format in December 2012.

The questionnaire was then piloted in February 2013 by two HHD grantees whose grants were awarded in FY 2005 and completed by FY 2008. It was subsequently revised to improve clarity and reduce response burden. Prior to the actual pilot, Solutions conducted a one-hour webinar with the two pilot grantees to review procedures for completing the questionnaire. The grantees were given four weeks to complete the pilot. Each grantee received a biweekly request for feedback on progress. After the online pilot questionnaire was recorded as completed in Survey Monkey Gold®, Solutions scheduled a one-hour phone debrief with each pilot grantee separately. Pilot grantees received a copy of their responses prior to this debriefing call. During the call, Solutions reviewed key questions with the pilot grantees for item difficulty, confusion with the definition of terms, and response format.

Both grantees indicated that it took less than 12 hours to complete the pilot questionnaire. Approximately one hour was required for the debriefing call with Solutions and one hour for the webinar. Thus, the pilot results supported the estimated 16 hours per grantee burden rate specified in the application for the OMB Information Collection Request approval. Pilot grantees had relatively few suggestions about revisions to the online questionnaires and reported little difficulty in understanding the purpose of the questions. Both indicated that four weeks would be sufficient time to complete the questionnaire, since the grantee responses would involve discussions with other staff or retrieving records that might have gone into storage.

After pilot testing, the data collection instrument was submitted to OMB and approved in February 2014 (OMB Control Number 2539-0024, expiration date 02/28/2017).

2.2 RESPONDENT UNIVERSE AND SAMPLING PLAN

The respondent universe is HUD OLHCHH's HHD grantees whose grants were awarded from FY2005-FY2010 and completed by FY 2013. There are 54 grants in this universe. Twenty-two grantees whose final reports were completed in FY 2013 were selected to participate; additional grantees whose grants were closed by early FY 2014 were later included. In total, 27 grantees were selected to complete the survey. *"An Evaluation of HUD's Healthy Homes Initiative: Current Findings and Outcomes,"* the earlier Solutions evaluation of the HHI on which this survey was based, had a 97% response rate (i.e., 61 grantees participated, 63 grantees were invited to participate). Solutions projected a similar response rate for this data collection effort.

The sample was designed to identify HHD grantees that had completed the greatest number of interventions, collected the most detailed evaluation data on cost, health, and housing impacts, and who could demonstrate significant capacity-building and sustainable approaches to program implementation. Since the purpose of this data collection effort was to generate data that could improve HUD OLHCHH guidance on healthy homes methodology, there was no expectation that the questionnaire results would yield statistically representative data on the universe of programs that implement this methodology.

Sampling methodology was as follows:

1. HUD OLHCHH initially provided Solutions with 42 HHD grantee final reports for grants that closed from 2009-2012. These reports described grantee progress toward their stated grant objectives, obstacles in implementation, generalized costs of interventions, extent of pre-post data collection, and information about lessons learned during implementation.

2. Between December 15, 2012 and February 5, 2013, Solutions reviewed and abstracted 42 grantee final reports, using a HUD-approved Screening Tool and entering the data into a Survey Monkey Gold® software database. A team of three Solutions staff members was trained to code the reports similarly to insure inter-rater consistency. Solutions' Project Manager reviewed a quality control sample of five reports to assure that consistency was maintained.

a. Based on this review, Solutions identified 13 grantees as strong candidates for participation in the online questionnaire and another 14 grantees as weaker but still appropriate for inclusion in the pool of recommended grantees. The remaining grantees did not meet the criteria for comprehensive pre-post data collection, detailed cost data, or intensity of interventions.

b. Of this pool of 27 grantees, two participated in the February 2013 pilot of the online questionnaire. After consultation with OLHCHH staff, Solutions determined that grants included in the pilot should not be asked to participate in the final online questionnaire. One of the pilot participants, whose program had received two HHD awards during the period, completed the survey based on the grant it had completed most recently. The staff member who had supplied information on the other grant in the pilot had left the grantee location; no other knowledgeable staff were available to participate in the 2014 survey.

c. Of the remaining 25 candidates, three had more than one grant during this period. Solutions selected the most recently closed grant for inclusion in the sample, on the grounds that multiple competitive grant awards indicated a greater grantee capacity to implement healthy homes strategies and better infrastructure to collect data.

d. Solutions compared the final 22 candidates to the entire pool of 42 grantees to assure that no grantee with unique features was overlooked in the final recommendations to HUD OLHCHH (see Table 2.1.) Twenty-two grantees were recommended for inclusion, based on the abstraction results.

3. HUD OLHCHH reviewed the list of recommendations and included one other program based on unique features of the program that OLHCHH had seen, but were not captured in the final report.
4. HUD OLHCHH later provided the final reports and contact information for seven additional grantees whose grants were completed in FY 2013.
5. Two of the originally selected grantees have since dissolved their organizations and could not be reached.

TABLE 2.1: COMPARISON BETWEEN RECOMMENDED SAMPLE GRANTEES AND ALL GRANTEES, BY SELECTED CHARACTERISTICS

Characteristic	22 Grantees Initially Recommended for Inclusion in the Study	42 Grantees Whose Final Reports were Reviewed
Target Populations for Interventions (Top three mentioned)	Residence in a specific neighborhood (86.4%) Families or individuals at risk for asthma (81.8%) Low income individuals (77.3%)	Residence in a specific neighborhood (78.6%) Families or individuals at risk for asthma (71.4%) Low income individuals (66.7%)
Target Geographic Areas for Interventions (Top three mentioned)	Specific neighborhood or census track (86.4%) Rental units (18.2%) Multi-family units 13.6%)	Specific neighborhood or census track (78.6%) Rental units (19%) Multi-family units (11.9%)
Target Based on Existing Health Conditions	Asthma (72.7%) Lead poisoning (9.1%) Injury (4.5%)	Asthma (67.7%) Lead poisoning (11.9%) Injury (4.8%)
Target Based on At-risk for Health Conditions	Asthma (22.7%) Lead poisoning (22.7%) Injury (13.6%)	Asthma (16.7%) Lead poisoning (14.3%) Injury (11.9%)
Costs Data Provided	Estimated costs only (0.0%) Actual per unit or per individual cost (45.5%) Actual costs by program component (e.g., type of intervention (63.6%)	Estimated costs only (4.9%) Actual per unit or per individual cost (46.3%) Actual costs by program component (e.g., type of intervention) (53.7%)
Pre-post Data Collected	Health Outcomes (90.9%) Housing Conditions (63.6%) Environmental Samples (54.5%) Biological Samples (0.0%)	Health Outcomes (66.7%) Housing Conditions (52.4%) Environmental Samples (38.1%) Biological Samples (2.4%)
Control/Comparison Group	Yes (22.7%)	Yes (12.2%)
Solutions Rating of Quality of Health Outcome Evaluation Methodology	Low (4.5%) Medium (13.6%) High (68.2%)	Low (11.9%) Medium (14.3%) High (45.2%)
Solutions Rating of Quality of Housing Condition Outcome Evaluation Methodology	Low (9.1%) Medium (40.9%) High (36.4%)	Low (16.7%) Medium (33.3%) High (23.8%)

2.3 DATA COLLECTION AND REVIEW

HUD OLHCHH sent the selected grantees an invitation to participate in the survey in early April, 2014. The grantees were also offered the opportunity to participate in a webinar before they began to complete the questionnaire (April 28 and 29, 2014). The purpose of these webinars was to provide an overview of the questionnaire and answer grantees' questions on how to submit their responses. Twenty-seven of the selected grantees participated. Following the webinars, Solutions developed a Frequently Asked Questions (FAQ) sheet to aid respondents, and also made several minor clarifications to question wording or provided additional examples in the online survey. No incentives were provided to grantees for participation in the online questionnaire since HHD Grantees are required, as a condition of the Notice of Funding Availability (NOFA) under which their awards were made, to participate in HUD-funded research or evaluation studies.

Survey administration began May 1, 2014 and continued throughout July 15, 2014. Bi-weekly reminders to start and/or complete the survey were automatically sent through the Survey Monkey Platinum® software database. After June 1, these were sent weekly. Twenty-five grantees completed the survey. (See Appendix 1 for names of grantees, period of performance, and contact information.)

Quality control reviews included:

1. Review of completed surveys for missing data and conflicting answers;
2. A request that respondents review PDF of their responses, with responses that needed clarification or follow up identified by email; and
3. Correction of the dataset by Solutions' project team members based on the responses to the quality control review.

2.4 DATABASE DEVELOPMENT AND USAGE

Data from the Survey Monkey Platinum® database were imported into a SAS 9.3 database for further analysis.

No statistical estimation procedures were used since these data are intended solely to inform HUD OLHCHH guidance on HHD methodology. There is no expectation that the questionnaire results will yield statistically representative data on the universe of programs that seek to implement the HHD grant methodology. All data reported on property or resident outcomes came from the grantees and were not subject to independent verification by Solutions.

The evaluation data analysis consists of descriptive statistics, such as simple counts and cross-tabulations of the number and percent of grantees reporting responses to survey questions. Most of the questions require categorical or ordinal-level data. Interval level data are limited, and confined to counts and ranges of number of individuals or properties targeted, yield in enrollment, numbers and timing of data collection instruments administered by grantees, etc.

Selected grantees whose responses to the online questionnaire indicate they had high quality evaluation data on outcomes or costs will be asked to provide a de-identified raw dataset for HUD OLHCHH's further use, including the determination of accuracy and reliability for secondary data analysis subject to the collecting agencies' guidelines intended use.

CHAPTER 3: GRANTEE EVALUATION METHODS AND PUBLICATIONS

3.1 SUMMARY OF GRANTEE EVALUATION METHODS AND PUBLICATIONS

Grantees were selected to participate in this evaluation because they had used more rigorous designs and data collection procedures. The majority of grantees (72%) had their projects reviewed by an Institutional Review Board (IRB). Only 20%, however, used a control or comparison group. Grantees had the ability to rate up to 11 items as the strongest or most effective features of their program. Of the 25 grantees, 48% rated their evaluations strategies as one of the most effective features.

The vast majority reported used an outcome/effectiveness evaluation design in their research. (See Figure 3.1.) The most commonly reported Quality Control/ Quality Assurance (QC/QA) procedures were frequent meetings with staff (96%), monitoring of work in progress (92%), pilot tests of questionnaires before their use in the field (56%), and integrating QC samples into biological or environmental sample testing (52%).

The majority of grantees developed their own measures or modified a validated measure that is currently in use.

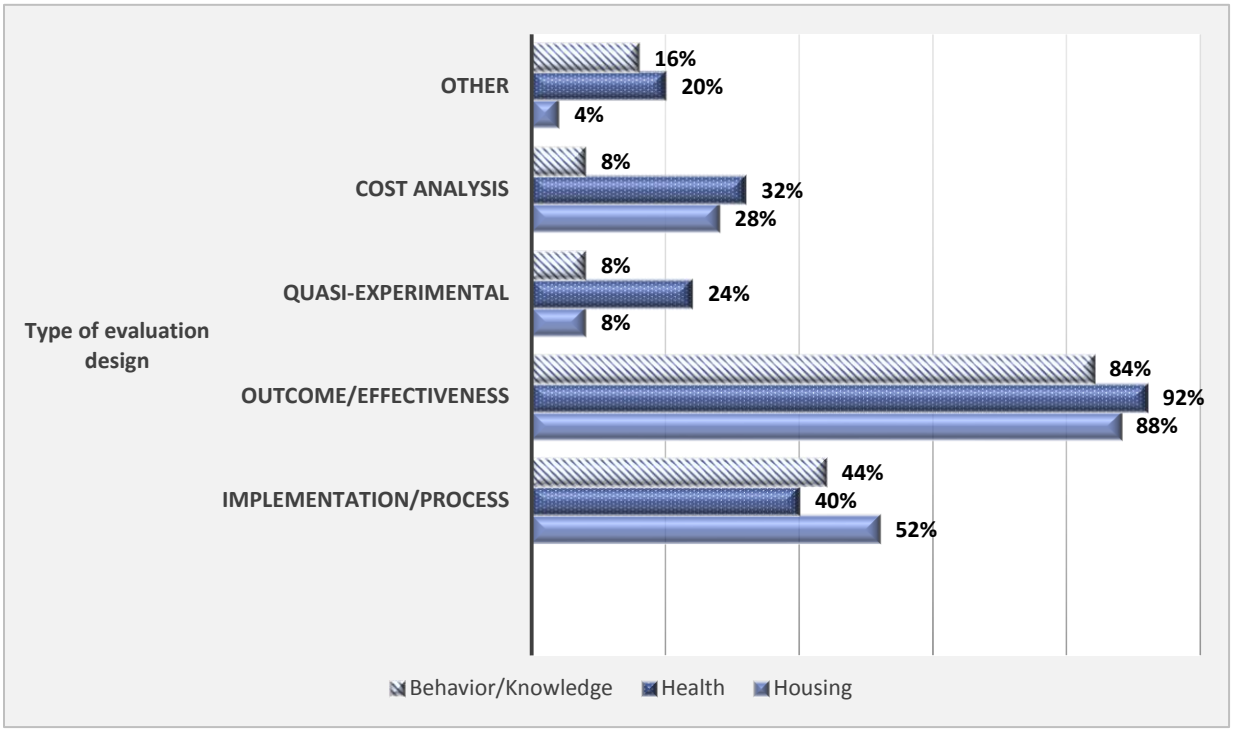
Grantees used a variety of methods to disseminate findings, with the most common being presentations at conferences (60%), presentations to elected officials (52%), and peer-reviewed publications or other strategies (36%). Eighteen peer-reviewed journal articles werepublished by this group, with more being considered for publication.

The majority of grantees also reported the ability to share de-identified raw or cleaned data with HUD OHHLHC.

3.2 EVALUATION DESIGN

Grantees could report on their use of up to five different evaluation designs to assess changes in housing conditions, health outcomes, or behavior and knowledge. The majority reported using outcome/ effectiveness evaluations to assess changes in all these conditions. (See Figure 3.1.)

FIGURE 3.1: PERCENTAGE OF GRANTEES REPORTING USE OF DIFFERENT EVALUATION DESIGNS, BY OUTCOME STUDIED



One of the grantees reported using an outside evaluator to perform the evaluation, and several others reported using outside staff to conduct quality assurance or data entry. (See Table 3.1.) (Note that throughout this report, the authors have made every attempt to provide verbatim comments for all tables that involve grantee observations; spelling was corrected but grammar and phrasing was not.)

TABLE 3.1: ADDITIONAL GRANTEE COMMENTS ABOUT EVALUATION STRATEGIES

Comments
Part of the evaluation has been performed while other components are currently being evaluated. An open experimental designed was used that looked at health outcomes pre- and post-intervention.
Estimate of cost savings based on reduction in number of emergency room visits and hospitalizations.
Asthma: Compared hospitalizations for the year prior to home visit to the year after the visit.
Behavior-implementation recorded compliance with medication usage at initial, 3 mo. and year.
As part of the outcome/effectiveness evaluation, a self-assessment tool was designed and administered to better understand clients perceived priorities and to serve as a guide for the Health Educator.

The program used the Juniper questionnaires for pre- and post-evaluation of allergy/asthma interventions/education.
The Safe at Home Program Healthy Homes Demonstration Program was focused on producing reductions in asthma episodes in 100 children enrolled in the Program through an assessment and intervention model that was designed to measure reductions in indoor allergens and improvements in health outcomes. Dr. Andrea Kidd-Taylor, MPH PhD, directed Morgan State University School of Community Health's role in the development of resident health surveys, data analysis, and evaluation. The completion of pre-intervention and 6 month post intervention Healthy Home resident surveys were conducted by Johns Hopkins University School of Nursing and Johns Hopkins Bloomberg School of Public Health students. The Program drew on Dr. Kidd-Taylor's extensive experience in public health delivery systems and Johns Hopkins University professors for the development and implementation of the client health surveys. The Morgan State University School of Community Health Data and Evaluation Team was composed of Andrea Kidd Taylor, DrPH, MSPH, Assistant Professor, Lakaisha Yarber, DrPH, MS, Research Associate, and Dr. Mackessa Dr. P.H., Research Associate.
A comparative study was used to determine whether remediation of environmental triggers in conjunction with asthma case management is a more cost-effective means of treating asthma symptoms than case management alone. Current findings revealed that participants' frequency of asthma symptoms, utilization of emergency medical services, and # of school days missed due to asthma symptoms declined. Our observational data also indicated that the prevalence of cockroaches, rodents, mold, and mildew in home environments declined from Baseline as supported by the reduced allergen readings.

Eighteen of the grantees were subject to review by an IRB, with 36% of these subject to a full review and 16% subject to expedited review; 22% were ruled project exempt by the IRB. Only five (20%) included a comparison or control group. The controls were selected primarily on the basis of resident health or demographic characteristics and/or specific type of intervention received. Additional details on the chosen comparison groups are provided in Table 3.2.

TABLE 3.2: GRANTEE DESCRIPTIONS OF CONTROL GROUPS

Comments
We are currently developing a control population of patients served by the hospital during the same timeframe as the grant program, but who never participated in any healthy home/case management/environmental intervention services.
We are currently funded by the Kresge Foundation to provide a pre/post comparison study using self-reported data and Medicaid medical utilization and prescription fill data. We also identified a control group of 40 of the 250 participants that qualify for the Medicaid comparison. We have chosen 80 participants with similar demographics from 2 separate target areas as the control group.
Statistical analysis indicated that both interventions were effective in improving the health outcomes of persons with asthma, reducing airborne allergens, and reducing the prevalence of pest infestation and moisture intrusion in the home environment. Successful completion of either intervention in the residential assessment and unit completion typically resulted in improved asthma health outcomes, reduced airborne allergen levels, and reduced pest infestation and moisture intrusion. For many indicators, the Intensive group yielded more

favorable outcomes than the Standard group; however, the differences between these outcome indicators were not large enough to conclude that the difference was due solely to the differing interventions. Perhaps, a longer time period of 6 months to a year would yield a better results rather than the 3 months follow-up conducted under this grant. Given that it often takes 3-6 months before residential environmental changes can fully manifest in collateral health impacts, extension of the follow-up assessment is warranted.
A previous study using only CHW with children and caregivers was the comparison group. Participants drawn from the previous HH-II study served as this study's historical comparison group. Comparison group enrollment occurred between November 2002 and October 2004, with CHW home visits ending in November 2005. CHWs for both the study and comparison groups received the same training and followed similar home visit protocols. Comparison group eligibility criteria (similar to the study group criteria) were as follows: children aged 3 to 14 years with not well-controlled or very poorly controlled asthma; income below 200% of the 2001 federal poverty threshold or child enrolled in Medicaid; caretaker's primary language English, Spanish, or Vietnamese; and residence in King County, Washington. The HH-II research team recruited comparison group children primarily through community and public health clinics.
A group of senior patients who received inspection services compared to a control group that did not receive **inspections.**

3.3 DATA QUALITY CONTROL AND QUALITY ASSURANCE

Grantees reported on their use of nine possible QC/QA procedures, as well as commented on other strategies they used to ensure high quality data. The most commonly reported QC/QA procedures were frequent meetings with staff (96%), monitoring of work in progress (92%), pilot tests of questionnaires before their use in the field (56%), and integration of QC samples into biological or environmental sample testing (52%). (See Table 3.3.)

TABLE 3.3: DATA QUALITY CONTROL STRATEGIES REPORTED BY GRANTEES

Quality Control Strategy	N	Yes (N)	No (N)
Data were double entered into the study database	25	28% (7)	72% (18)
Range checks were programmed into the study database	25	28% (7)	72% (18)
Inter-rater reliability was determined for assessment tools	25	12% (3)	88% (22)
Questionnaires were pilot tested during development	25	56% (14)	44% (11)
QC samples were integrated into the biological/environmental sampling process	25	52% (13)	48% (12)
Collection of field data was observed at a specified	25	48% (12)	52% (13)

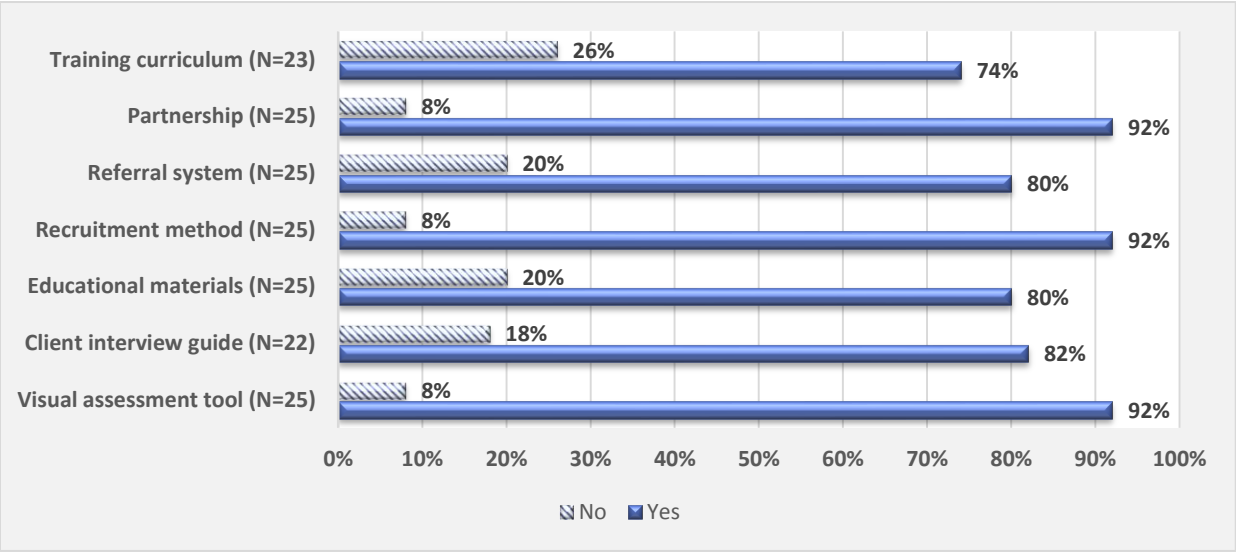
Quality Control Strategy	N	Yes (N)	No (N)
frequency			
Staff provided with refresher training at specified intervals	25	48% (12)	52% (13)
Frequent meetings with all project staff	25	96% (24)	4% (1)
Monitoring of interventions/work in progress	25	96% (24)	4% (1)
Other (please describe below)	25	40% (10)	60% (15)

Additional quality control procedures included: 1) use of outside QA consultants (N=2); 2) use of questions from previously validated or standardized questionnaires (N=2); and 3) additional validation checks on the data entry. (See Table 3.A, Appendix 2.)

3.4 USE OF VALIDATED MEASUREMENT TOOLS

The majority of grantees reported that they both developed assessment tools and modified other programs' tools and strategies. (See Figure 3.2.)

FIGURE 3.2: PERCENT OF GRANTEES WHO REPORTED DEVELOPING OR ADAPTING A TOOL OR STRATEGY FOR THEIR PROGRAMS' USE, BY CATEGORY



Grantees reported use of the following tools for their resident interviews, although many noted that they made modifications to those tools (see also Table 5.A, Appendix 2):

1. Juniper's Asthma Quality of Life Questionnaire (adult and children) (http://www.qoltech.co.uk/);
2. The Asthma Control Test (http://www.asthma.com/resources/asthma-control-test.html);
3. American Academy of Pediatrics' Children's Health Survey for Asthma (CHSA) (http://www2.aap.org/research/asthma/);
4. National Heath Information Survey (NHIS) (http://www.cdc.gov/nchs/nhis.htm);
5. Clinical COPD (Chronic Obstructive Pulmonary Disease) Questionnaire developed by Thys Van der Molen (http://respiratory-research.com/content/supplementary/1465-9921-7-62-s1.pdf);
6. Medicare Health Outcomes Survey (http://www.hosonline.org/Content/Default.aspx);
7. Behavioral Risk Factor Surveillance System (BRFSS) (http://www.cdc.gov/brfss/);
8. National Survey of Lead & Allergens in Housing (NSLAH) (http://www.niehs.nih.gov/research/join/ongoing_studies/studies/riskassess/nslah/index.cfm); and
9. Seattle-King County Dept. of Health's Asthma Program research tools (http://www.kingcounty.gov/healthservices/health/chronic/asthma/current.aspx).

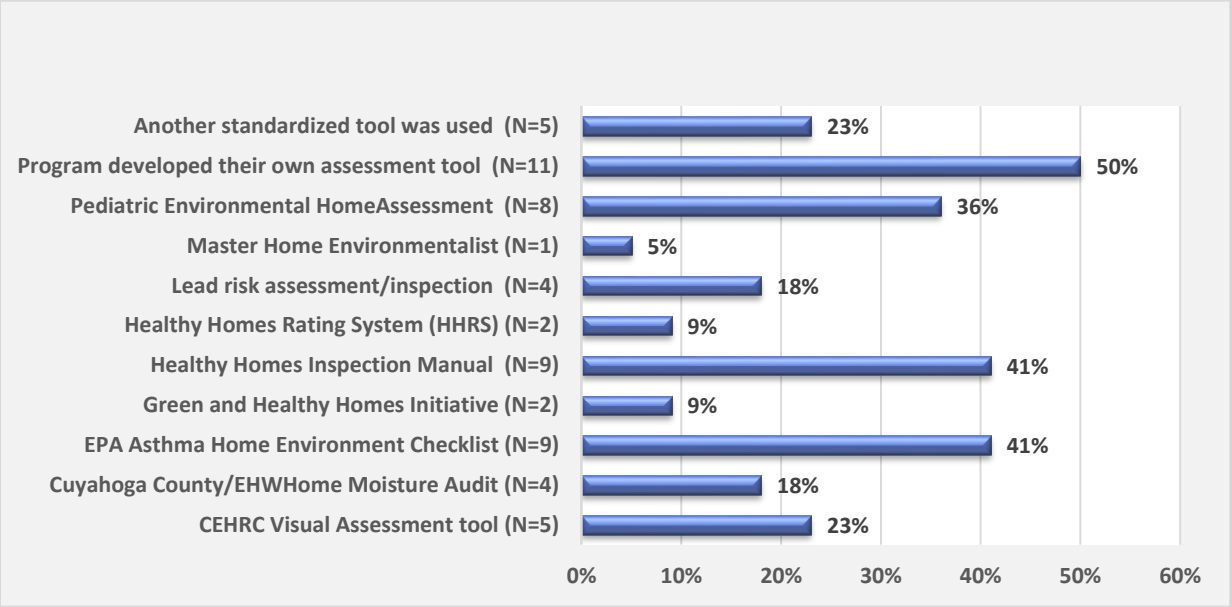
The majority of grantees (88%, N=22) used or adapted a standardized visual assessment tool. The majority (50%) also reported a need to develop their own tool. The most commonly used visual assessment tools included the CDC/HUD *Healthy Homes Inspection Manual* (41%), the EPA Asthma Home Environment Checklist (41%), and the Pediatric Environmental Home Assessment (36%). (See Figure 3.3.) It should be noted a large number of the grantees (i.e., those with grants issued from FY 2005 – FY 2009) did not have access to the Healthy Homes Rating System (HHRS) and the Green and Healthy Homes Initiative (GHHI) tools. Only 9% (N=2) reported use of either tool, although both are now widely used.

In developing their programs' own assessment tools, grantees incorporated state sanitary codes, as well as widely used and accepted municipal level tools. Some grantees had tools previously developed from prior grants and continued to use them. Other standardized tools with modification included:

1. Seattle King County Healthy Homes;
2. Weatherization Pollution Source form;

3. National Center for Healthy Housing (NCHH) tool to examine 29 potential hazards on a room-by-room basis. The tool details specific structural hazards, safety hazards, lead hazards, and health hazards. Each potential hazard is rated as low, medium or high. Room by room data is used to create a summary score for each hazard for the entire housing unit;
4. Baltimore Health Department's Healthy Homes Visual Inspection, Boston University's Pediatric Asthma-Allergy Home Assessment, the National Environmental Education and Training Foundation's tool;
5. Perceived Street Scale (PSS); and
6. Remediation Prescription Checklist (RPC). (See Table 5.A, Appendix 2.)

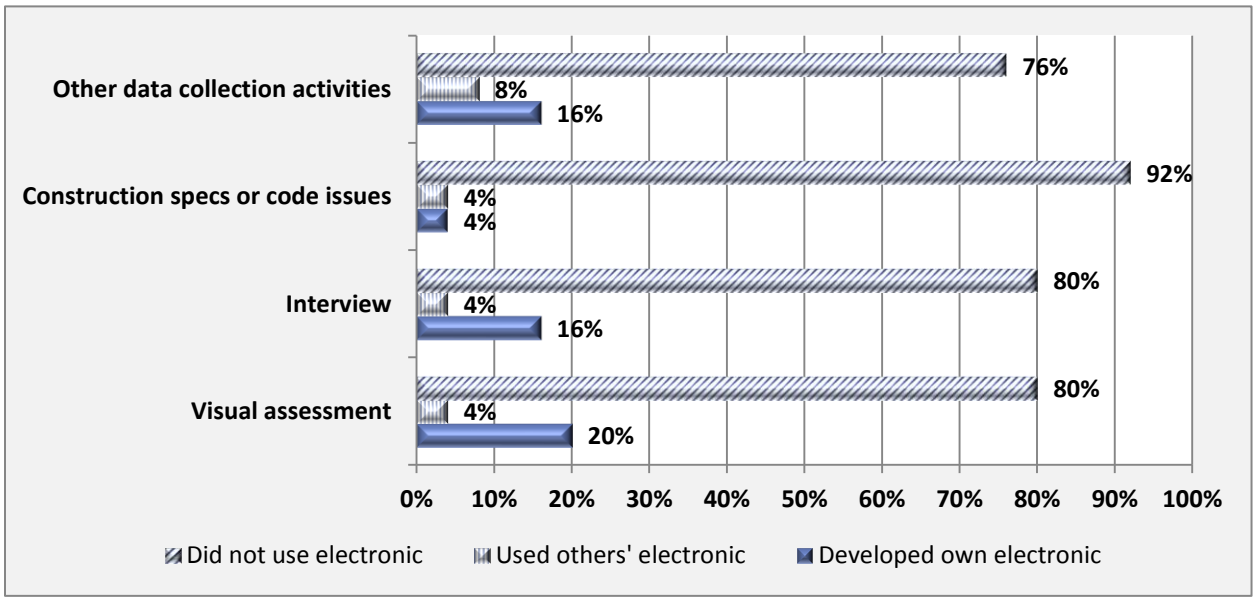
FIGURE 3.3: COMMONLY USED STANDARDIZED VISUAL ASSESSMENT TOOLS (N=22)



Very few grantees reported the use of electronic data collection tools for visual assessments, interviews, construction specifications and code assessments, or other purposes. Although few developed their own electronic tools, those that did applied them to visual assessments, resident interviews, or other purposes. (See Figure 3.4.) Lack of Internet connectivity in the field was a common issue for many who attempted to use electronic tools. One grantee developed a very sophisticated data management

system to integrate their data across multiple programs. (See Table 3.A Appendix 2 for additional grantee comments.)

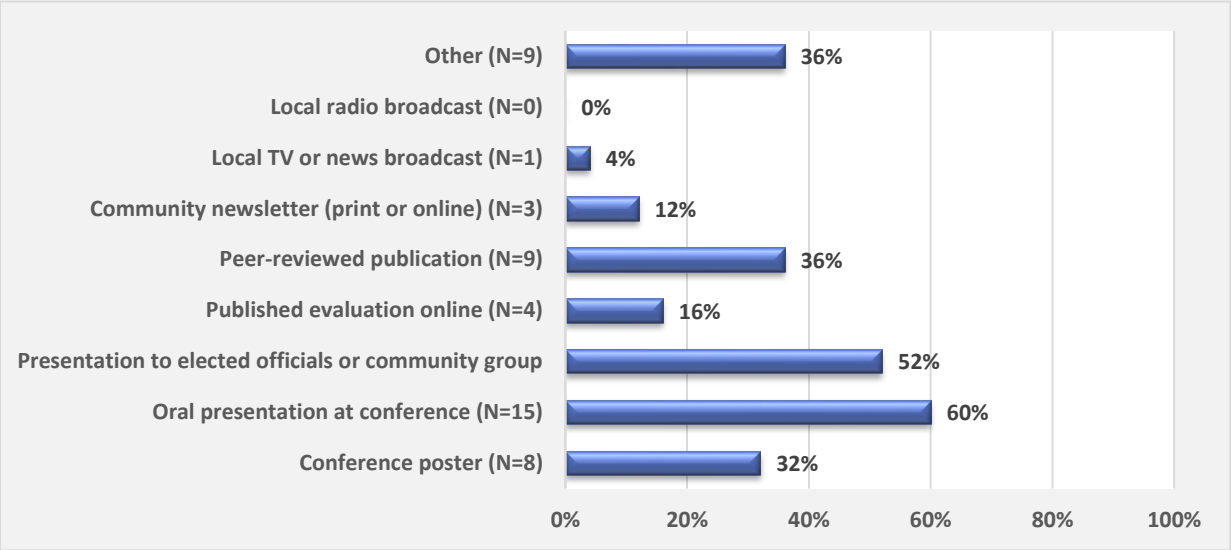
FIGURE 3.4: GRANTEES USING ELECTRONIC DATA COLLECTION TOOLS (N=25)



3.5 DISSEMINATION STRATEGIES

Of nine possible dissemination strategies, grantees reported a mean use of 3.0 tools, with a minimum of one and a maximum of seven. The most common methods reported were presentations at conferences (60%), presentations to elected officials (52%), and peer-reviewed publications or other strategies (36%). (See Figure 3.5.)

FIGURE 3.5: PERCENTAGE OF GRANTEES REPORTING USE OF DIFFERENT DISSEMINATION STRATEGIES (N=25)



This resulted in 18 publications, with at least four more in publication review. (See Table 3.7.) In addition, data from several of the projects have been incorporated into HUD OLHCHH Technical Studies grants or other new research initiatives. It was not possible to obtain an exact count of presentations delivered at professional or other conferences, but more than 100 were delivered to audiences such as the following:

1. International Society for Indoor Air Quality;
2. American Academy of Allergy, Asthma, and Immunology (presentation abstracts published in the *Journal of Asthma and Clinical Immunology);*
3. American Public Health Association;
4. American Society of Heating Refrigeration and Air Conditioning Engineers;
5. American Industrial Hygiene Conference and Exposition;
6. Indoor Air Quality Association;
7. National Technical Association, Inc.;
8. American Association of Medical Colleges;
9. HUD OLHCHH National Healthy Homes Conference (2011 and 2014);
10. HUD OLHCHH Program Manager's meetings (multiple);

11. EPA Children's Environmental Health Work Group;
12. EPA Tribal Air Quality Forum;
13. EPA- and HUD-sponsored webinars on case management, Medicaid reimbursement, and data management systems;
14. EPA Asthma Community Network;
15. Statewide asthma coalitions and regional asthma summits;
16. State and local Boards of Health;
17. State-level Public Health or Environmental Health Associations;
18. State-level Lead and Healthy Homes conferences;
19. Community Health Networks;
20. Continuing education classes for nurses and other public health professionals;
21. Midwest Workshop on Environmental Health;
22. Ohio Hispanic Coalition; and
23. University Schools of Public Health forums.

Grantees also noted that their publications, or related materials, are listed on their websites.

TABLE 3.7: GRANTEE PUBLICATIONS IN PEER-REVIEWED JOURNALS

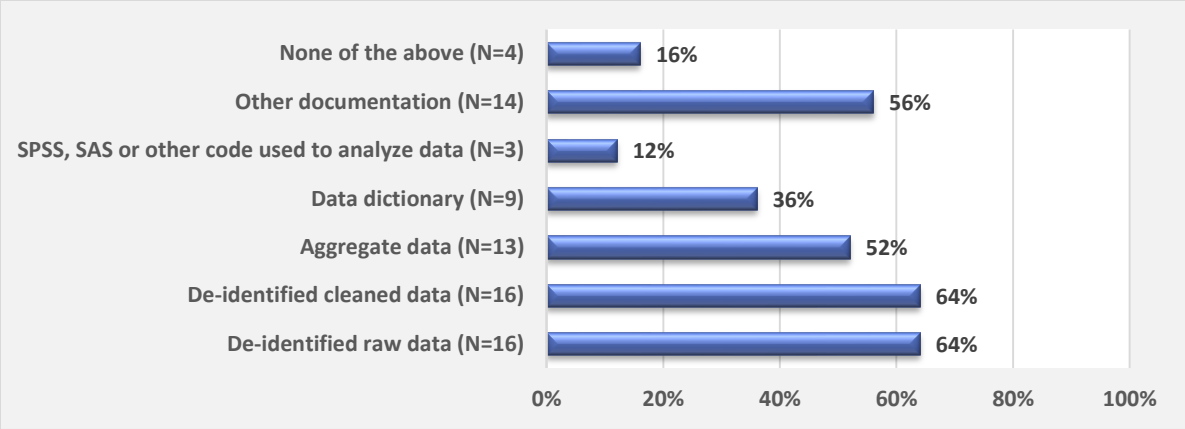
Publication
Amado, M, Kennedy K, Barnes C and Portnoy J. Home environmental factors as predictors of allergic symptoms. *Journal of Allergy and Clinical Immunology,* February 2005, Supplement, Vol. 115, No. 2: S96
Amado, M, Pacheco F, Kennedy K, Johnson L and Barnes C. Environmental factors found in homes of asthmatics. *Journal of Allergy and Clinical Immunology*, February 2006, Vol. 117, No. 2 (Supplement): S31.
Amado M, Pacheco F, Gard L, Forrest E, Johnson L, Barnes C., Home cleaning awareness improves asthma quality of life. *Journal of Allergy and Clinical Immunology*, January 2007, Vol. 117: S189.
Barnes C, Portnoy J, Ciaccio CE, and Pacheco FA. Comparison of subject room dust with home vacuum dust for evaluation of dust-borne aeroallergens. *Annals of Allergy, Asthma & Immunology*. Accepted for publication 2-10-2013
Breysse, J, Dixon, S, Gregory, J, Philby M, Jacobs, DE, and Krieger, J. Effect of weatherization combined with Community Health Worker in-home education on asthma control. *American Journal of Public Health*: January 2014, Vol. 104, No. 1: e57–e64.
Ciaccio, CE, Hu F, Pacheco F, Amado M, Portnoy J, Barnes C. Comparison of viable and non-viable indoor airborne fungal spore collections. *The Journal of Allergy and Clinical Immunology*, February 2008, Vol. 121, No. 2: S179

Johnson L, Ciaccio C, Barnes C, Kennedy K, Forrest E, Pacheco F, Dowling, P and Portnoy J. Low cost interventions improve indoor air quality and children's health. *Allergy Asthma Proc.* 2009 Jul-Aug, Vol. 30, No. 4: 377-85.
Jacobs DE, J Breysse, SL Dixon, S Aceti, C Kawecki, M James, J Wilson. 2014. Health and Housing Outcomes From Green Renovation of Low-Income Housing in Washington, DC. ***J Environmental Health*** 76(7): 8-16.
Nriagu J, Smith P, Socier D. A rating scale for housing-based health hazards. *Sci Total Envir,* 2011, Vol. 409, No. 24: 5423-5431.
Nriagu J, Martin J, Smith P, Socier D. Residential hazards, high asthma prevalence and multimorbidity among children in Saginaw, Michigan. *Sci Total Envir*, February 2012, Vol. 416, No. 1: 53-61
Pacheco F, Barnes C, Johnson L, Kennedy K and Portnoy J. Comparison of results for rapid and EIA based dust mite determinations. *Journal of Allergy and Clinical Immunology*, February 2005, Supplement, Vol. 115, No. 2: S97 Abstract 389.
Serota M, Meng J. Barnes C. The relationship of sensitization and specific IgE with age in a pediatric population with asthma. *Journal of Allergy and Clinical Immunology*, February 2011, Supplement, Vol. 127, Issue 2: AB176. Abstract 673
Sweet LL1, Polivka BJ, Chaudry RV, Bouton P. The impact of an urban home-based intervention program on asthma outcomes in children. *Public Health Nurs*. 2014 May-Jun; 31(3):243-52. doi: 10.1111/phn.12071. Epub 2013 Aug 13 (asthma data only)
Turcotte, D.A., H. Alker, E. Chaves, R. Gore, and S. Woskie. Healthy homes: in-home environmental asthma intervention in a diverse urban community. *American Journal of Public Health*; April 2014, Vol. 104, No. 4.
Vesper S, Barnes C, Ciaccio CE, Johanns A, Kennedy K, Murphy JS, Nunez-Alvarez A, Sandel MT, Cox D, Dewalt G, Ashley PJ., Higher Environmental Relative Moldiness Index (ERMI) Values Measured in Homes of Asthmatic Children in Boston, Kansas City, and San Diego, *Journal of Asthma*, 2012, [Epub ahead of print] PMID: 23137280
Wagoner, K, MS, L Johnson MS, F Pacheco MS, J Portnoy, MD and C Barnes, PhD., Fungal Ergosterol Levels in Typical Homes, ***Journal of Allergy and Clinical Immunology***, February 2006, Vol. 117, Iss. 2 (Supplement), #106 (abstract).
Ward DR, Dowling P, Hu F, Johnson L, Kennedy K, Barnes C., Reduction in Aspergillus and Penicillium spore counts results in reduction of Aspergillus and Penicillium antigen level in house dust. *Journal of Allergy and Clinical Immunology*, January 2007, Vol. 117: S189.
Zickafoose, J, Greenberg S, Dearborn DG. Teaching home environmental health to resident physicians. *Public Health Reports*, 2011, 126 Suppl 1:7-13. [a journal of the Center for Disease Control and Prevention]

3.6 CAPACITY TO SHARE DATASETS WITH HUD OLHCHH FOR FUTURE ANALYSIS

The majority of grantees could share de-identified raw or cleaned datasets with HUD (64%), other documentation (56%) or aggregate data (52%). (See Figure 3.6.)

FIGURE 3.6: ABILITY TO SHARE DATASETS WITH HUD (N=25)



Limitations in data sharing with HUD OLHCHH included restrictions associated with the need for additional IRB and/or HIPAA (Health Insurance Portability and Accountability Act) clearance; a concern that release of this information could affect the approval of manuscripts undergoing peer-review; and lack of staff to provide these data. (See Table 3.8.)

TABLE 3.8: ADDITIONAL GRANTEE COMMENTS ON DATA SHARING WITH HUD OLHCHH

Responses
We still have the quarterly reports (raw) that we did, a spreadsheet of events attended, people reached, etc. I am the last employee left from when we implemented the Healthy Homes Program. If we don't receive funding for a grant we are currently writing, most likely I will be laid off and it will be very difficult to access all aspects of this information in an effective manner. I am not sure if our evaluator will be willing to share their access database, but they have been very accommodating and helpful with our programs up to date.
Because this is an open IRB protocol, sharing of data at this time may be complicated. It is currently planned to place all data from HUD grant activity into an environmental data repository and at that time a request for copies of data and other documentation can be requested…
[It] would take a significant amount of time to explain data for it to be meaningful; we may still have cleaned data that only focuses on asthma that we used for journal article that may be more useful.
All our data information has personnel information and is not de-identified. We were not asked, by HUD, to store as such.
Asthma outcome spreadsheet could be de-identified. Housing data (questionnaires, VAT, interview) could be de-identified.
Our IRB and informed consent has limited us to aggregate data, but a data use agreement could be written to include de-identified data and presented to the IRB.
As a sub-grantee … provided referrals, health education and technical expertise for home-related interventions

and case management for children with asthma, developed and administered the screening/assessment tools, and engaged the … to evaluate the program. We will contact PCH management to determine if this data is currently available and accessible.
Yes, with proper HIPAA and privacy agreements executed as appropriate to protect any confidential medical information. HHD Program data is maintained in a Social Solutions Efforts to Outcomes (ETO) client database.
Written narrative of what is being peer reviewed is available upon request.
However, before any data can be shared, the tribal IRB would have to approve it.
We would have to select which tables of data we could or could not share, Not sure what you mean by cleaned data. Not sure what a data dictionary is. We don't have any analytic data, code, or software that could be shared.
We can share the Final Evaluation Report and other presentation materials, and community reports that are in progress.

CHAPTER 4: RECRUITMENT, ENROLLMENT, PARTNERSHIPS, AND COMMUNITY OUTREACH

4.1 OVERVIEW

Most grantees reported that their projects involved recruitment or enrollment of clients (88%) and/or housing units (64%). Overall, more than 17,000 clients and over 3,000 housing units were enrolled by grantees. The primary targets included families or individuals with or at-risk for asthma and housing units within specific census tracts or geographical boundaries.

Grantees used a variety of recruitment methods to enroll participants. As shown in Figure 4.3, the most common methods included recruiting from community meetings, health fairs, or community events.

4.2 SUMMARY OF INDIVIDUALS TARGETED

The majority of grantees (88%, N=22) reported having targeted individuals for their program.

The most commonly targeted groups were: 1) low-income families (88%); 2) families or individuals with or at-risk for asthma (84%); and 3) minority families (72%). Additionally, a majority of the programs targeted renters/tenants (68%), families with children under the age of 18 years (68%), and families with children under the age of six years (64%). (See Figure 4.1).

Of the target groups, the three with the highest rating as primary targets were: 1) families or individuals with or at-risk for asthma (80%); 2) low-income families (68%); and 3) families with children under the age of 18 years (56%). Frequently mentioned secondary targets included: 1) families with children with or at-risk for lead poisoning and owner-occupants (48% each); 2) families or individuals with or at-risk for other conditions and renters (40% each); and 3) disabled residents (28%). (See Table 4.1.)

FIGURE 4.1: TARGET GROUPS REPORTED (N=25)

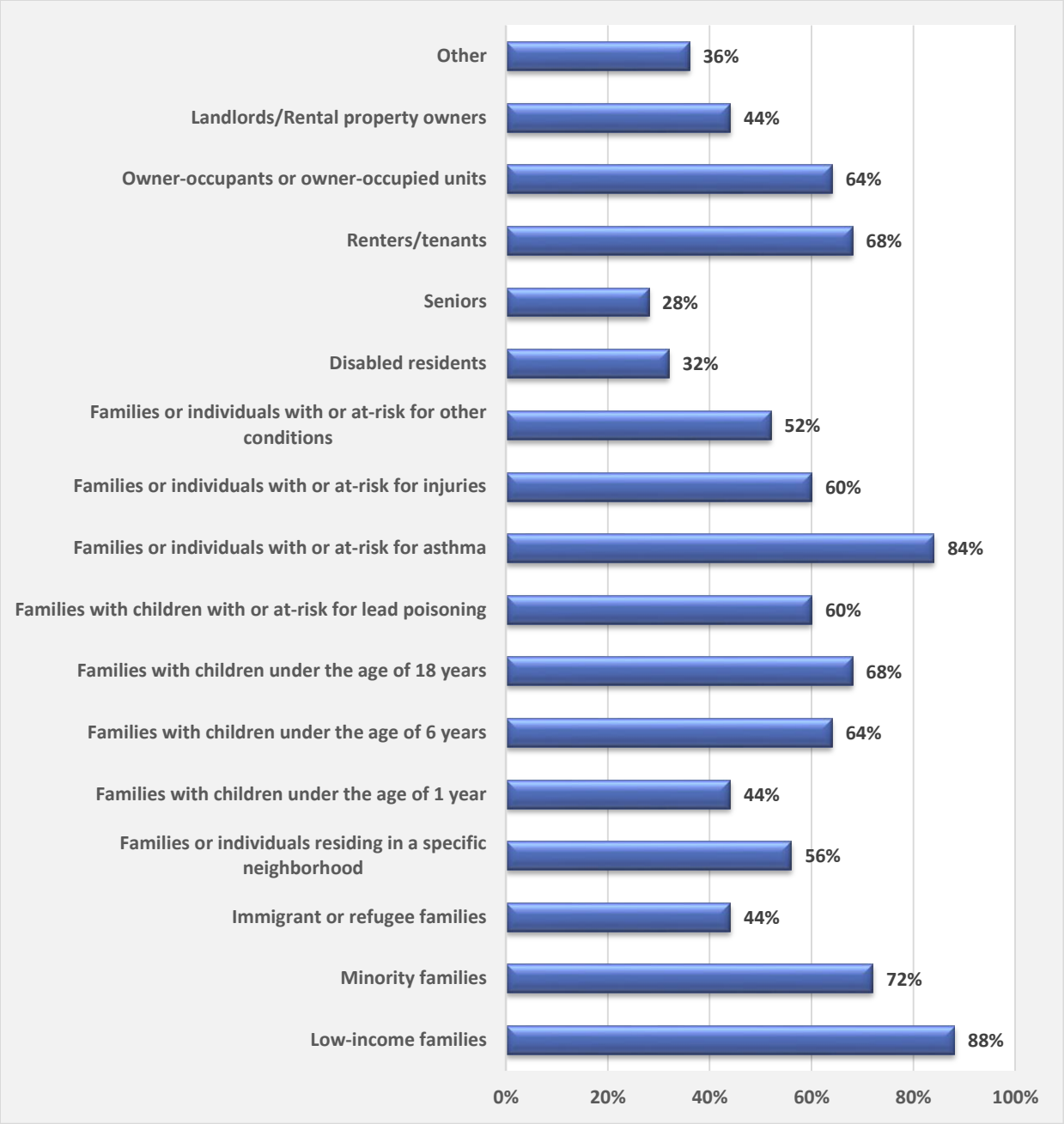


TABLE 4.1: RATING OF GROUPS AS PRIMARY OR SECONDARY TARGETS FOR RECRUITMENT

Target groups	Rating as primary or secondary		
	N	Primary (N)	Secondary (N)
Low-income families	22	68% (17)	20% (5)
Minority families	18	36% (9)	36% (9)
Immigrant or refugee families	11	20% (5)	24% (6)
Families or individuals residing in a specific neighborhood	14	36% (9)	20% (5)
Families with children under the age of one year	11	24% (6)	20% (5)
Families with children under the age of six years	16	40% (10)	24% (6)
Families with children under the age of 18 years	17	56% (14)	12% (3)
Families with children with or at-risk for lead poisoning	15	12% (3)	48% (12)
Families or individuals with or at-risk for asthma	21	80% (20)	4% (1)
Families or individuals with or at-risk for injuries	15	24% (6)	36% (9)
Families or individuals with or at-risk for other conditions	13	12% (3)	40% (10)
Disabled residents	8	4% (1)	28% (7)
Seniors	7	16% (4)	12% (3)
Renters/tenants	17	28% (7)	40% (10)
Owner-occupants or owner-occupied units	16	16% (4)	48% (12)
Landlords/Rental property owners	11	12% (3)	32% (8)
Other	9	36% (9)	0% (0)

4.3 SUMMARY OF HOUSING UNITS TARGETED

Housing units were targeted by 64% (N=16) of the grantees.

The most frequently targeted housing units were: 1) units located in a specific neighborhood or defined geographical boundary (e.g., census tract) (64%); 2) rental units (48%); and 3) single-family units (48%). Least likely to be targeted are childcare (12%), foster care (8%), and supportive housing (0%). (See Figure 4.2.) In addition to the types of housing units specified in the survey, grantees mentioned Section 8

housing, tribal housing, and recruiting from partner programs or individuals with respiratory conditions within the targeted housing units. (See Table 4.2.)

Of the housing units targeted, the four with the highest rating as primary were: 1) units located in a specific neighborhood or defined geographical boundary (e.g., census tract) (60%); 2) rental units (36%); 3) units built prior to 1978 (28%); and 4) multifamily units (28%). The three with the highest rating of secondary were: 1) single-family units (24%); 2) units participating in another health or housing program (24%); and 3) public housing units (20%). (See Table 4.3.)

FIGURE 4.2: TARGET HOUSING UNITS REPORTED (N=25)

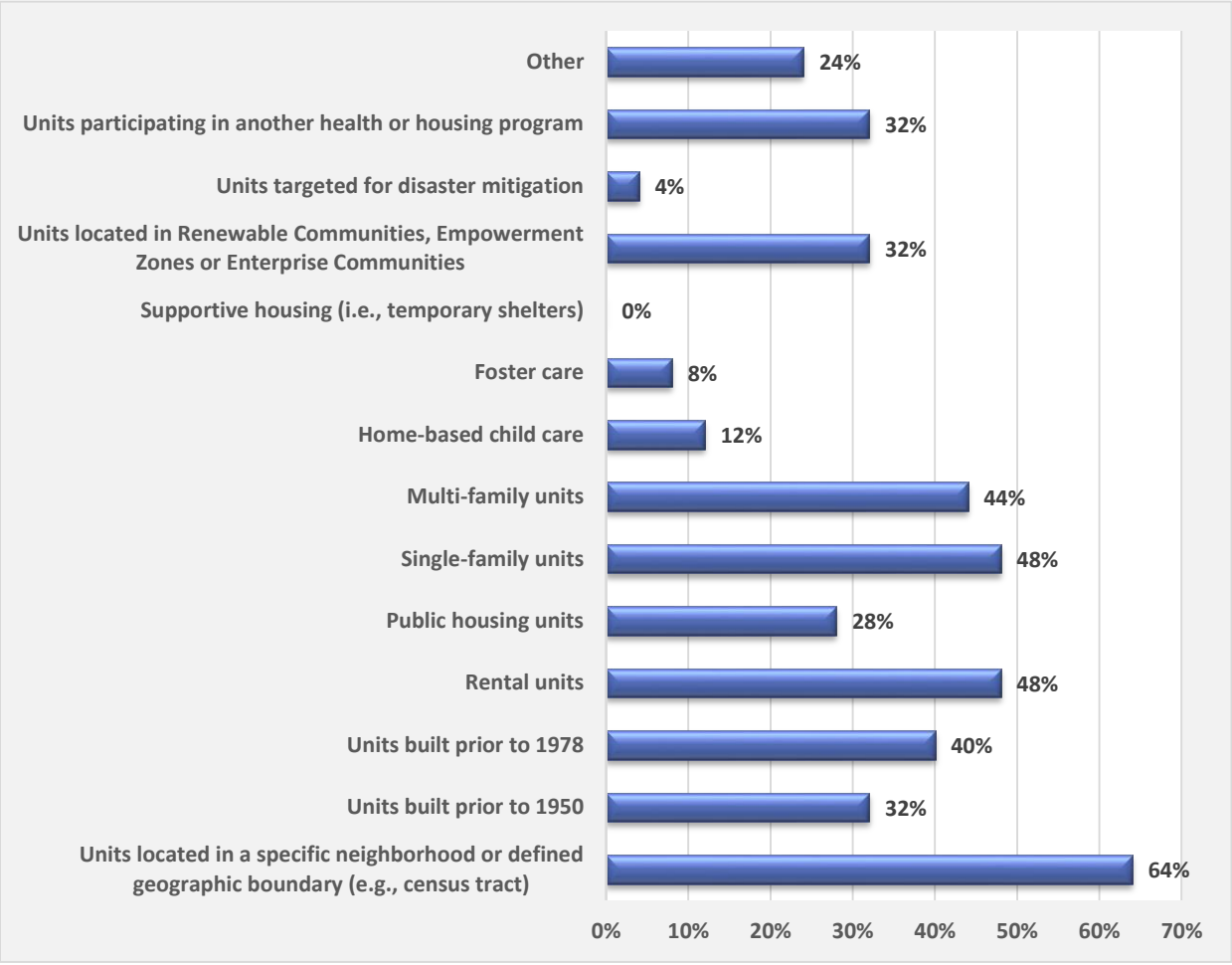


TABLE 4.2: ADDITIONAL GRANTEE COMMENTS ON HOUSING UNITS TARGETED

Responses
Section 8 housing.
To clarify: In weatherization we consider a single family building 1 to 4 units. Any building with 5 or more units is considered multi-family.
Program participants were primarily recruited/referred from the Long Beach Alliance for Children with Asthma as they provide asthma case management program for children with asthma.
Units participating in partner programs (weatherization & energy programs, renovation and repair, lead hazard control).
Tribal housing.
The primary target were individuals with chronic respiratory health conditions living in the targeted housing that could qualify for HWAP. There were occasions where the client was first recruited into HWAP and then brought into healthy homes based upon their health condition. The Cleveland and Cuyahoga Healthy Homes Initiative 3 (CCHHI3 partnered with existing Weatherization Programs, managed by the Cleveland Housing Network (CHN) and the Cuyahoga County Department of Development (DOD), to provide an integrated approach to asthma trigger reduction. The goal of the CCHHI3 was to infuse these Healthy Homes considerations into Weatherization, utilizing the existing infrastructure and recruited through an affordable housing provider (CHN), to improve energy efficiency while at the same time improving the IAQ to benefit children and senior citizens suffering from chronic respiratory disease. Sixty -six (66) units were completed in the City of Cleveland and the remaining thirty- eight (38) units were completed in the first ring suburbs.

TABLE 4.3: RATING OF HOUSING UNITS AS PRIMARY OR SECONDARY TARGETS FOR RECRUITMENT

Target housing units	Rating of housing units as primary or secondary targets for recruitment		
	N	Primary (N)	Secondary (N)
Units located in a specific neighborhood or defined geographic boundary (e.g., census tract)	16	60% (15)	4% (1)
Units built prior to 1950	8	16% (4)	16% (4)
Units built prior to 1978	10	28% (7)	12% (3)
Rental units	12	36% (9)	12% (3)
Public housing units	7	8% (2)	20% (5)
Single-family units	12	24% (6)	24% (6)
Multi-family units	11	28% (7)	16% (4)
Home-based child care	3	4% (1)	8% (2)
Foster care	2	4% (1)	4% (1)

Target housing units	Rating of housing units as primary or secondary targets for recruitment		
Supportive housing (i.e., temporary shelters)	0	0% (0)	0% (0)
Units located in Renewable Communities, Empowerment Zones or Enterprise Communities	8	24% (6)	8% (2)
Units targeted for disaster mitigation	1	0% (0)	4% (1)
Units participating in another health or housing program	8	8% (2)	24% (6)
Other	6	20% (5)	4% (1)

4.4 RECRUITMENT METHODS AND INCENTIVES

Grantees reported a variety of methods to recruit clients for their programs. When asked to assess 18 different recruitment methods, grantees reported a mean of 7.8 methods used, with a minimum of five and a maximum of 14 (N=24).

The most frequently used methods of recruitment were: 1) community meetings, health fairs, or community events (96%); 2) referrals from health care providers and mailings or distribution of materials to local organizations (88%, respectively); and 3) referrals from agencies and organizations (84%). (See Figure 4.3.) In addition to those methods specified in the survey, grantees mentioned the use of email blasts from partner websites, contacts with home visiting nurses who worked with asthma patients, information tables in the common areas of multi-unit buildings, use of the 211 Call for Help information Line, and random digit dialing recruitment calls. Two programs mentioned word of mouth.

Of the methods used, the four that the majority of grantees rated as very effective were: 1) referrals from health care providers (73% rated as very effective); 2) referrals from other organizations (57%); 3) mailings or distribution of materials to organizations and/or community groups (55%); and 4) community meetings, health fairs, or community events or other methods (50%). (See Table 4.4.) Although rarely used, newspaper advertisements were rated as least effective (40%).

FIGURE 4.3: RECRUITMENT METHODS REPORTED (N=25)

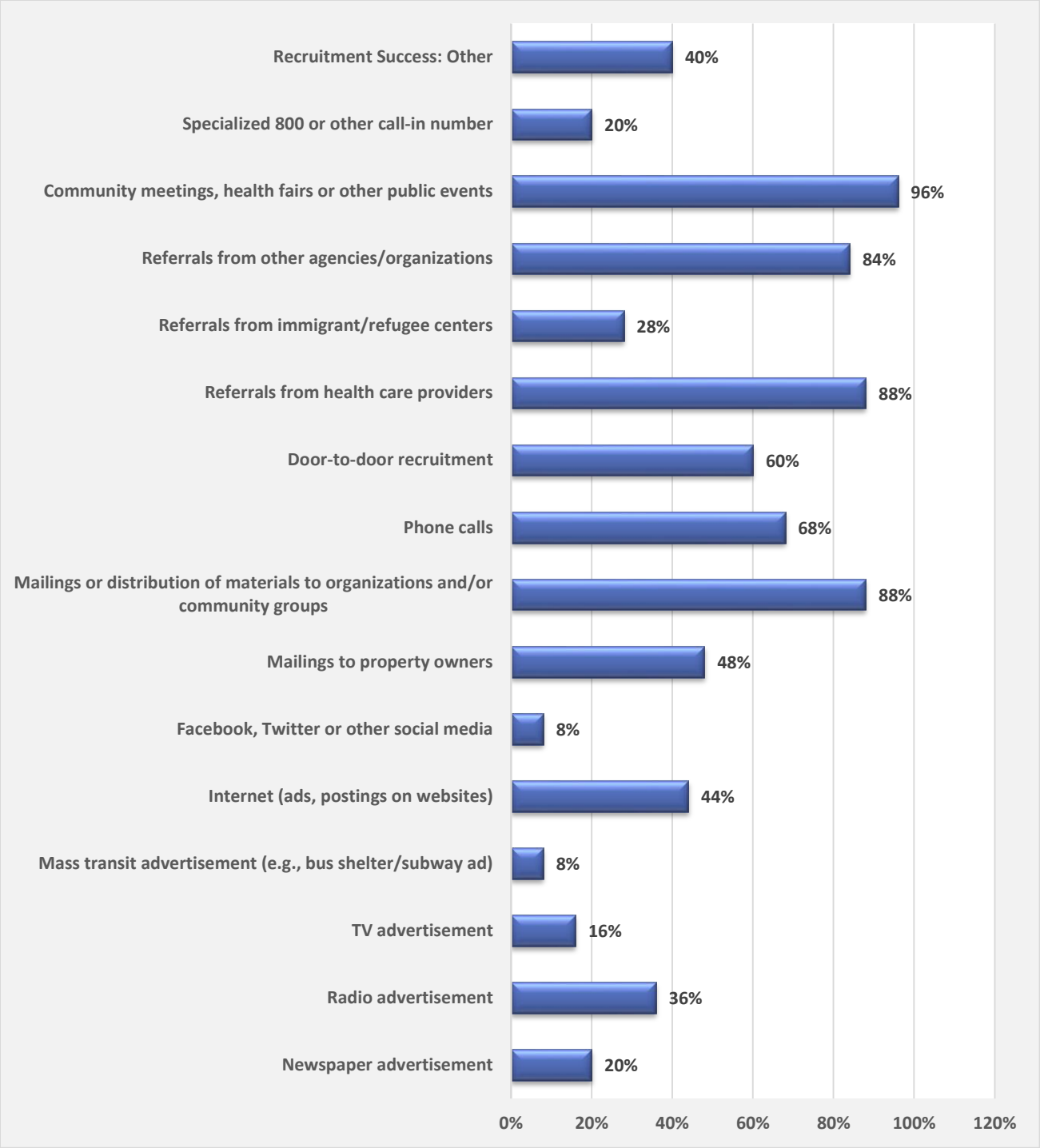


TABLE 4.4: RATING OF EFFECTIVENESS OF RECRUITMENT METHOD USED*

Method	Rating of Effectiveness of Method Used			
	N	Not effective (N)	Somewhat effective (N)	Very effective (N)
Newspaper advertisement	5	40% (2)	60% (3)	0% (0)
Radio advertisement	9	0% (0)	89% (8)	11% (1)
TV advertisement	4	0% (0)	75% (3)	25% (1)
Mass transit advertisement (e.g., bus shelter/subway ad)	2	0% (0)	100% (2)	0% (0)
Internet (ads, postings on websites)	11	27% (3)	64% (7)	9% (1)
Facebook, Twitter or other social media	2	50% (1)	50% (1)	0% (0)
Mailings to property owners	12	17% (2)	67% (8)	17% (2)
Mailings or distribution of materials to organizations and/or community groups	22	5% (1)	41% (9)	55% (12)
Phone calls	17	12% (2)	71% (12)	18% (3)
Door-to-door recruitment	15	13% (2)	47% (7)	40% (6)
Referrals from health care providers	22	9% (2)	18% (4)	73% (16)
Referrals from immigrant/refugee centers	7	0% (0)	100% (7)	0% (0)
Referrals from other agencies/organizations	21	5% (1)	38% (8)	57% (12)
Community meetings, health fairs or other public events	24	8% (2)	42% (10)	50% (12)
Specialized 800 or other call-in number	5	0% (0)	100% (5)	0% (0)
Recruitment Success: Other	10	20% (2)	30% (3)	50% (5)

- Note: Each item asked separately; N= those respondents who answered each item.

The majority of grantees (84%, N=21) reported using incentives to recruit, enroll, or retain clients. Grantees reported a mean of 2.6 incentives used with a minimum of one and a maximum of four. Of the incentives used, the most common were: 1) products/giveaways (90%); 2) interventions (67%); and 3) gift certificates (52%). (See Figure 4.4.) In an effort to retain enrollment throughout the program, a raffle was held at a community empowerment meeting and clients received incentives at completion of the program. (See Table 4.5.) The mean value of incentives per household fell between $100.00 and $499.00

(43%, N=9). (See Table 4.6.) The majority of grantees (80%, N=20) reported that the incentives offered were effective both in recruiting clients and in retaining clients (i.e., keeping clients enrolled).

FIGURE 4.4: INCENTIVES USED TO RECRUIT, ENROLL, OR RETAIN CLIENTS (N=21)

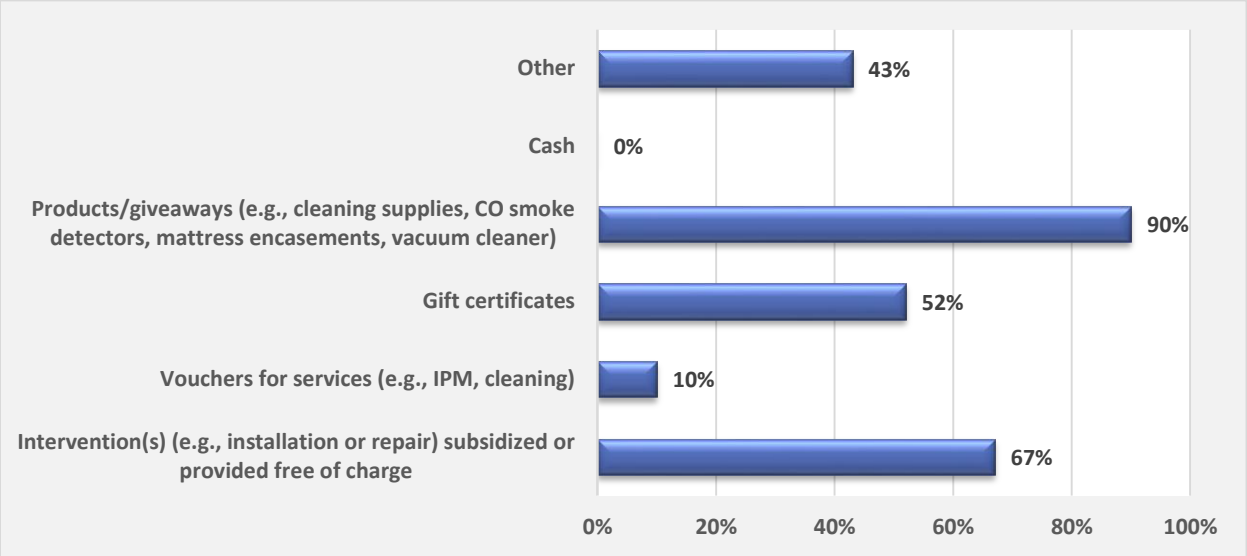


TABLE 4.5: INCENTIVES USED "OTHER" RESPONSES

Recruitment incentives responses
Window guards giveaway.
Raffle at Community Empowerment Meetings for enrolled clients to encourage continued participation. Prizes were $10 gift cards to a dollar store.
Clients received services and products based on what their identified needs were. At the last visit we started giving out $25 gift cards to our Fred Meyer store to replenish green cleaning supplies. We started doing this because, after all the interventions had been done, it was harder to schedule final visits, which we needed to do to complete the post-assessment.
Incentive products were held until visits complete (HEPA room filters, ACs and Dehumidifiers).
We did not provide vouchers for services, but we did offer free cleanings and IPM if needed.
The products were installed by the program to ensure proper use. IPM, cleaning, etc. was contracted and delivered by the program to ensure proper use.
Standard Group was given cleaning supplies and gift cards for completing the program ($100-$499). Intensive Group was given cleaning supplies, gift cards, vacuum, and completed repairs in their homes/property ($500 or

more).
IPM and cleaning were included in interventions done in the units.
Each family that completed their home assessment report delivery process received a healthy home kit. Gift card received at end of their participation in the program if family participated throughout.

TABLE 4.6: MEAN VALUE OF ALL INCENTIVES PROVIDED PER HOUSEHOLD (N=21)

Mean value of all incentives provided per household	N	Value (N)
Less than $100	21	19% (4)
$100-$499	21	43% (9)
$500-$999	21	14% (3)
$1000 or more	21	19% (4)
Not able to estimate	21	5% (1)

4.5 PARTNERSHIP DEVELOPMENT

In many locations, no single agency has responsibility for dealing with all healthy homes issues. Therefore, effectively addressing healthy homes issues often involves collaboration between several different partner organizations. Almost all of the grantees (96%) formed new partnerships as a result of this project, and close to half of the grantees (40%) formed more than six new partnerships.

Grantees were asked the types of community organizations, stakeholders and partners engaged as part of this project. Partners were defined as organizations, entities or individuals that took an active role in recruiting or providing services, but did not receive payment for services. Subcontractors were paid for their services. Grantees could mention up to 22 organizational types as partners, subcontractors, or both.

The most commonly engaged organizations were: 1) community-based health organization or coalition (92%); 2) healthcare providers (88%); 3) state or local health department (88%); and 4) state or local housing agencies (84%). (See Figure 4.5.) In addition to the organizations mentioned in the questionnaire, grantees specifically engaged with Head Start programs, local fire departments, and local

immigration associations, and subcontracted to a resident to assist with enrollment, education and visual assessment.

If an organization was engaged, the majority of the time it would be as a partner. Nine (9) categories of organizations were engaged solely as partners: 1) childcare providers; 2) code enforcement; 3) early intervention/child education; 4) homeowners association; 5) K-12 schools; 6) landlord association; 7) managed care plans/health plans; 8) other state or local agencies; and 9) WIC (Women-Infants-Children). Three (3) organizations had engagements as subcontractors equal to or greater than partners: 1) local business (50%); 2) translators (61%); and 3) evaluation consultant (85%). (See Table 4.7.)

FIGURE 4.5: ORGANIZATIONS ENGAGED AS PARTNER OR SUBCONTRACTOR (N=25)

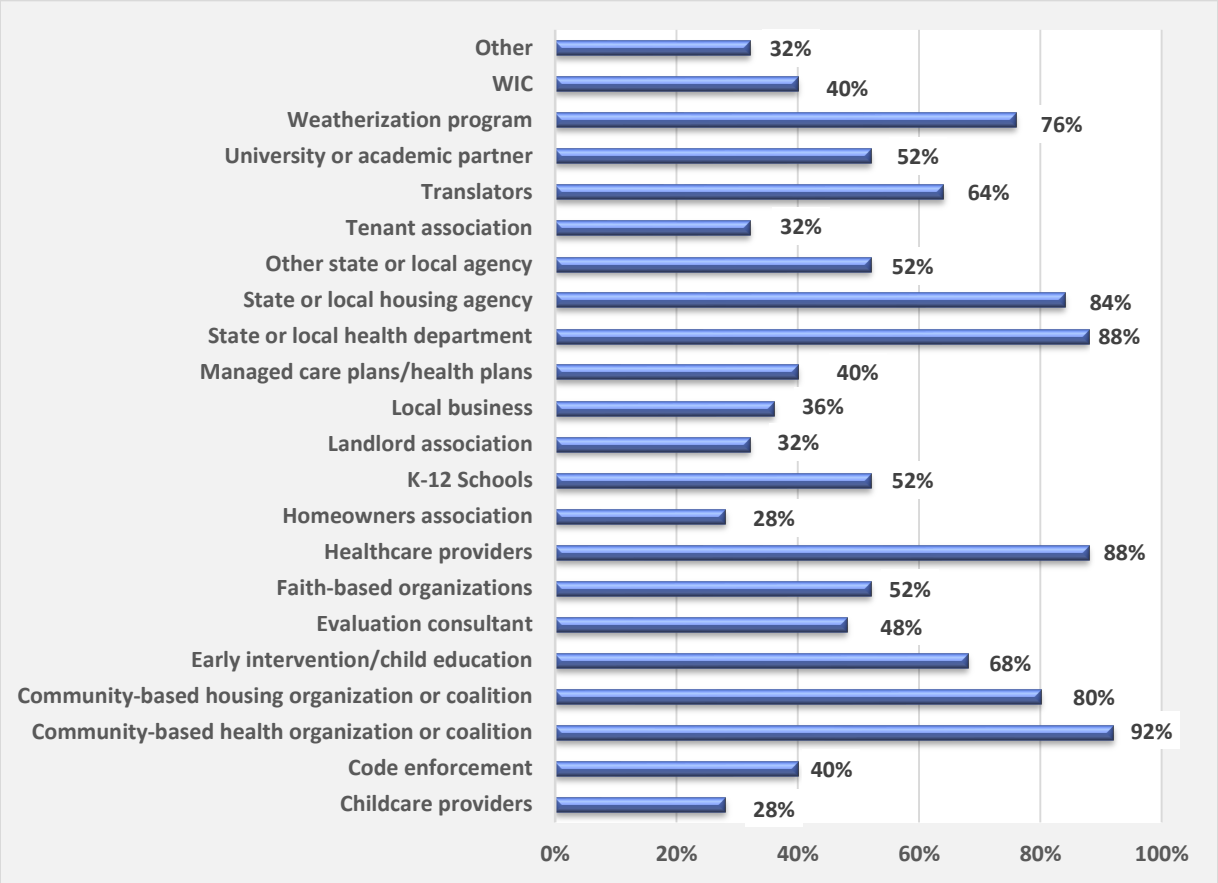


TABLE 4.7: ORGANIZATIONS ENGAGED AS PARTNERS AND/OR SUBCONTRACTORS

Organizations	Partner versus subcontractor		
	N	Partner (N)	Subcontractor (N)
Childcare providers	7	100% (7)	0% (0)
Code enforcement	10	100% (10)	0% (0)
Community-based health organization or coalition	23	83% (20)	17% (4)
Community-based housing organization or coalition	20	71% (17)	29% (7)
Early intervention/child education	17	100% (17)	0% (0)
Evaluation consultant	12	15% (2)	85% (11)
Faith-based organizations	13	86% (12)	14% (2)
Healthcare providers	22	79% (19)	21% (5)
Homeowners association	7	100% (7)	0% (0)
K-12 Schools	13	100% (13)	0% (0)
Landlord association	8	100% (8)	0% (0)
Local business	9	50% (5)	50% (5)
Managed care plans/health plans	10	100% (10)	0% (0)
State or local health department	22	91% (21)	9% (2)
State or local housing agency	21	95% (21)	5% (1)
Other state or local agency	13	100% (13)	0% (0)
Tenant association	8	88% (7)	13% (1)
Translators	16	39% (7)	61% (11)
University or academic partner	13	85% (11)	15% (2)
Weatherization program	19	90% (18)	10% (2)
WIC	10	100% (10)	0% (0)
Other	8	64% (7)	36% (4)

Almost all of the grantees (96%, N=25) formed new partnerships, with 40% of grantees having formed more than six, as a result of this project. (See Figure 4.6.) Most of the grantees (88%) continued to work with their new partners after the grant ended. (See Figure 4.7.)

FIGURE 4.6: PARTNERSHIPS NEWLY FORMED AS A RESULT OF THIS PROJECT (N=25)

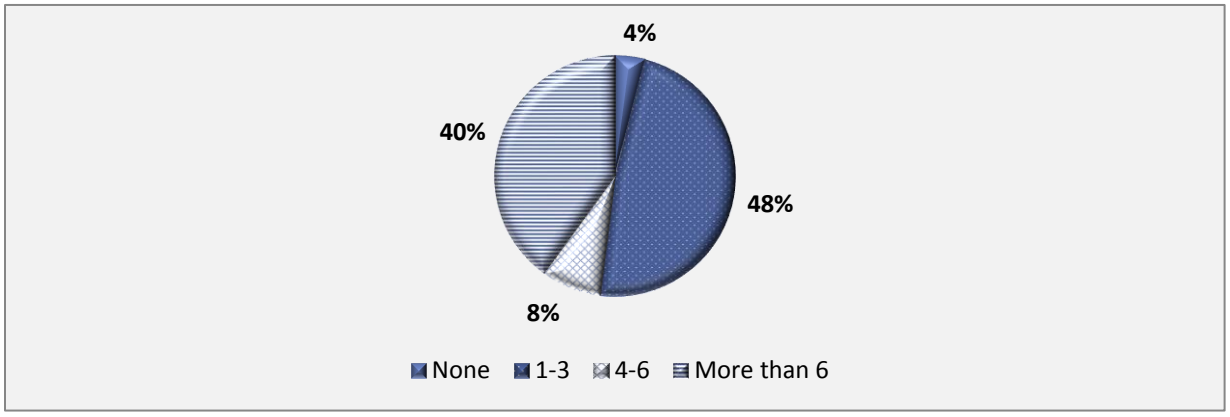
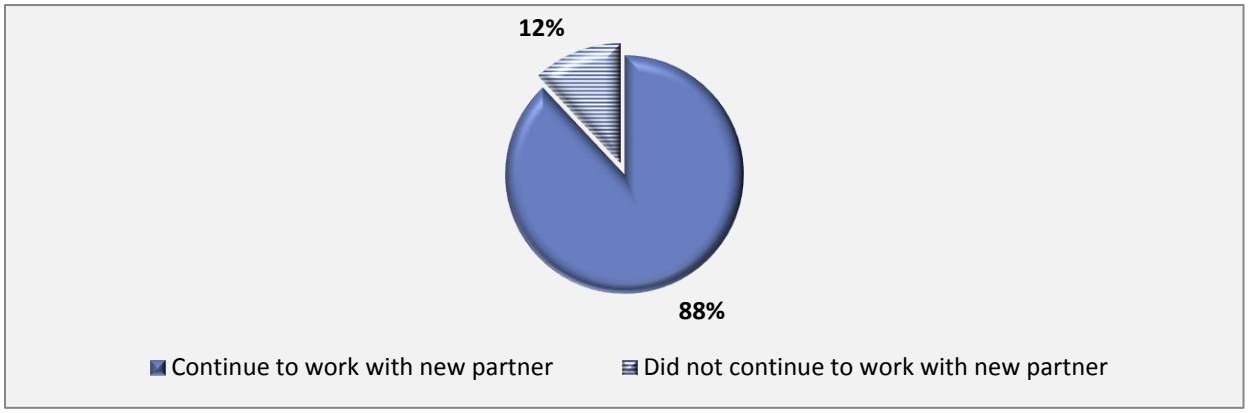


FIGURE 4.7: SUSTAINABILITY OF NEWLY FORMED PARTNERSHIPS (N=25)



4.6 COMMUNITY EDUCATION AND OUTREACH

In addition to education in the context of interventions, the 25 grantees also reported use of a mean of 4.9 of 10 possible community-wide education and outreach methods, a median of five, and a range of two to 10. Grantees estimated that they reached 109,169 individuals through these methods. This may be an underestimation, because grantees had difficulty pinpointing the exact numbers reached through electronic media. The most common methods used included: 1) participation in health fairs (88%); 2) visits to parent or community groups (84%); and 3) visits to health care providers (72%). The least frequently used methods included mass transit advertisements or social media (reported by 8% of grantees, respectively). (See Figure 4.8.)

Of the most commonly used community outreach and education methods, only 32% of grantees who used participation in health fairs method rated this as very effective. Visits to health care providers were rated as very effective by 67% of the grantees that used this method, visits to parent or community groups were rated very effective by 52%, and mailings to community groups were rated very effective by 43%. Although less frequently used, broadcast media outreach, Internet ads or postings, and door-to-door recruitment were rated as very effective (50%, 38%, and 36%, respectively) by the grantees that used them. (See Table 4.8.) Grantees reported they evaluated the effectiveness of community outreach and education by a mean of 2.6 of 8 possible methods, the most common being counts of individuals served (80%) and surveys (40%). (See Table 4.9.) Roughly a quarter of the grantees reported that they did not evaluate the community education and outreach by any of these methods. (See Table 4.10.)

FIGURE 4.8: PERCENT OF GRANTEES REPORTING USE OF DIFFERENT COMMUNITY OUTREACH METHODS (N=25)

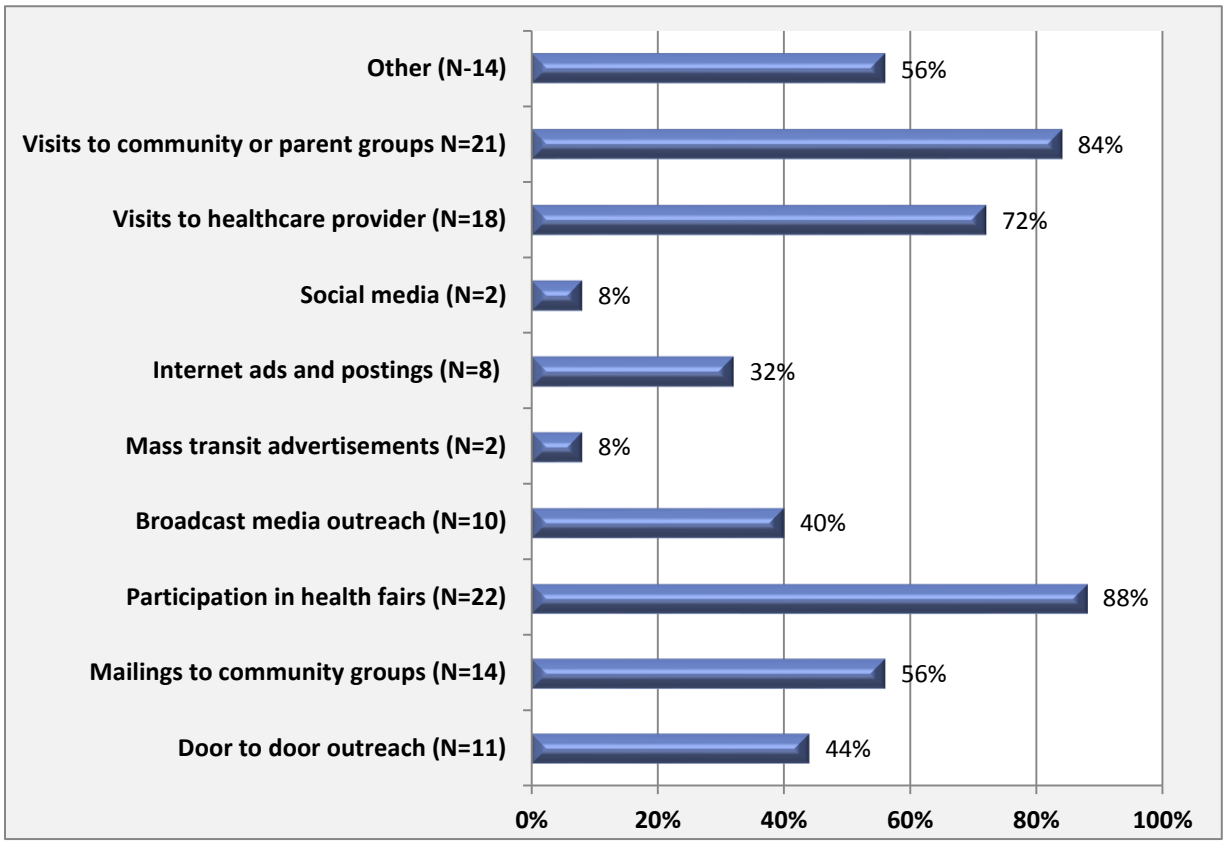


TABLE 4.8: COMMUNITY EDUCATION AND OUTREACH METHODS RATINGS OF EFFECTIVENESS

Community Education and Outreach Methods	N	Rating of Effectiveness		
		Not effective (N)	Somewhat effective (N)	Very effective (N)
Door to door outreach	11	9% (1)	55% (6)	36% (4)
Mailings to organizations and/or community groups	14	7% (1)	50% (7)	43% (6)
Participation in health fairs	22	9% (2)	59% (13)	32% (7)
Broadcast media outreach	10	0% (0)	50% (5)	50% (5)
Mass transit advertisements	2	0% (0)	50% (1)	50% (1)
Internet ads and postings	8	0% (0)	63% (5)	38% (3)
Facebook, Twitter or other social media	2	0% (0)	100% (2)	0% (0)
Visits to primary care provider offices	18	6% (1)	28% (5)	67% (12)
Visits to community or parent groups	21	0% (0)	48% (10)	52% (11)
Other	14	0% (0)	21% (3)	79% (11)

- Note: the majority of the items reported as "other" were elaborations of strategies identified in Table 4.8. Two grantees in this group mentioned "word of mouth" as a recruitment method.

TABLE 4.9: EVALUATION OF COMMUNITY OUTREACH ACTIVITIES (N=25)

How community outreach activities were evaluated?	N	Evaluation method used (N)
We did not track or evaluate any of our community outreach activities	25	24% (6)
Counts of those who were reached	25	80% (20)
Demonstration and return demonstration of techniques (e.g., cleaning)	25	16% (4)
Pre- and Post-tests of knowledge, behaviors or attitudes	25	36% (9)
Surveys/evaluation	25	40% (10)
Self-reported behavior change (or intent to change if signing a pledge)	25	24% (6)
Other (please specify)	25	40% (10)

TABLE 4.10: GRANTEE RESPONSES FOR "OTHER" IN EVALUATION OF COMMUNITY OUTREACH ACTIVITIES

Responses
Number of materials distributed and number of people reached.
Physician-in-training survey: Although our survey was only a small sampling (16/50), all of the medical residents and fellows who went out on the home visits had a positive feeling about the experience. All of them felt they had learned new information about home health and safety hazards during their visits, and had observed certain aspects that will improve the care that they can provide to their patients in the future. In particular, all of them (16/16) described that the experiences have: 1) given them a better understanding of the home environmental hazards, 2) improved their environmental history-taking skills, 3) improved their preventive care, and 4) made them into better advocates for their patients. A similar survey done previously and subsequently described in our publication in Public Health Reports noted that 79% of them had felt the experience had changed how they practiced medicine. In addition to the direct, hands-on experiential training, healthy homes classroom and small group sessions were provided to 361 health professionals, including medical students, medical residents, pediatric pulmonary fellows, MPH students and nursing students.
Number of presentations
Pre- and post-tests of knowledge, behaviors and attitudes, along with return demonstration of techniques during post assessments, were the most revealing and provided confirmation that our efforts had raise awareness.
We are currently funded by the Kresge Foundation to provide a pre/post comparison study using self-reported data and Medicaid medical utilization and prescription fill data. We have also identified a control group.
We kept a quarterly spreadsheet on which we logged our outreach activities. Outreach went from community-based presentations to agencies training sessions with home visitors. On one hand, we counted all individuals reached through our outreach methods; on the other hand, we acknowledged capacity building of the community health workers, home visitors, parents education, etc.
Collected data on source of referral or how clients heard of healthy homes.
Participant sign-in sheets for outreach presentations and events.
Community Education & Outreach Activities Cumulative Total Health & Child Care Providers 88 Schools, Parent Groups, Faith Based 1030 Landlords, Landlord Groups 30 Tenants, Tenant Groups 852 Community or Target Area Wide 1608* Total 3611 * These activities pertain to Asthma Educator Workshops, group education for clients enrolled in the grant as well as door to door outreach and the participation at community based events.
We asked survey participants if they heard of the project and if so where did they heard about it.

CHAPTER 5: ASSESSMENTS AND INTERVENTIONS

5.1 SUMMARY OF VISUAL ASSESSMENTS

Visual assessments were conducted by all of the grantees. Grantees conducted a mean of 2.4 visual assessments per housing unit, with a minimum of one and a maximum of six. Up to seven categories of workers could have conducted visual assessments. The majority of grantees (52%) reported the use of Community Health Workers or promotores to conduct them. (See Figure 5.1.)

Thirteen focus areas could have been routinely addressed during the visual assessments. Baseline visual assessments always were completed for the following four focus areas: 1) fire hazards; 2) moisture problems; 3) pest infestations and/or pesticide use; and 4) presence of mold (N=25 for each focus area). Follow-up visual assessments fell into two categories: always at follow-up and as needed at follow-up. Focus areas with the most follow-up visual assessments were: 1) fire hazards (88%); 2) moisture problems (88%); and 3) presence of mold (88%). (See Table 5.1.) Additionally, grantees also assessed tap water temperature, radon, dust mite conditions, presence of pets, presence of proper ventilation, and all asthma or chronic respiratory condition triggers present in the home. (See Table 5.2.)

FIGURE 5.1: STAFF THAT CONDUCTED VISUAL ASSESSMENTS (N=25)

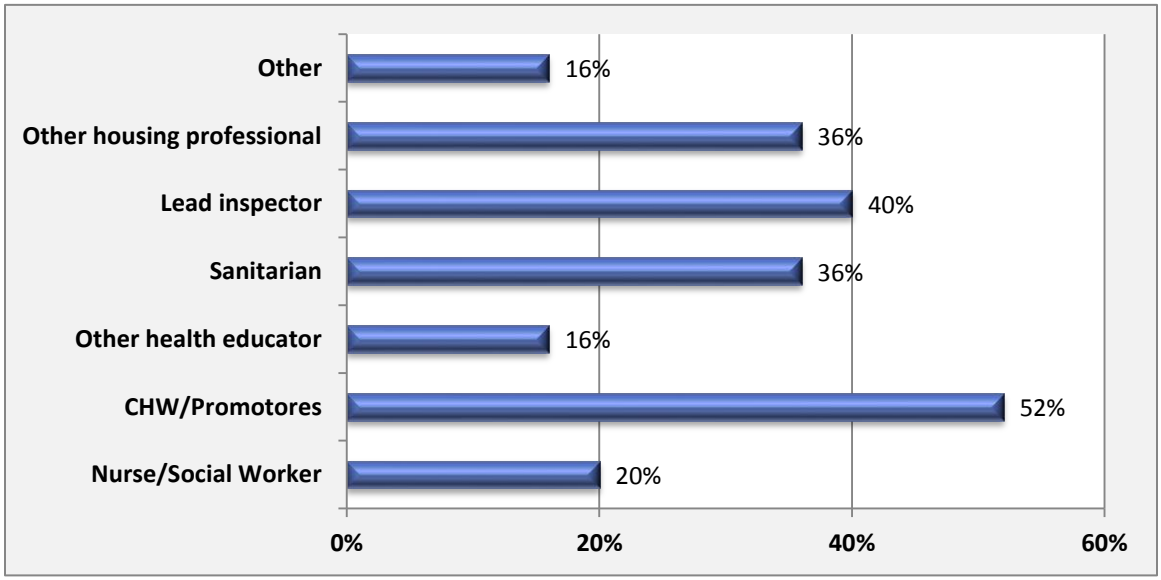


TABLE 5.1: FOCUS AREAS ROUTINELY ADDRESSED DURING VISUAL ASSESSMENT (N=25)

Focus areas	Visual assessment completed				
	N	Baseline (N)	Always at follow-up (N)	As needed at follow-up (N)	Not assessed (N)
Carbon monoxide hazards	25	92% (23)	44% (11)	36% (9)	8% (2)
Environmental tobacco smoke	25	92% (23)	56% (14)	16% (4)	8% (2)
Fire hazards	25	100% (25)	64% (16)	24% (6)	0% (0)
Housing code issues	25	72% (18)	40% (10)	32% (8)	28% (7)
Injury hazards	25	88% (22)	72% (18)	4% (1)	12% (3)
Inspection of appliances	25	72% (18)	28% (7)	28% (7)	28% (7)
Lead hazards	25	88% (22)	52% (13)	20% (5)	12% (3)
Moisture problems	25	100% (25)	64% (16)	24% (6)	0% (0)
Pest infestations and/or pesticide use	25	100% (25)	68% (17)	16% (4)	0% (0)
Poisoning hazards	25	96% (24)	56% (14)	28% (7)	4% (1)
Presence of mold	25	100% (25)	68% (17)	20% (5)	0% (0)
Structural hazards	25	92% (23)	60% (15)	20% (5)	8% (2)
Other	25	60% (15)	20% (5)	28% (7)	40% (10)

TABLE 5.2: GRANTEE ADDITIONAL COMMENTS ON HAZARDS ASSESSED DURING VISUAL ASSESSMENT

Response
Weatherization assessment in attics, under floors, walls.
Tested the hot water to assess if the temperature was over 120 degrees F to prevent burns.
Dust mite conditions, tap water temperature, refrigerator temperature, infant sleep environment
Radon tests taken at 1st visit- collected within 7 days and reassessed as needed. Our program conducts an extensive pre/post Environmental assessment, If hazards, safety issue, pests, some levels of mold/moisture, etc. the EHS may be brought in to re-assess, develop a scope of work, do the work, and reassess – at least 2 additional visual assessments.
All program participants received a Basic Level of services that include home assessment, health and safety education, cleaning methods training and supplies, access to the City's HEPA-vacuum loan program, and referral for medical case management and additional community services as appropriate.
Radon.
Slips, trips and falls for persons over age 65 years.

Presence of dust mite risks such as carpeting.
Other hazards specified in HUD Healthy Homes Inspection Manual.
Pet presence, fans in bathroom and kitchen, fragrances, doormats, active remodeling, water source, cleanliness, dryer venting, type of bedding, type of flooring, presence of uncleanable toys.
Utilized an extensive list of trigger hazards, including dust, heating system, weatherization related triggers, pets, etc. Level II was a five part assessment covering various issues ranging from family data, an injury prevention assessment, an asthma/allergy prevention assessment, to a room by room sanitary code inspection. A total of 231 of these assessments were conducted. Level III assessments were those conducted by a professional mold/moisture inspector. A total of 42 of professional assessments were conducted.
Working HEPA filtered vacuum; Asthma triggers (incense, air fresheners, cooking fumes, perfumes, solvents, etc.); walk off mat; appearance of cleanliness, clutter; furnace filter; window can be opened in each room; carpeting; bed size; sheets on beds; pet access to bedroom of asthmatic child if allergic; fridge temps, mercury hazards.
Asbestos.
All asthma or chronic respiratory condition triggers present in the homes were assessed pre- and post-construction.
Pets were included in baseline.
Environmental tobacco smoke; lead hazards; pest infestations and/or pesticide use. We only collected baseline assessments for these categories. The program provided education to change behavior for the participants. For lead, any participants were referred to our lead program.
Excessive dust, environmental allergen concentration in home vacuum, dust mite allergen in target child's bed, chemical and pesticide use, presence of gas leaks, mechanical assessment and adequacy of ventilation We offered two levels of assessment: 165 basic assessments for mild asthma children and 135 advanced assessment for persistent asthma children. For basic assessment: all of the above assessed at baseline only. For advanced assessment: all of the above assessed at baseline and follow-up.

5.2 SUMMARY OF CLIENT ASSESSMENTS/INTERVIEW DATA

All grantees conducted resident interviews. Client interviews were conducted mostly frequenty by: 1) CHWs/promotores (44%); 2) nurse/social worker (32%); and 3) other health educators (32%). Since health information may be sensitive, grantees also were asked what staff collected this specific type of data. Grantees reported health assessments were conducted mostly by CHWs/promotores (36%) and nurses/social workers (36%). (See Figures 5.2 and 5.3.) Other staff conducting interviews included home organization experts, personal physicians, university graduate students, and healthy homes technicians. (See Table 5.3.)

The mean time elapsed between enrollment and baseline interview was 2.2 weeks, with a minimum of one week and a maximum of five weeks. The second interview was conducted at mean of 3.6 months after the first interview, with a minimum of one month and a maximum of 18 months. For grantees who conducted a third and final interview, the mean was 7.5 months after the first interview, with a minimum of one month and a maximum of 18 months.

FIGURE 5.2: CLIENT INTERVIEWS CONDUCTED BY STAFF (N=25)

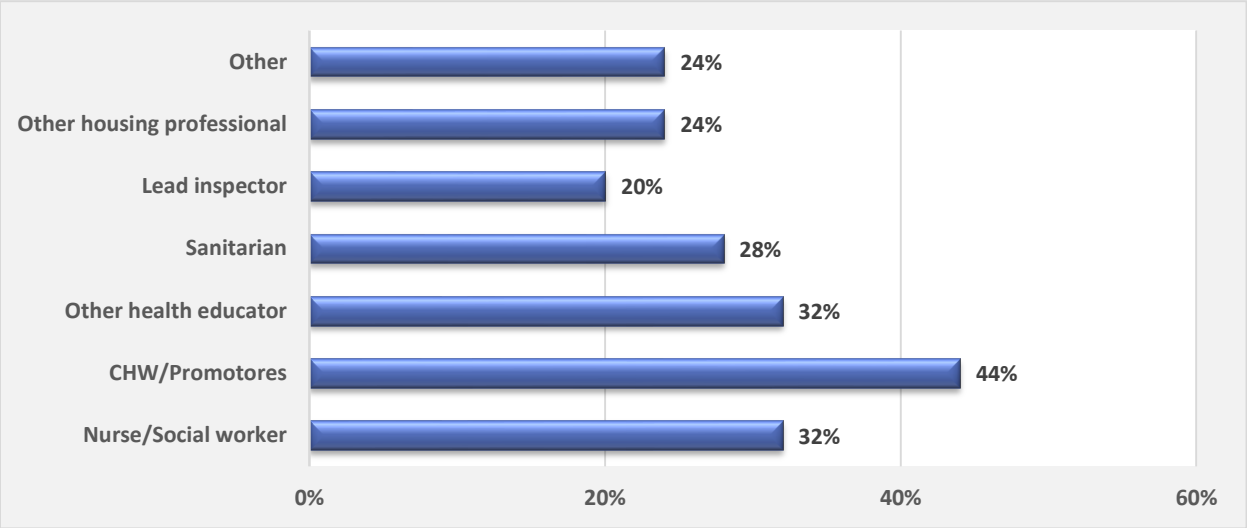


FIGURE 5.3: HEALTH ASSESSMENT/INTERVIEW CONDUCTED BY STAFF (N=25)

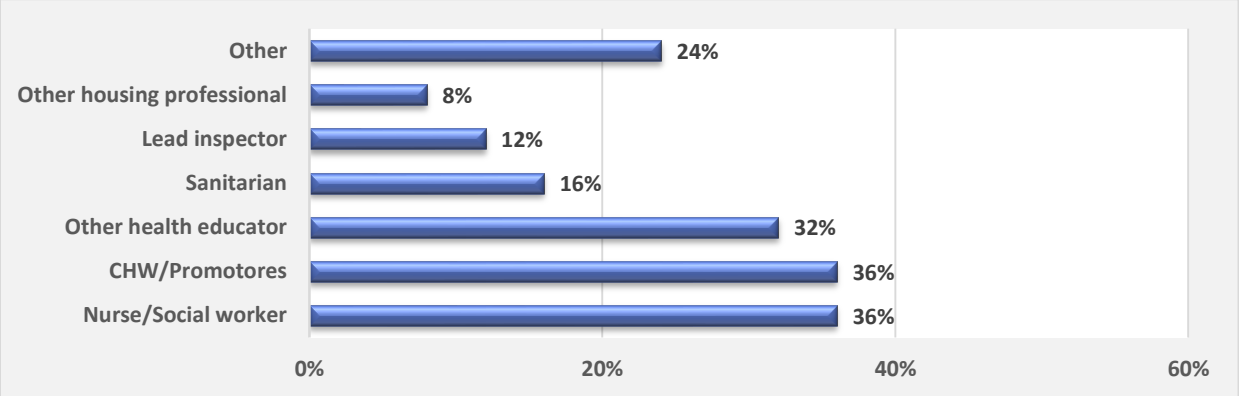


TABLE 5.3: ADDITIONAL GRANTEE COMMENTS ON STAFF WHO CONDUCTRED INTERVIEWS

Comments
Home maintenance and home organizer experts to educate and train about housekeeping practices to help them maintain better health and prevented them for being evicted.
Healthy Homes Outreach Worker, credentialed Healthy Homes Specialist.
"Other health education" = patient's participating physician. "Other housing professional" = Healthy House practitioners, licensed lead risk assessors, certified pest control technicians.
Our program EHS is also a lead inspector and a housing code inspector - same person.
"Other" refers to healthy homes technicians who conducted the environmental visual assessment and conducted an environmental questionnaire at baseline.
NCHH staff with varying credentials.
For "other," the program manager is a Healthy Home Specialist with 15+ years of Indoor Environmental Quality and Public Health experience, and is not a sanitarian.
Pre- and post-client interviews and health assessment interviews were also conducted by the Johns Hopkins University School of Nursing and the Johns Hopkins University School of Public Health graduate students. Post-remediation resident and property owner education was also provided by GHHI's Crew Chief or Assistant Crew Chief.
"Other housing professional" was represented by the HWAP technician working for our respective housing partners.
Michigan Public Health Institute (MPHI) conducted initial client interviews and health assessments. First Ward Community Center conducted follow-up interviews and housing education.
Education was provided by health educators, environmental hygienists, community partners, health providers involved in healthy homes. Home environmental assessments performed by a team: an environmental health coordinator and an environmental hygienist. Coordinator focused on health and home education; the hygienist on investigation.

Nineteen focus areas could have been addressed during the client interview. All 25 grantees completed baseline assessments for the following: 1) household/resident characteristics; 2) allergies; 3) asthma; 4) behavioral information; and 5) healthcare utilization. Follow-up client assessments fell into two categories: always at follow-up and as needed at follow-up. Focus areas with the most follow-ups are: 1) asthma (96%); 2) behavioral information (96%); and 3) healthcare utilization (92%). (See Table 5.4.) Additional questions asked by some grantees concerned residents' perceptions of neighborhood safety, medication management, and moisture control issues. (See Table 5.5.)

TABLE 5.4: FOCUS AREAS ROUTINELY ADDRESSED DURING CLIENT ASSESSMENTS/ INTERVIEWS (N=25)

Focus areas	Client assessments completed				
	N	Baseline (N)	Always at follow-up (N)	As needed at follow-up (N)	Not assessed (N)
Household/resident characteristics	25	100% (25)	52% (13)	24% (6)	0% (0)
History of household mobility	25	68% (17)	12% (3)	32% (8)	28% (7)
Housing characteristics	25	88% (22)	12% (3)	20% (5)	12% (3)
Socioeconomic characteristics	25	84% (21)	32% (8)	16% (4)	16% (4)
Client concerns about housing conditions	25	96% (24)	72% (18)	16% (4)	4% (1)
Client knowledge of focus areas	25	76% (19)	56% (14)	16% (4)	20% (5)
Allergies	25	100% (25)	60% (15)	28% (7)	0% (0)
Asthma	25	100% (25)	88% (22)	8% (2)	0% (0)
Elevated blood lead levels	25	68% (17)	28% (7)	32% (8)	32% (8)
Injuries	25	68% (17)	56% (14)	12% (3)	28% (7)
Other respiratory conditions	25	92% (23)	60% (15)	16% (4)	8% (2)
Poisonings	25	52% (13)	28% (7)	20% (5)	44% (11)
Behavioral information	25	100% (25)	80% (20)	16% (4)	0% (0)
Healthcare utilization	25	100% (25)	80% (20)	12% (3)	0% (0)
Health-related absences from school or work	25	88% (22)	76% (19)	16% (4)	8% (2)
Quality of life indicators	25	80% (20)	64% (16)	12% (3)	20% (5)
Self-report of symptoms	25	92% (23)	76% (19)	8% (2)	8% (2)
Need for additional social or other services	25	84% (21)	44% (11)	32% (8)	16% (4)
Other	25	36% (9)	20% (5)	4% (1)	64% (16)

TABLE 5.5: GRANTEE RESPONSES AS TO ADDITIONAL DATA COLLECTED DURING CLIENT INTERVIEWS

Responses
Medication management issues. Did the children need additional medical supplies provided by insurance? If so, our respiratory therapists obtained those items often during the baseline and initial follow-up visit, and provided those by billing insurance companies.
Is the home in a certain geographical location? We did our study in a school district so the household had to be within the boundaries of that school district and also not in a flood plain. I checked the baseline interview because we asked this question to determine qualification for the study. Once we know, there is no follow-up question regarding the geographical location of their home.
Pests, pesticide use, space heater, plumbing leak, roof leak, flooding.
At pre- and post-assessments, families were asked 5 questions to measure clients perceptions about if housing was making them sick, evaluating the health of their family, # of household members visits to ER, relationship with landlord, access to medical care. Children with asthma and seen by the nurse were interviewed about asthma, knowledge, symptoms, ER utilization and doctor visits during every nurse visit. Behavioral information, need for services, was gathered more informally and documented in notes at most visits.
Pests, comfort and safety, mental health, neighborhood safety, noise.
We obtained the age of housing through town's assessors. Most residents and homeowners did not know this information accurately.
EBLs are only conducted when referred to Lead Hazard Control.
Asthma control, child asthma short form for daytime, nighttime symptoms and functional limitations.
Neighborhood observations were completed following the initial interview for each household.
Symptom and exposure surveys. For basic assessment: symptom and exposure surveys at baseline only. For advanced assessment: attempted to gather symptom and exposure surveys at baseline and follow-up. Very difficult to get. Only 66 ended up providing this information.

5.3 SUMMARY OF BIOLOGICAL SAMPLING AND MEASUREMENT INFORMATION

Biological sampling played a very small part in grantees' activities. Only two grantees (8%) conducted biological sampling. Baseline sampling was conducted in four areas: 1) blood lead levels; 2) allergen testing – blood; 3) pulmonary function testing; and 4) saliva tests for exposure to hazards. (See Table 5.6.) One grantee conducted follow-up sampling for blood lead levels and pulmonary function testing.

TABLE 5.6: BIOLOGICAL SAMPLING (N=2)

Biological samples	Assessments		
	N	Baseline (N)	Follow-up (N)
Blood lead levels	2	100% (2)	50% (1)
Allergen testing – skin	2	0% (0)	0% (0)
Allergen testing – blood	2	50% (1)	0% (0)
Pulmonary function testing	2	50% (1)	50% (1)
Saliva tests for exposure to hazards	2	50% (1)	0% (0)

5.4 SUMMARY OF ENVIRONMENTAL SAMPLING AND MEASUREMENT INFORMATION

Most grantees reported having conducted environmental sampling (76%). Nineteen grantees reported collecting lead samples, with samples collected in a mean of five units per grantee, or over 100 units in total. (See Tables 5.7 and 5.8.) The most common types of non-lead samples were cockroach allergens (64%) and relative humidity (52%). Least common non-lead environmental samples included pesticide residue (0%), environmental tobacco smoke and particulate matter (4%, respectively, and dog and cat allergens (8%, respectively). (See Figure 5.4.) However, few grantees sampled all enrolled units for a particular allergen or condition. (See Table 5.10.) The most common sampling methods for dog, cat, and dust mites were vacuum dust samples. Cockroaches and mice were most commonly sampled via a pest monitoring station. Molds, Carbon Monoxide, other Indoor Air Quality, relative humidity, total VOCs (Volatile Organic Chemicals), and temperature were more likely to be sampled by other methods. Radon was most likely to be sampled by a short term-radon test. Particulate matter and environmental tobacco smoke were most likely to be sampled with a particle counter/data logger.

TABLE 5.9: UNITS TESTED FOR LEAD USING THE FOLLOWING METHODS (N=19)

Lead Testing Method	Units Tested				
	N	Less than 25% (N)	25% to 49% (N)	50% to 75% (N)	More than 75% (N)
XRF	4	50% (2)	25% (1)	25% (1)	0% (0)
Paint chip	3	100% (3)	0% (0)	0% (0)	0% (0)
Dust sample	10	40% (4)	10% (1)	10% (1)	40% (4)
Soil sample	4	75% (3)	0% (0)	0% (0)	25% (1)
Water sample	1	100% (1)	0% (0)	0% (0)	0% (0)
Other	1	0% (0)	0% (0)	0% (0)	100% (1)

TABLE 5.10: GRANTEE RESPONSES TO OTHER TYPES OF LEAD SAMPLES COLLECTED

Please specify what other types of lead samples were taken?
Lead was identified as a concern by the age of the home, EBLL and/or visual assessment with dust swab kits. If potential lead risk was identified, the EHS/Lead Risk assessor would do an additional visit and use the lead test swabs and or dust samples.
Dust wipes were not typically taken during the assessment - if potential lead hazards were identified, the family was referred to a separate Lead program for assessment.
All HHD units receiving lead hazard reduction intervention also received lead dust clearance sampling to confirm that the property met lead dust clearance standards. 100% of units receiving lead hazard reduction interventions received lead dust clearance inspections so it would be "more than 75%" for those units. In total out of units receiving intervention it would be "25-49%" as only a percentage of the total units needed lead hazard reduction interventions.
Lead dust samples were collected post-remediation at the time of clearance. All units passed HUD/EPA clearance standards.
Not part of this program. Existing lead program in the community. All kids were screened and any EBLs referred for services.

FIGURE 5.4: PERCENTAGE OF GRANTEES THAT COLLECTED SPECIFIC TYPES OF SAMPLES OR MEASUREMENTS (N=25)

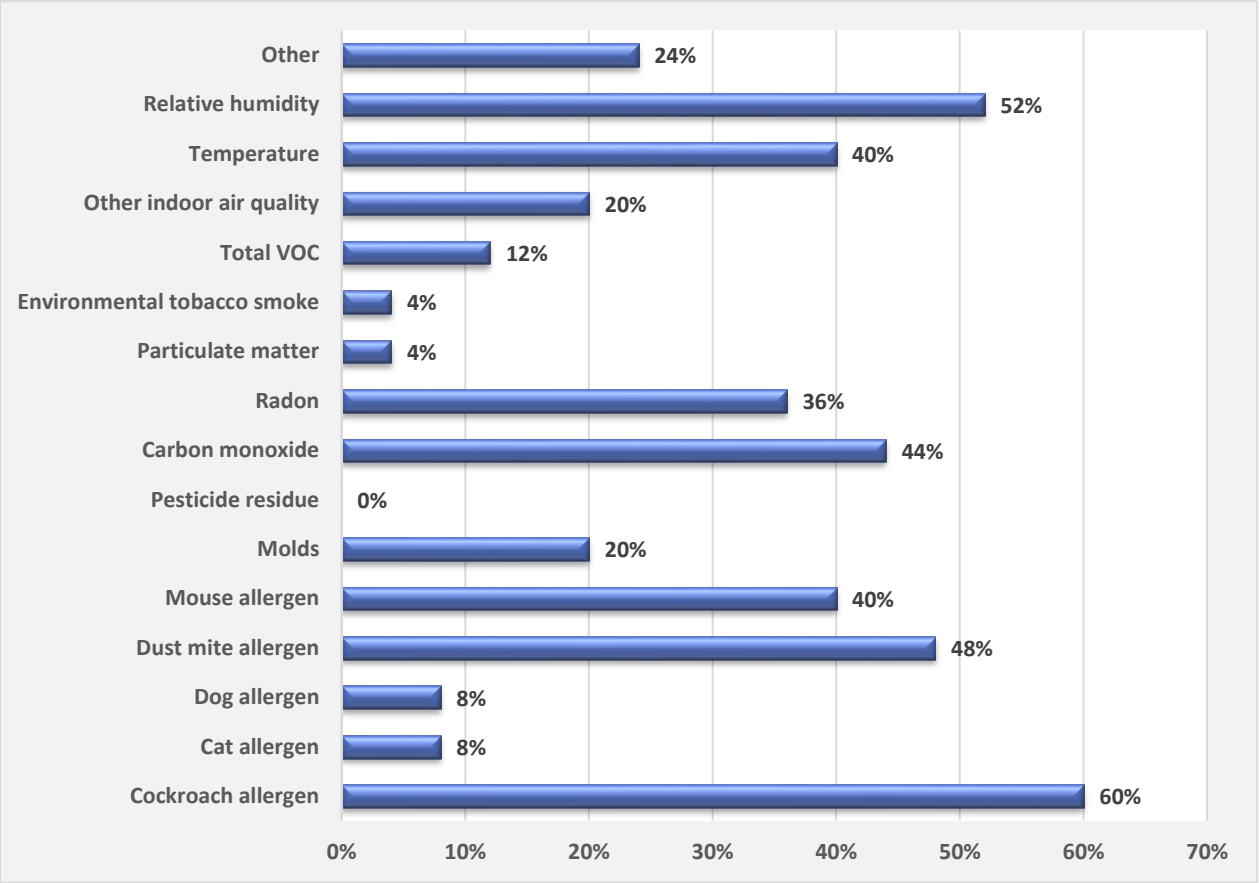


TABLE 5.11: FREQUENCY OF ENVIRONMENTAL SAMPLES TAKEN IN UNITS, BY CONDITIONS

Condition	N	Less than half	About half	More than half	All or nearly all
Cockroach allergen	15	47%	13%	7%	33%
Cat allergen	2	50%	0%	0%	50%
Dog allergen	2	50%	0%	0%	50%
Dust mite allergen	12	42%	0%	8%	50%
Mouse allergen	10	40%	10%	10%	40%

Condition	N	Less than half	About half	More than half	All or nearly all
Molds	5	40%	20%	0%	40%
Pesticide residue	0	0%	0%	0%	0%
Radon	9	44%	0%	22%	33%
Particulate matter	1	0%	0%	0%	100%
Environmental tobacco smoke	1	100%	0%	0%	0%
Total VOC	3	67%	0%	0%	33%
Other indoor air quality	5	20%	0%	0%	80%
Temperature	10	10%	0%	0%	90%
Relative humidity	13	23%	0%	0%	77%
Other	6	33%	17%	0%	50%

TABLE 5.12: GRANTEE RESPONSES TO OTHER TYPES OF NON-LEAD SAMPLES COLLECTED

Please specify what other types of non-lead samples were taken?
3 samples for cockroach, mice and dust mite were taken in kitchen, bedroom and living room for every enrolled unit at: baseline, one month, three months and 6 months.
We put out roach traps in the beginning to identify the severity of the roach problem and continued to monitor this as we treated the problem.
Carbon monoxide and carbon dioxide were collected in all units (other indoor air quality).
Vacuum dust samples for dust mite, cockroach/mouse allergen, and endotoxins were only collected on 4 cases before the testing program was terminated.
Supply/Return air velocities were collected and calculated air changes per hour for each room. Limited number had mold tape lifts. Limited number had furnace filter dust collection. Limited number had VOC sample/lab analysis collected. Supply/Return air velocities were collected and calculated air changes per hour for each room. All (or nearly all) of advanced assessments, limited number had mold tape lifts. Less than half of advanced assessments. Limited number had furnace filter dust collection. Less than half of advanced assessments. Limited number had VOC sample/lab analysis collected of advanced assessments.

TABLE 5.13: ADDITIONAL COMMENTS ON ENVIRONMENTAL SAMPLING COMPLETED AS PART OF THE PROJECT

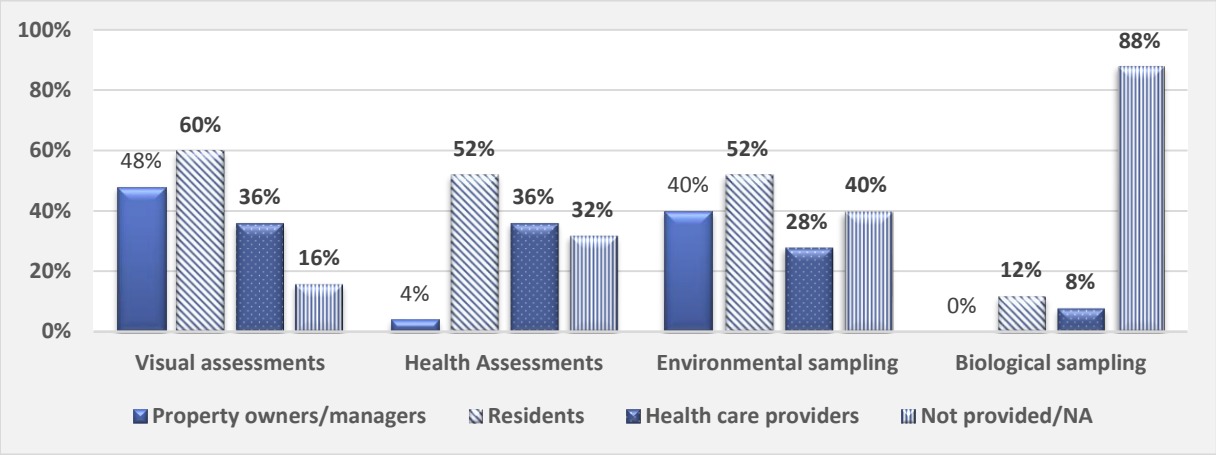
Is there anything else you would like to tell us about the environmental sampling completed as part of this project?
When testing for radon, we tried to have residents send the kits in after placement. This was not very successful and is a lesson learned. We also did not test upper units of apartment buildings for radon.

There was a 70.7% reduction in P1 dust mite allergen loading from pre-intervention to post-intervention. There was a 78. 5% reduction in F1 dust mite allergen loading from pre-intervention to post-intervention. There was 75% reduction in overall dust mite allergen loading in units were dust mites (P1 and F1) were found from pre-intervention (n=59) to post-intervention (n=15).
We used the dust sampling kit from National Jewish Health until they terminated this service. Anecdotally, we found poor correlation with their mold parameters and our visual assessments.
We conducted pre/post cockroach, dust mite and mouse urine samples in 50 of the 250 homes. Those 50 also received a 12-month post-intervention follow-up visit.
Cockroach and dust mites were the only allergens sampled due to cost of sampling.
The most specialized air sampling was done by a specialized hired contractor.
We followed HUD's Quality Assurance Plan and worked with a laboratory that meets HUD's Standards.
Environmental sampling for allergens was not found to be effective at shaping the interventions or the outcomes.

5.5 VEHICLES FOR COMMUNICATING ASSESSMENTS

Most grantees (88%) reported that a written summary of assessments was provided to property owners, residents or healthcare providers. A summary of visual assessment findings was provided to: 1) property owners (48%); 2) residents (60%); and 3) healthcare providers (36%). (See Figure 5.5.) A summary of health assessment findings was provided to: 1) property owners (4%); 2) residents (53%); and 3) healthcare providers (36%). A summary of environmental sampling results was provided to: 1) property owners (40%); 2) residents (52%); and 3) healthcare providers (28%). A summary of biological sampling results was provided only to residents (12%) and healthcare providers (8%).

FIGURE 5.5: PERCENT OF GRANTEES WHO COMMUNICATED ASSESSMENT RESULTS, BY AUDIENCE AND ASSESSMENT TYPE (N=25)



5.6: INTERVENTION INFORMATION

5.6.1 SUMMARY OF HOUSING UNITS TREATED

A mean of 193.8 housing units per grantee were enrolled, or a total of 3,101 units across all grantees. A mean of 38.6 owner-occupied units were enrolled. Table 5.14 provides the mean, minimum, and maximum number of units enrolled by grantees.

TABLE 5.14: ENROLLED HOUSING UNITS

Housing units		Count		
	N	Mean	Minimum	Maximum
Owner-occupied units	14	38.6	1	92
Rental units	14	113.9	12	266
Vacant Units	0	-	-	-
Units from a multi-family building	9	65.7	2	168
Single-family units	11	124.1	30	406
Units built before 1940	12	64.7	1	185
Units built between 1940-1978	13	74.7	18	237

Units built after 1978	11	35.4	6	118

5.6.2 SUMMARY OF HOUSING INTERVENTIONS AND INTENSITY

Grantees were asked to identify up to eight specific activities that were conducted routinely as part of their intervention process. As shown in Figure 5.6, all grantees reported both education and providing products and giveaways as interventions (100%), with installing devices or housing components the second most frequently used intervention (92% of grantees). The vast majority (84%) reported performing minor repairs or renovations and 64% reported performing major repairs. Once the work started for a single housing unit, it commonly took within one week (28%) to within one month (24%) to complete all interventions. (See Figure 5.7.)

FIGURE 5.6: INTERVENTION STRATEGIES (N=25)

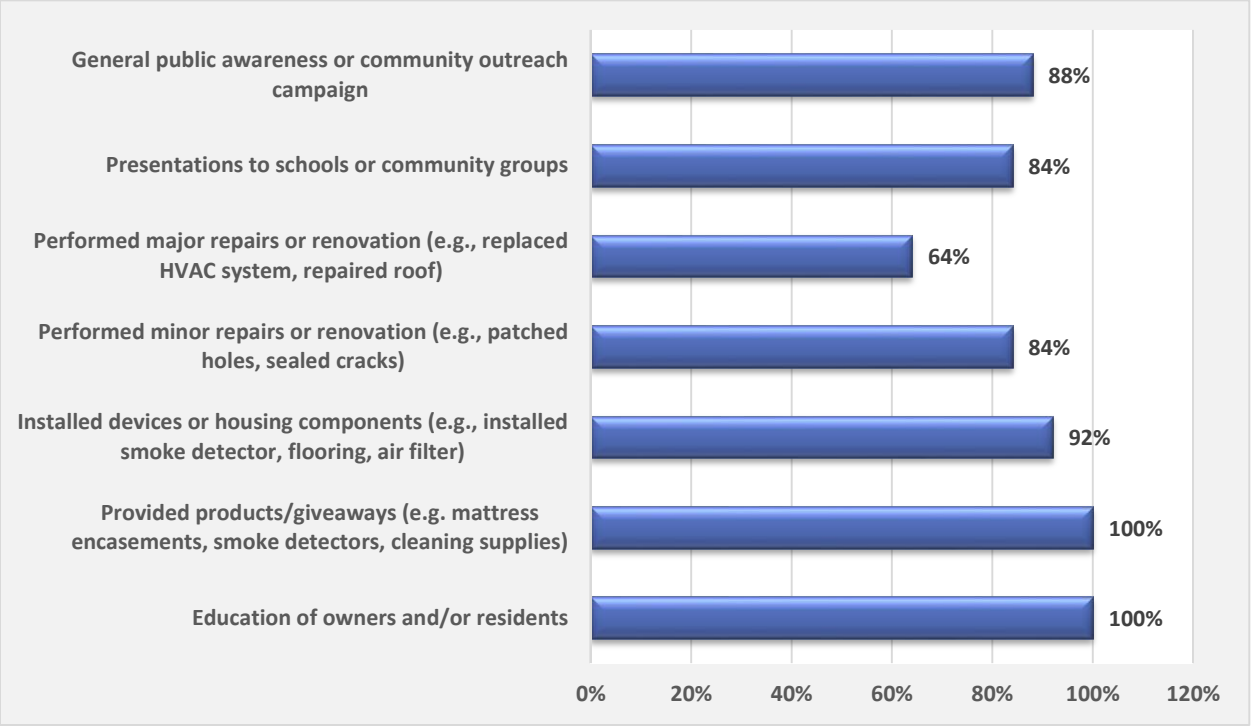
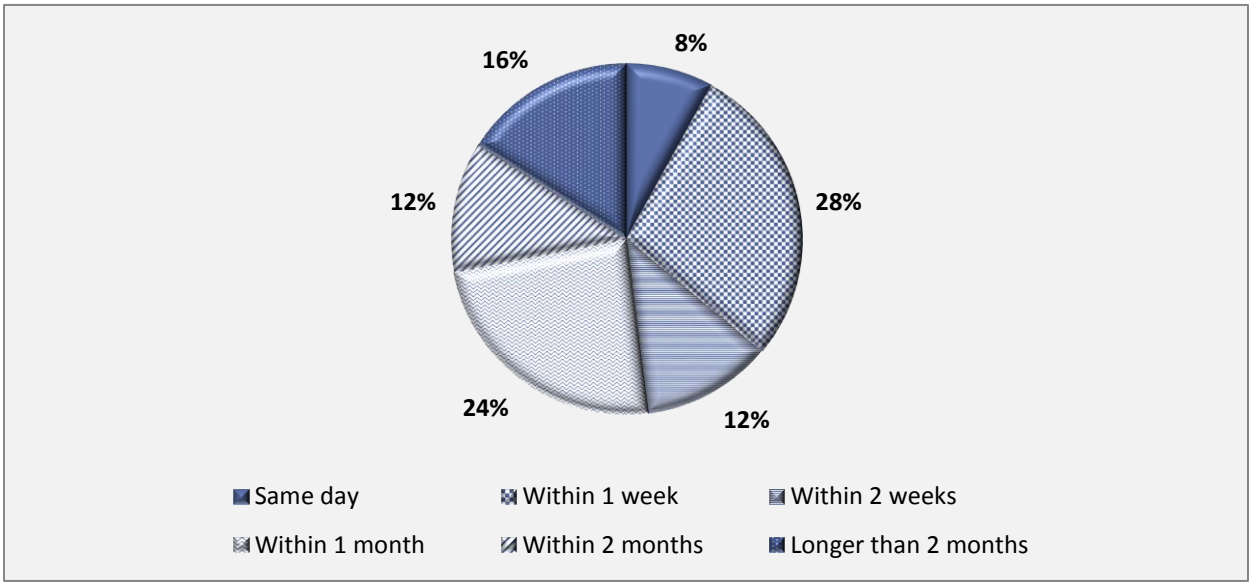


FIGURE 5.7: COMPLETION TIMEFRAME OF ALL INTERVENTIONS FOR SINGLE HOUSING UNIT



As shown in Table 5.15, grantees most frequently characterized their interventions as moderate in intensity. In particular, IPM, asthma trigger controls and education, and mold and moisture control most commonly were of moderate intensity

MINOR: **At a minimum, includes providing advice on recommended environmental changes to be performed by the members of the household, referrals to other programs such as smoking cessation, and providing low cost items such as cleaning supplies, mattress/pillow allergen impermeable covers, mouse traps or roach baits, cabinet or safety latches, carbon monoxide or other alarms, and radon test kits.**

MODERATE: **includes the provision of multiple low cost materials, and the active involvement of program staff. Activities in this category included the provision and fitting of mattress and pillow allergen impermeable covers, HEPA vacuums, small air filters and dehumidifiers, IPM, professional cleaning services, small area(s) of paint stabilization, replacement of kitchen or bathroom exhaust fans, covering bare soil, window replacement for the purpose of weatherization, minor repairs of structural integrity (e.g., patching holes), and installation of grab bars, safety latches, window guards, or alarms.**

MAJOR: **Involves structural improvements to the home, including carpet removal, replacement of ventilation systems, upgrades of heating and cooling systems, replacement of major appliances, soil removal, window replacement for the purposes of lead hazard control, large area(s) of paint stabilization or extensive repairs of structural integrity (roof, walls, and floors), and installation of active radon mitigation systems.**

TABLE 5.15: CHARACTERIZATION OF INTERVENTION INTENSITY

	N	Minor (N)	Moderate (N)	Major (N)
Asthma trigger reduction or other asthma education	25	8% (2)	56% (14)	36% (9)
Carbon monoxide hazards	24	36% (9)	48% (12)	12% (3)
Housing code issues	20	20% (5)	48% (12)	12% (3)
Injury prevention and safety	24	28% (7)	44% (11)	24% (6)
Lead hazard control	16	36% (9)	8% (2)	20% (5)
Mold and moisture control	25	20% (5)	56% (14)	24% (6)
Pest control or integrated pest management	25	12% (3)	76% (19)	12% (3)
Radon	13	36% (9)	8% (2)	8% (2)
Structural hazards (e.g., foundations, walls, roof)	21	24% (6)	40% (10)	20% (5)
Weatherization/energy efficiency	17	28% (7)	20% (5)	20% (5)
Other indoor air quality	21	32% (8)	40% (10)	12% (3)
Other	5	4% (1)	8% (2)	8% (2)

5.6.3 REFERRALS AS PART OF INTERVENTIONS

The majority of grantees (64%) completed IPM interventions within the program, with 28% occasionally and 8% routinely making referrals to other programs as part of their intervention process. Occasional referrals were made commonly to a health care provider or organization (60%), lead program (52%), asthma program or coalition (48%), and social services (48%). Routine referrals were made most commonly to social services (40%) and weatherization programs (40%).

Grantees reported routinely receiving referrals from health care providers or organizations (60%). Occasionally, grantees received referrals from an asthma program or coalition (44%) and lead program (44%). They almost never received referrals from IPM programs (96%).

5.6.4 EDUCATIONAL INTERVENTIONS

When asked about up to four methods for education, grantees reported covering a mean of 2.2 methods, and ranges of one to four. The majority of grantees provided education in both written and verbal formats to residents on 12 topics. (See Table 5.16.) The majority of grantees supplied both types

of information to property owners or property managers for all topics except medical management. (See Table 5.17.) Few grantees reported using either verbal or written formats alone.

TABLE 5.16: TYPE OF EDUCATIONAL INTERVENTIONS PROVIDED TO RESIDENTS

Educational Interventions	Type provided to residents			
	N	Written material only (N)	Verbal education only (N)	Both written and verbal education (N)
Lead poisoning prevention	23	4% (1)	4% (1)	91% (21)
Asthma triggers	25	0% (0)	4% (1)	96% (24)
Injury prevention	24	0% (0)	25% (6)	75% (18)
Poisoning prevention	24	8% (2)	8% (2)	80% (20)
Integrated pest management	25	0% (0)	20% (5)	80% (20)
Mold and moisture prevention	25	4% (1)	20% (5)	76% (19)
Carbon monoxide poisoning prevention	23	0% (0)	26% (6)	74% (17)
Energy efficiency	16	6% (1)	31% (5)	63% (10)
Fire safety	22	0% (0)	18% (4)	82% (18)
Radon	16	19% (3)	6% (1)	75% (12)
Environmental tobacco smoke/smoking cessation	24	0% (0)	8% (2)	92% (22)
Medical management (of asthma or another condition)	22	0% (0)	5% (1)	95% (21)
Other	4	0% (0)	0% (0)	100% (4)

TABLE 5.17: TYPE OF EDUCATIONAL INTERVENTIONS PROVIDED TO PROPERTY OWNERS

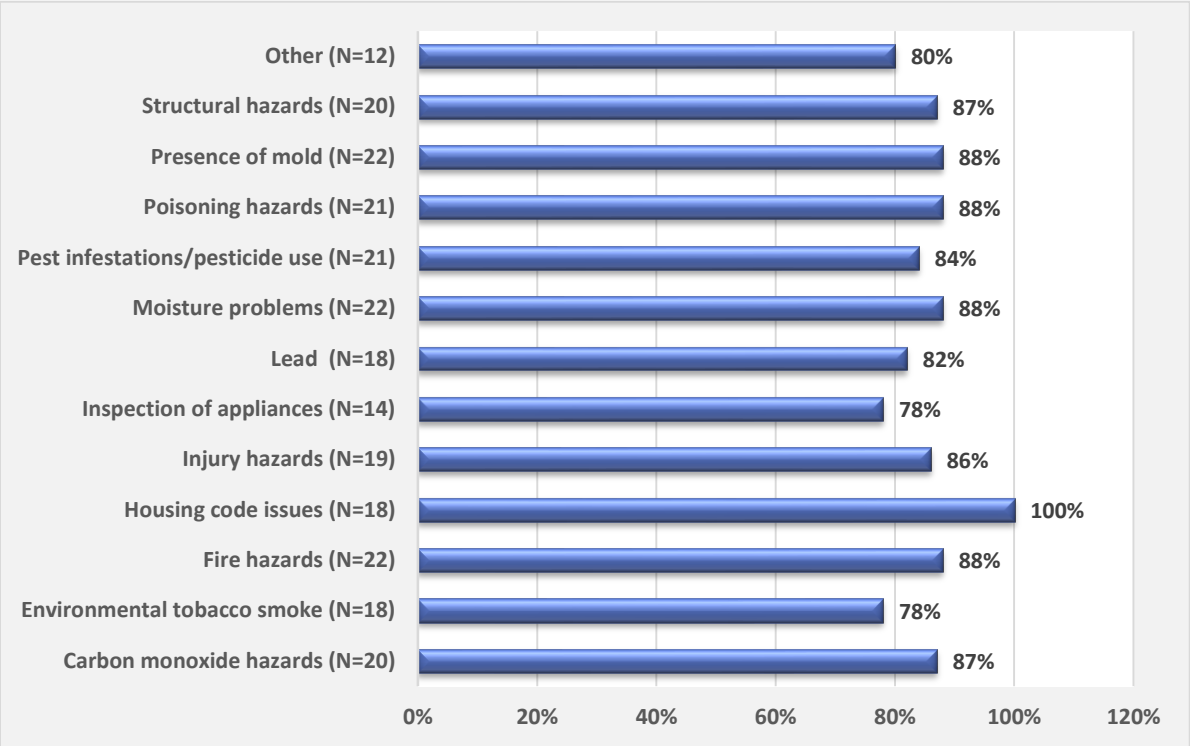
Educational Interventions	Type provided to property owners			
	N	Written material only (N)	Verbal education only (N)	Both written and verbal education (N)
Lead poisoning prevention	19	26% (5)	5% (1)	68% (13)
Asthma triggers	18	11% (2)	11% (2)	78% (14)
Injury prevention	17	12% (2)	29% (5)	59% (10)
Poisoning prevention	15	7% (1)	7% (1)	87% (13)
Integrated pest management	20	10% (2)	20% (4)	70% (14)
Mold and moisture prevention	19	11% (2)	11% (2)	79% (15)
Carbon monoxide poisoning prevention	17	18% (3)	29% (5)	53% (9)
Energy efficiency	13	8% (1)	31% (4)	62% (8)
Fire safety	17	18% (3)	18% (3)	65% (11)
Radon	13	23% (3)	8% (1)	69% (9)
Environmental tobacco smoke/smoking cessation	14	7% (1)	14% (2)	79% (11)
Medical management (of asthma or another condition)	9	0% (0)	0% (0)	100% (9)
Other	1	0% (0)	0% (0)	100% (1)

CHAPTER 6: OUTCOMES

6.1 SUMMARY OF GRANTEE EVALUATION OUTCOMES

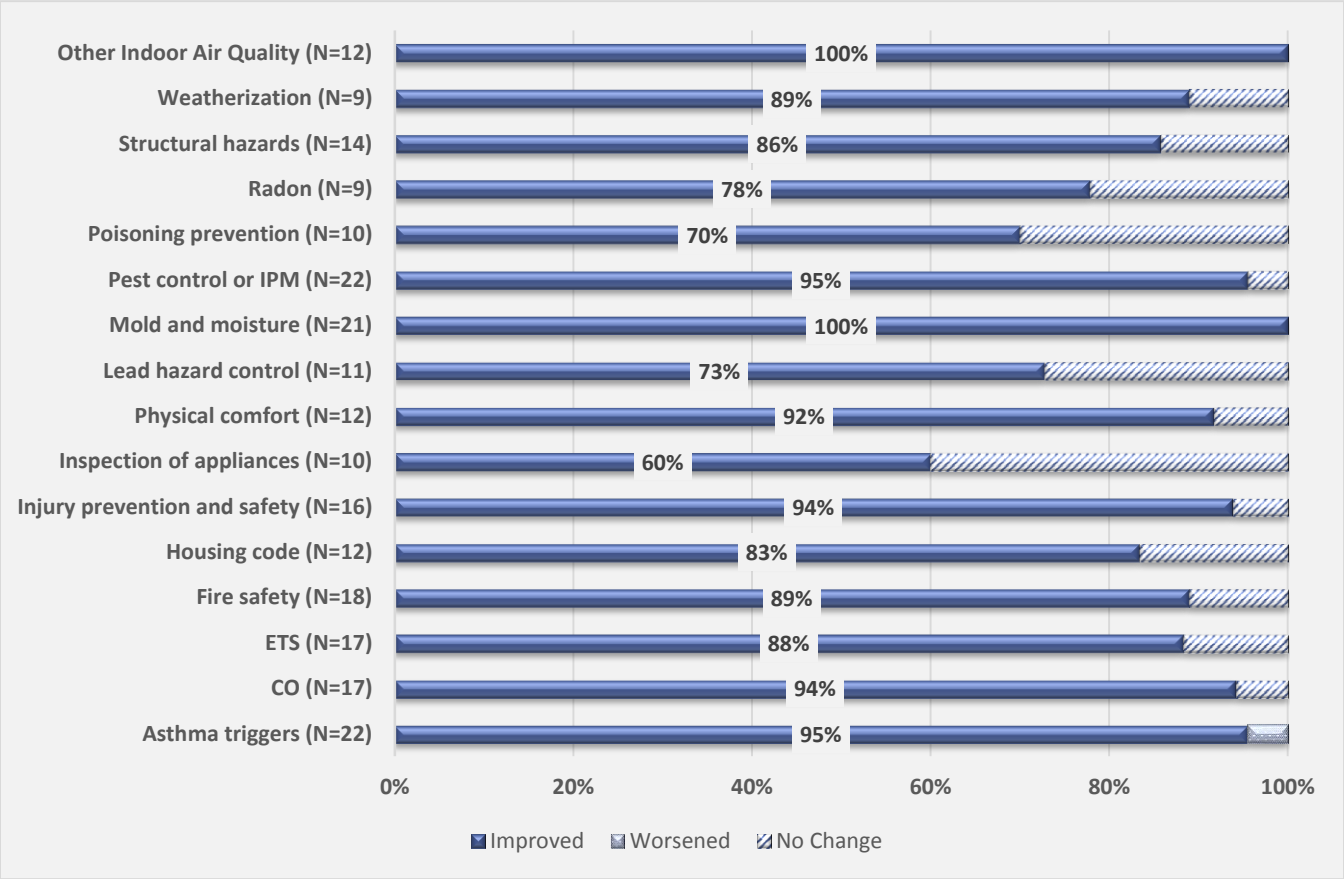
The housing conditions for which grantees most frequently collected pre- and post-intervention data were mold, moisture, and fire safety (88%, N=22, respectively) and poisoning hazards (88%, N=21). When housing code violations were assessed, they were always assessed at follow-up, but fewer grantees tracked this condition (N=19). (See Figure 6.1.)

FIGURE 6.1: PERCENTAGE OF GRANTEES WHO ASSESSED HOUSING CONDITION AT FOLLOW UP, IF THEY ASSESSED IT AT BASELINE



All the housing conditions for which grantees assessed change pre- and post-intervention showed high levels of improvement. (See Figure 6.2.) The housing conditions that showed the most improvement between baseline and follow-up were: 1) mold and moisture (100%, N=21), and other Indoor Air Quality issues (100%, N=12); 2) asthma trigger control and pest control/IPM (95%, N=21); 3) carbon monoxide (94%, N=16) and injury and safety (94%, N=16); and 4) physical comfort (92%, N=12).

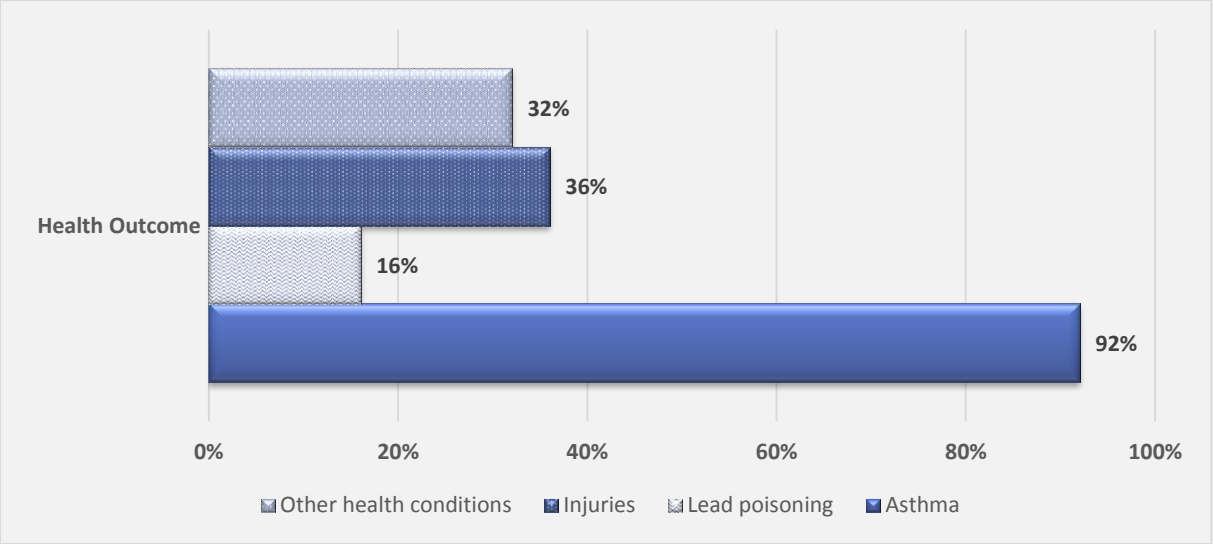
FIGURE 6.2: PERCENTAGE CHANGES REPORTED IN HOUSING CONDITIONS, PRE-POST INTERVENTION



Although fewer grantees applied tests of statistical significance to these housing condition changes, those who did tended to find the improvements statistically significant. This is discussed in more detail in Sections 6.2- 6.6.

The majority tracked changes in asthma outcomes pre-post intervention (92%) but far fewer grantees reported assessing changes in other health outcomes. (See Figure 6.3.)

FIGURE 6.3: PERCENTAGE OF GRANTEES THAT ASSESSED HEALTH CONDITION, PRE- AND POST-INTERVENTION (N=25)



Note that more respondents indicated they included questions about self-reported health conditions in their resident questionnaires at baseline and at follow-up than reported that they assessed changes in specific health outcomes. (See Table 6.1.)

6.2 EDUCATION-RELATED OUTCOMES

There was no formal assessment of educational outcomes, but 36% of grantees reported that they did administer a post-test to assess knowledge or skills. (See Table 6.1.) Their comments suggest they did observe positive benefits from the educational interventions. (See Table 6.2.)

TABLE 6.1: EDUCATIONAL INTERVENTIONS - DEMONSTRATIONS AND KNOWLEDGE ASSESSMENTS (N=25)

Educational interventions included:	Yes (N)	No (N)
Hands-on demonstration (e.g., cleaning demonstration)	80% (20)	20% (5)
Participants asked to repeat a hands-on demonstration	44% (11)	56% (14)
Participants completed a pre-test to assess knowledge or skills	32% (8)	68% (17)
Participants completed a post-test to assess knowledge or skills	36% (9)	64% (16)
None of the above	12% (3)	88% (22)

TABLE 6.2: EDUCATIONAL INTERVENTION OPEN ANSWERS

Responses
Pre-post exams revealed greater awareness of asthma triggers by the end of the study. All participants were required to participate in hands-on demonstrations. Those that incorporated that learning experience into their lifestyles were more successful than those that were resistant.
Overall, all participants were able to apply the education and techniques learned, and were able to improve their housekeeping and home maintenance overtime.
The subject caregivers worked with CHWs to clean their homes and rid the homes of cockroaches.
50% of the clients demonstrated a reduction in severity of asthma symptoms.
Education also occurred throughout the assessment/intervention processes.
Findings revealed that there was a significant increase in knowledge, attitude and behaviors for both Standard and Intensive Intervention groups. Participants liked the demonstrations and were able to keep up their activities at home at follow-up activities.
We did a baseline and six month follow-up verbally administered questionnaire, which assessed knowledge and behavior change.
Models of asthma medication devices/components of respiratory tract (lungs/airway) were available for demonstrations at the Group Education Sessions. Spacers to be used with aerosol delivery were also a give-away at the Group Education Sessions. Instructions were given by a Public Health Nurse who was a certified asthma educator.
The main findings of the knowledge and skills evaluation were that homeowners were not aware that the household cleaning goods that they frequently used in their homes were hazardous to their health. Other findings suggested that they were also not aware that there were many no-cost and low-cost solutions.

6.3 ASTHMA-RELATED OUTCOMES

The majority of grantees assessed changes in housing conditions related to mold and moisture (88%, N=22), pests/pesticides (84%, N=21), and Environmental Tobacco Smoke (ETS) (78%, N=18). The vast majority of those who assessed these conditions pre- and post-intervention reported improvement from baseline in the following: 100% for mold and moisture, and other IAQ conditions; 95% for asthma triggers and pest control/IPM; and 88% for ETS (see Table 6.3). The only condition where grantees reported a worsening of conditions was asthma triggers (N=1). Far fewer of these grantees could report that they had tested to determine if these improvements were statistically significant: asthma triggers (N=15); ETS (N=9); mold and moisture (N=21); Indoor Air Quality issues (N=6); and pest control/IPM (N=9). Asthma triggers, mold and moisture, ETS, other Indoor Air Quality issues, and pest control/IPM all

had more reported cases of statistically significant improvements than those that were not statistically significant. However, the small numbers of cases for the latter three may limit the generalizability of this finding for these conditions.

TABLE 6.3: CHANGES REPORTED IN HOUSING CONDITIONS RELATED TO ASTHMA, ALLERGIES AND RESPIRATORY OUTCOMES, AND THE STATISTICAL SIGNIFICANCE OF THOSE CHANGES

	N	Improved (N)	Worsened (N)	No Change (N)
CHANGES IN HOUSING CONDITIONS ASSOCIATED WITH ASTHMA TRIGGERS				
Change from baseline	22	95% (21)	5% (1)	0% (0)
Change from baseline-No Statistical Test Applied	7	100% (7)	0% (0)	0% (0)
Change from baseline-Not Statistically Significant	3	67% (2)	33% (1)	0% (0)
Change from baseline-Statistically Significant	12	100% (12)	0% (0)	0% (0)
CHANGES IN HOUSING CONDITIONS ASSOCIATED WITH ENVIRONMENTAL TOBACCO SMOKE				
Change from baseline	17	88% (15)	0% (0)	12% (2)
Change from baseline-No Statistical Test Applied	7	86% (6)	0% (0)	14% (1)
Change from baseline-Not Statistically Significant	4	100% (4)	0% (0)	0% (0)
Change from baseline-Statistically Significant	5	100% (5)	0% (0)	0% (0)
Change from baseline-Unknown if Test Applied	1	0% (0)	0% (0)	100% (1)
CHANGES IN HOUSING CONDITIONS ASSOCIATED WITH MOLD AND MOISTURE				
Change from baseline	21	100% (21)	0% (0)	0% (0)
Change from baseline-No Statistical Test Applied	No Data			
Change from baseline-Not Statistically Significant	No Data			
Change from baseline-Statistically Significant	21	100% (21)	0% (0)	0% (0)
CHANGES IN HOUSING CONDITIONS ASSOCIATED WITH OTHER INDOOR AIR QUALITY MEASURES				
Change from baseline	12	100% (12)	0% (0)	0% (0)
Change from baseline-No Statistical Test Applied	6	100% (6)	0% (0)	0% (0)
Change from baseline-Not Statistically Significant	2	100% (2)	0% (0)	0% (0)
Change from baseline-Statistically Significant	4	100% (4)	0% (0)	0% (0)
CHANGES IN HOUSING CONDITIONS ASSOCIATED WITH PEST CONTROL/IPM				
Change from baseline	22	95% (21)	0% (0)	5% (1)
Change from baseline-No Statistical Test Applied	13	100% (13)	0% (0)	0% (0)

	N	Improved (N)	Worsened (N)	No Change (N)
Change from baseline-Not Statistically Significant	4	75% (3)	0% (0)	25% (1)
Change from baseline-Statistically Significant	5	100% (5)	0% (0)	0% (0)

Grantees reported on eight specific asthma-related outcome measures, as well as any other ways they assessed asthma outcomes. The mean number of measures reported was 6.5, and a range of two to eight. The most frequently-assessed outcome was Emergency Department(ED)/urgent care visits, followed by hospitalizations and limits on physical activity. (See Table 6.4.)

SURVEY MEASURES OF ASTHMA OUTCOMES

- Hospitalizations;
- ED/urgent care visits;
- Days with worsening symptoms;
- Symptom-free days;
- Nighttime symptoms;
- Days missed from school, work, or child care;
- Use of rescue inhaler; and
- Limitations on usual activity.

Grantees reported improvements of 80% to 94% on the measures they assessed, with the greatest improvements in hospitalizations (94%) as well as nighttime systems and days missed from school, work or child care (93%, respectively). Some grantees reported no change for ED/urgent care visits, days with worsening symptoms, use of rescue inhalers, and limitations on physical activities, but this did not exceed 20%.

TABLE 6.4: CHANGES REPORTED IN ASTHMA OUTCOMES

	N	Improved (N)	Worsened (N)	No Change (N)
Hospitalizations	17	94% (16)	0% (0)	6% (1)
ED/urgent care visits	20	80% (16)	0% (0)	20% (4)
Days with worsening symptoms	15	87% (13)	0% (0)	13% (2)
Symptom-free days	10	90% (9)	10% (1)	0% (0)
Nighttime symptoms	15	93% (14)	0% (0)	7% (1)
Days missed from school, work, or child care	14	93% (13)	0% (0)	7% (1)
Use of rescue inhaler	13	85% (11)	0% (0)	15% (2)

	N	Improved (N)	Worsened (N)	No Change (N)
Limitations on usual physical activity	16	88% (14)	0% (0)	13% (2)

It is important to note that grantees used multiple time periods for determining whether a change occurred, ranging from prior to the start of the intervention (time period unspecified) to the prior 14 days, the prior month, the prior three months, and the prior year. A comparison of the patterns of improvement, no change, and worsened outcomes, controlling for the same time periods (e.g., the previous 14 days for both baseline and follow up), showed no marked differences from the trends shown in Table 6.4..

ADDITIONAL ASTHMA OUTCOME MEASURES MENTIONED BY GRANTEES

- **Child physical activity;**
- **Child physical health;**
- **Child and family emotional health;**
- **Caregiver quality of life;**
- **Application of asthma trigger control practices by caregiver;**
- **Unanticipated health care provider visits;**
- **Forced Expiratory Volume;**
- **Degree of asthma severity/control;**
- **Parental reports of how hard their child 'had to work to breathe'; and**
- **Presence/absence of an Asthma Action Plan.**

The sample sizes, statistical significance, and measures reported in grantees' narratives on asthma outcomes are displayed in Table 6.A, Appendix 2. In the survey, four of the grantees provided the statistical significance of changes, and another three noted "significant" improvement without supplying the supporting data. The only measures where a grantee reported no statistically significant change from baseline were 1) reduction in school days missed; and 2) overnight hospitalizations. Grantees described a number of assessment tools, but mentioned only three with validated measures: 1) Asthma Control Test (ACT); 2) Pediatric Asthma Caregiver's Quality of Life Questionnaire; and 3) American Academy of Pediatrics' Children's Health Survey for Asthma (CHSA).

In order to provide a fuller perspective on grantees' measures, time periods used in assessment, and the magnitude of the changes identified, Appendix 3 summarizes for each of the eight asthma outcomes the detailed grantee survey responses and the information provided in their final reports. As seen in the survey responses, most grantees showed reported improved outcomes post-intervention. Although few

grantees applied tests of statistical significance to improvements in any health outcome, those who did tended to find the improvements statistically significant at the $p < 0.05$ or smaller.

6.4 LEAD POISONING-RELATED OUTCOMES

Fewer grantees assessed the changes in housing conditions associated with lead poisoning prevention (N=11). This is not surprising, given the stated purpose of the HHD and Healthy Homes Production grants was to focus on other issues. The majority reported improvements in housing outcomes (73%, N=8) or no change (27%, N=3). Only four grantees reported the statistical significance of the changes, with half showing statistically significant improvements and half not statistically significant.

TABLE 6.5: CHANGES REPORTED IN HOUSING CONDITIONS RELATED TO LEAD HAZARD CONTROL, AND THE STATISTICAL SIGNIFICANCE OF THOSE CHANGES

	N	Improved (N)	Worsened (N)	No Change (N)
Change from baseline	11	73% (8)	0% (0)	27% (3)
Change from baseline-No Test Applied	6	67% (4)	0% (0)	33% (2)
Change from baseline-Not Statistically Significant	2	100% (2)	0% (0)	0% (0)
Change from baseline-Statistically Significant	2	100% (2)	0% (0)	0% (0)
Change from baseline-Unknown if Test Applied	1	0% (0)	0% (0)	100% (1)

Few grantees reported data on health services related to lead poisoning (N=3). However, their cumulative impact is striking, with 422 children in total needing blood lead screening, resulting in the identification of 81 with elevated blood lead levels between 5-9 µg/dl or above, 27 with elevated blood lead levels of 10 µg/dl or above, nine identified in need of case management services, 32 who needed temporary relocation, and two who needed permanent relocation. (See Table 6.6.) None of the grantees reported statistically significant tests for blood lead outcomes post-intervention. (See Table 6.7.)

TABLE 6.6: NUMBER OF CHILDREN WHOSE LEAD POISONING OUTCOMES WERE REPORTED BY GRANTEES

Number of Children	N	Mean	Minimum	Maximum	Total number of children
In need of screening	3	140.7	8	339	422.0
With elevated blood lead levels (5-9 µg/dl or above)	2	40.5	1	80	81.0
With elevated blood lead levels (10 µg/dl or above)	2	13.5	9	18	27.0
In need of case management services	1	9.0	9	9	9.0
Who needed to be temporarily relocated	1	32.0	32	32	32.0
Who needed to be permanently moved	1	2.0	2	2	2.0

TABLE 6.7: GRANTEE NARRATIVES ON LEAD POISONING OUTCOMES

Responses
EBLs were tracked as a separate program service, but integrated as needed, so outcome data is not available. We did track EBLs in general and know that they went up compared to baseline, but this is because we drew blood from them after baseline data was collected. We ensured that children had been tested (i.e., our nurse educator is also the medical case manager for EBLs). For those that were high, we opened a lead poisoning case that provided lead risk assessment and medical case management as well as orders for correction and referral to the city lead hazard control grant program (in a different agency). The same staff on the HUD HHD grant intervention also did the lead assessments and medical case management.
The 75 participants not previously screened for lead were offered lead screening. Eighteen (24%) accepted screening. Of the children screened, none were found to have elevated blood lead levels.
Client families who had children identified with elevated blood lead levels or who were residing in properties with outstanding Health Department Lead Violations were fast tracked through the program for prompt assessment and housing intervention or referred to the City's Lead Hazard Reduction Demonstration Grant Program where the scope of the intervention exceeded the program's budget. Temporary relocation using property owner or CDBG funds were utilized where warranted to temporarily relocate children out of lead hazardous housing.

6.5 INJURY PREVENTION–RELATED OUTCOMES

The majority of those who assessed injury-related conditions in the home reported improvement from baseline (94% for injury, 89% for fire safety, and 70% for poisonings). (See Table 6.8.) None reported that conditions had worsened. Far fewer of these grantees could report whether these improvements were statistically significant (injury, N=9; poisoning and fire safety, N=6). Improvements related to injury conditions were the only cases where more statistically significant changes were reported than non-

statistically significant changes. (Conditions related to radon, carbon monoxide, condition of appliances, and structural safety, which can have implications for both injuries and respiratory conditions or lead poisoning, are addressed in the next section.)

TABLE 6.8: CHANGES REPORTED IN HOUSING CONDITIONS RELATED TO INJURIES AND POISONINGS, AND THE STATISTICAL SIGNIFICANCE OF THOSE CHANGES

	N	Improved (N)	Worsened (N)	No Change (N)
CHANGES HOUSING CONDITIONS ASSOCIATED WITH INJURY				
Change from baseline	16	94% (15)	0% (0)	6% (1)
Change from baseline-No Statistical Test Applied	6	100% (6)	0% (0)	0% (0)
Change from baseline-Not Statistically Significant	3	67% (2)	0% (0)	33% (1)
Change from baseline-Statistically Significant	6	100% (6)	0% (0)	0% (0)
Change from baseline-Unknown if Test Applied	1	100% (1)	0% (0)	0% (0)
CHANGES IN HOUSING CONDITIONS ASSOCIATED WITH POISONINGS				
Change from baseline	10	70% (7)	0% (0)	30% (3)
Change from baseline-No Statistical Test Applied	2	100% (2)	0% (0)	0% (0)
Change from baseline-Not Statistically Significant	4	75% (3)	0% (0)	25% (1)
Change from baseline-Statistically Significant	2	100% (2)	0% (0)	0% (0)
Change from baseline-Unknown if Test Applied	2	0% (0)	0% (0)	100% (2)
CHANGES IN HOUSING CONDITIONS ASSOCIATED WITH FIRE SAFETY				
Change from baseline	18	89% (16)	0% (0)	11% (2)
Change from baseline-No Statistical Test Applied	10	90% (9)	0% (0)	10% (1)
Change from baseline-Not Statistically Significant	3	100% (3)	0% (0)	0% (0)
Change from baseline-Statistically Significant	3	100% (3)	0% (0)	0% (0)
Change from baseline-Unknown if Test Applied	2	50% (1)	0% (0)	50% (1)

Only nine grantees provided detail on the specific health outcome measures used. All the respondents based their assessment on resident self-reports. Only one grantee reported using a validated measure (i.e., the Medicaid Health Outcomes Survey). The time periods for determining change from pre-

intervention to post-intervention ranged from six months to 12 months, but many grantees did not specify the time period.

In general, the grantees reported improvements in health outcomes, but most of these were not statistically significant. (See Table 6.B in Appendix A for detailed grantee comments.) Of those who did not find statistically significant changes, only one involved a control group: the Case Healthy Homes and Patients Program (CHHAP2, OHLHH0164-08) compared a group of senior patients who received inspection services to a control group that did not. The grantee notes: "The medical outcomes for both the CHHAP participants and the comparison group are noted in Table 2 [from the grant final report]. While there was a modest decrease in the hospitalization rate for the CHHAP patients, there was also a slight increase in ER visits. Injuries and injuries-in-the home were comparable in the two groups. None of these findings reached statistical significance."

ADDITIONAL INJURY OUTCOME MEASURES REPORTED BY GRANTEES:

- **Reductions in the number of falls, injury-related Emergency Department visits, and hospitalizations;**
- **Reductions in unintentional injuries that required a visit to a health care provider;**
- **Calls to Poison Control Centers; and**
- **Resident self-reports of changes in behavior or feelings of safety.**

Table 2. Incidence Rates and Incidence Rate Ratios.

	Inspection (N=43)		No Inspection (N=185)			
	Events	Incidence rate per 100	Events	Incidence rate per 100	Unadjusted incidence rate ratio	Age-adjusted incidence rate ratio
Hospitalizations	22	5.7	238	6.3	0.90 (0.55, 1.39)	0.84 (0.54, 1.31)
ER visits	17	4.4	131	3.5	1.26 (0.71, 2.10)	1.15 (0.69, 1.91)
Injuries*	5	1.3	54	1.4	0.90 (0.28, 2.24)	0.87 (0.34, 2.18)
Injuries in home*	5	1.3	52	1.4	0.94 (0.29, 2.33)	0.89 (0.35, 2.25)

Person-months	387.2		3769.6			

*Resulting in hospitalization or ER visit

^Adjusted for age, sex, race, and smoking

6.6 OTHER OUTCOMES

All of those who assessed change in other conditions reported improvement from baseline, with carbon monoxide showing the greatest improvement (94%) and appliance conditions showing the smallest amount of improvement (60%). (See Table 6.9.) None reported that conditions had worsened. Far fewer of these grantees could report whether these improvements were statistically significant (i.e., carbon monoxide, N=5; housing code violations, N=4; appliance conditions, N=3; physical comfort, N=4; radon, N=1; and structural hazards, N=6). Improvements related to carbon monoxide, appliance conditions, physical comfort, and structural conditions were the only cases where more statistically significant changes were reported than non-statistically significant changes.

TABLE 6.9: CHANGES REPORTED IN HOUSING CONDITIONS RELATED TO OTHER HEALTH OUTCOMES, AND THE STATISTICAL SIGNIFICANCE OF THOSE CHANGES

	N	Improved (N)	Worsened (N)	No Change (N)
CHANGES HOUSING CONDITIONS ASSOCIATED WITH CARBON MONOXIDE				
Change from baseline	17	94% (16)	0% (0)	6% (1)
Change from baseline-No Statistical Test Applied	12	92% (11)	0% (0)	8% (1)
Change from baseline-Not Statistically Significant	2	100% (2)	0% (0)	0% (0)
Change from baseline-Statistically Significant	3	100% (3)	0% (0)	0% (0)
CHANGES IN HOUSING CONDITIONS ASSOCIATED WITH HOUSING CODE VIOLATIONS				
Change from baseline	12	83% (10)	0% (0)	17% (2)
Change from baseline-No Statistical Test Applied	7	86% (6)	0% (0)	14% (1)
Change from baseline-Not Statistically Significant	2	100% (2)	0% (0)	0% (0)
Change from baseline-Statistically Significant	2	100% (2)	0% (0)	0% (0)
Change from baseline-Unknown if Test Applied	1	0% (0)	0% (0)	100% (1)

	N	Improved (N)	Worsened (N)	No Change (N)
CHANGES IN HOUSING CONDITIONS ASSOCIATED WITH APPLIANCES				
Change from baseline	10	60% (6)	0% (0)	40% (4)
Change from baseline-No Statistical Test Applied	4	75% (3)	0% (0)	25% (1)
Change from baseline-Not Statistically Significant	2	100% (2)	0% (0)	0% (0)
Change from baseline-Statistically Significant	1	100% (1)	0% (0)	0% (0)
Change from baseline-Unknown if Test Applied	3	0% (0)	0% (0)	100% (3)
CHANGES IN HOUSING CONDITIONS ASSOCIATED WITH PHYSICAL COMFORT				
Change from baseline	12	92% (11)	0% (0)	8% (1)
Change from baseline-No Statistical Test Applied	5	100% (5)	0% (0)	0% (0)
Change from baseline-Not Statistically Significant	1	100% (1)	0% (0)	0% (0)
Change from baseline-Statistically Significant	4	100% (4)	0% (0)	0% (0)
Change from baseline-Unknown if Test Applied	2	50% (1)	0% (0)	50% (1)
CHANGES IN HOUSING CONDITIONS ASSOCIATED WITH RADON				
Change from baseline	9	78% (7)	0% (0)	22% (2)
Change from baseline-No Statistical Test Applied	7	86% (6)	0% (0)	14% (1)
Change from baseline-Not Statistically Significant	1	100% (1)	0% (0)	0% (0)
Change from baseline-Unknown if Test Applied	1	0% (0)	0% (0)	100% (1)
CHANGES IN HOUSING CONDITIONS ASSOCIATED STRUCTURAL HAZARDS				
Change from baseline	14	86% (12)	0% (0)	14% (2)
Change from baseline-No Statistical Test Applied	7	86% (6)	0% (0)	14% (1)
Change from baseline-Not Statistically Significant	2	100% (2)	0% (0)	0% (0)
Change from baseline-Statistically Significant	4	100% (4)	0% (0)	0% (0)
Change from baseline-Unknown if Test Applied	1	0% (0)	0% (0)	100% (1)
CHANGES IN HOUSING CONDITIONS ASSOCIATED WITH WEATHERIZATION/ENEGERY EFFICIENCY				
Change from baseline	9	89% (8)	0% (0)	11% (1)
Change from baseline-No Statistical Test Applied	4	75% (3)	0% (0)	25% (1)
Change from baseline-Not Statistically Significant	3	100% (3)	0% (0)	0% (0)
Change from baseline-Statistically Significant	2	100% (2)	0% (0)	0% (0)

Seven grantees reported on other health outcomes, with most focused on some aspect of allergies or other respiratory conditions. Statistically significant improvements were reported by at least one grantee for child and adult physical health; one grantee reported no statistically significant improvements in children's behavior/attention spans; two reported no statistically significant changes in adult health or wellbeing. (See Table 6.C in Appendix 2.) One reported use of standardized measures: the Clinical COPD Questionnaire developed by Thys Van der Molen and the Medicare Health Outcomes Survey (developed by the U.S. Centers for Medicare and Medicaid Services).

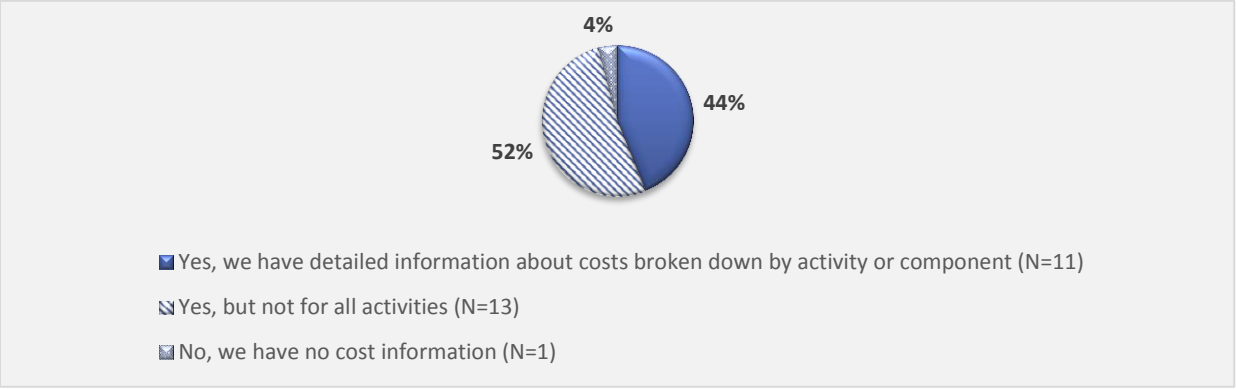
OTHER HEALTH OUTCOME MEASURES:

- **Body Mass Index (BMI);**
- **Changes in inspectors', landlords' and housing staff knowledge;**
- **Changes in children's mental and physical health, especially attention spans;**
- **Changes in adults' physical or mental health;**
- **COPD outcomes or allergy symptoms; and**
- **Changes in skin conditions, especially eczema.**

6.7 COSTS OF INTERVENTION

HUD OLHCHH, the Congress, and agency administrators have great interest in the cost of specific interventions. Grantees were first asked how their programs tracked costs. As illustrated in Figure 6.4, the majority (51%) tracked some costs, but not for all activities; 44% reported that they tracked activities and costs more systematically.

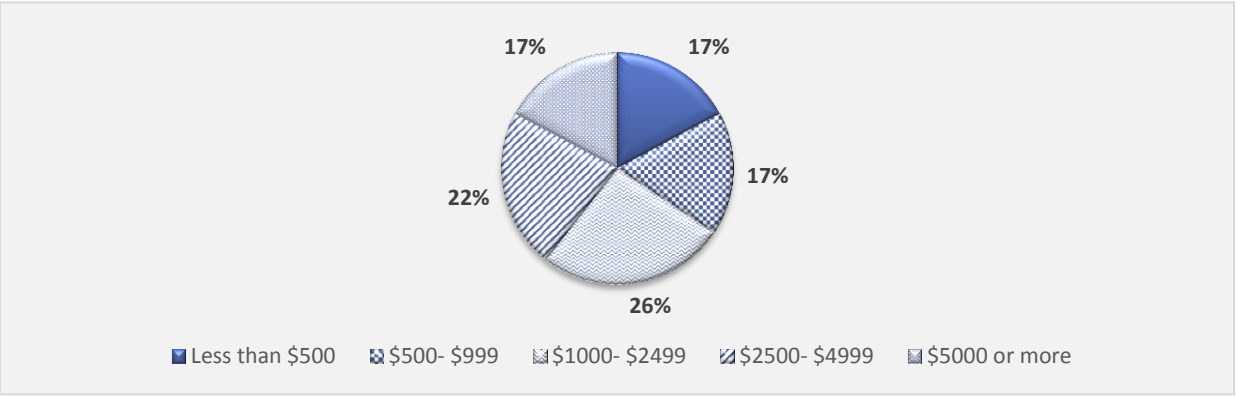
FIGURE 6.4: PERCENTAGE OF GRANTEES ABLE TO PROVIDE COST DATA (N=25)



All grantees that reported they collected at least some cost data were asked to report the mean cost of total repairs on a five-point scale (i.e., less than $500/unit, $500-$999, $1,000-$2,499, $2,500-4,999, and over $5,000). They also were asked to estimate the minimum and maximum for all physical intervention and clearance activities, regardless of whether they were able to break down the data by costs for specific types of interventions.

For those respondents who reported they could provide cost data, the majority reported overall costs of under $2,500 per unit (see Figure 6.5.)

FIGURE 6.5: ESTIMATED OVERALL COST PER UNIT FOR ALL PHYSICAL INTERVENTION AND CLEARANCE ACTIVITIES, BY GRANTEE (N=23)



Of the grantees who could provide more detailed breakdowns of mean per unit costs of intervention activities, a much larger percentage reported uncertainty or the inability to report costs for specific

categories of interventions, ranging from 18% for Indoor Air Quality interventions to 58% for the costs of weatherization and energy efficiency interventions.

TABLE 6.10 AVERAGE ESTIMATED COSTS PER UNIT REPORTED BY GRANTEES, BY TYPE OF INTERVENTION

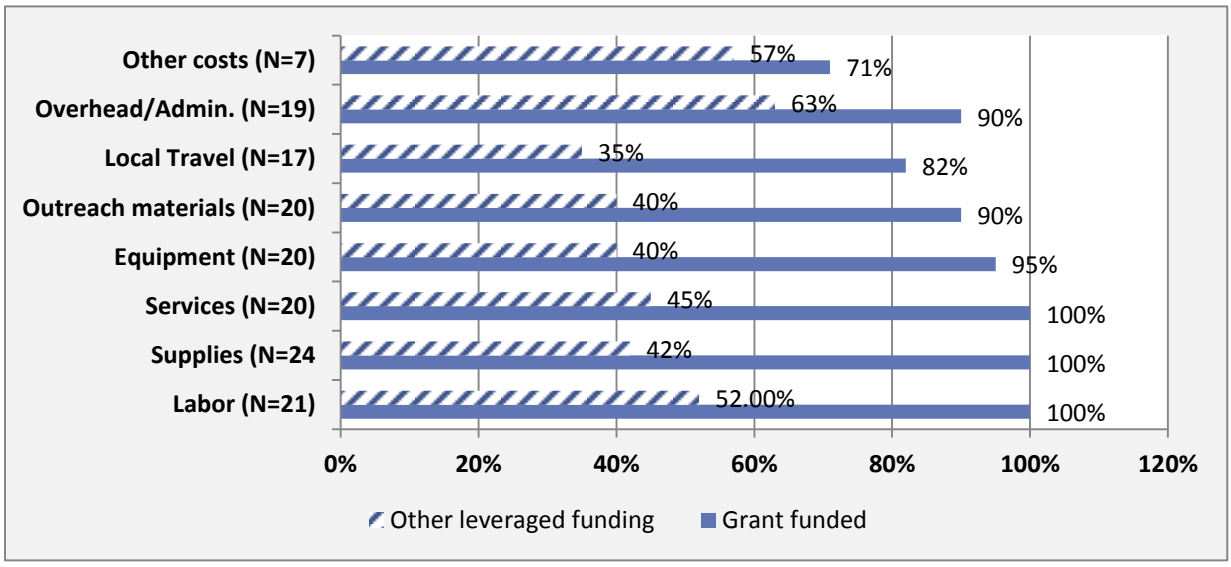
Type of Intervention	N	Less than $500	$500-$999	$1000-$2499	$2500-$4999	$5000 or more
Weatherization and energy efficiency activities	4	75%	0%	25%	0%	0%
Moisture control activities	8	38%	50%	0%	13%	0%
Lead hazard control activities	7	71%	0%	0%	14%	9%
Injury prevention activities	7	71%	29%	0%	0%	0%
Indoor air quality & allergen reduction activities	9	56%	33%	0%	11%	0%
IPM activities	7	100%	0%	0%	0%	0%

The costs captured in each of these estimates vary. Grantees could include up to eight different types of costs in their estimates: labor; supplies; equipment; services (e.g., professional pest management services, professional cleanings, etc.); outreach materials; local travel; overhead/administrative/indirect costs; and types of costs. For those grantees that provided any type of mean per unit costs, their cost estimates included a mean of 5.9 types of costs, with a median of seven types and a range of zero to eight types. They also indicated whether each of these cost categories included donated, in-kind leveraged, or other sources of funding as well as grant funding.

As illustrated in the following tables, there was variability in what grantees included in each cost category. This has a considerable impact on assessing the cost-effectiveness of the interventions, since the estimated cost of a per unit intervention category may include different costs from one grantee to another. However, Figure 6.6 illustrates that grantees used grant, leveraged/in-kind, and donated funds to cover many of their costs. Table 6.11 provides additional explanations on what grantees included in their cost calculations. When asked to identify which features of their program they considered most effective, 44% rated their ability to leverage resources and funding as one of their strongest elements.

This was stated most clearly in their comments on best practices and program successes. Table 6.12 provides details on some of the leverages.

FIGURE 6.6: PERCENT OF GRANTEES USING GRANT AND OTHER FUNDS, BY COST CATEGORY



Note: Percentages are based on the N for each category. Percentages do not sum to 100% because grantees could indicate "yes" to "grant-funded" and "other" separately.

TABLE 6.11: GRANTEE OBSERVATIONS ON ADDITIONAL COSTS INCLUDED IN THEIR ESTIMATES

Responses
Direct remediation costs included environmental treatment $42,853, Laboratory costs $825, housing improvements $90,949, healthy housing intervention tools $28,818, and staffing costs for the Healthy Homes Specialists, Community Education Coordinator, and the Project manager $402,190.
The total HUD award was $1,000,000, with $276,147 in matching funds. Personnel and Fringe benefits totaled $241,159 for City of Minneapolis staff. Our largest expenditure was in the Contracts/Sub-grantees and the Supplies and Materials categories, which were respectively, $469,137 and $263,710. Supply and material costs increased as we realized that we could perform additional assessments and interventions than originally anticipated.
Community Health Worker visits, follow-up calls, preparation and reporting time (80x2 to 3 visits plus calls) = $400 per unit and at total of $32,000.
During this grant period our target area was deeply affected by Spring weather-related disaster. During that period, many of our unit costs were very high, but we benefited from in-kind volunteer labor and donated materials.
Estimate only; labor only included for contracted work above and well beyond the $300 minimum and does not

include program staff time.
Healthy homes supplies: Vacuum, cockroach kits, pest eradication kits, rodent traps, and allergy control.
All costs are included in the estimate. However, 74 units received additional rehab work through other programs at an estimated cost of $18,817 per unit.
The HUD grant was 874,898. An additional $105,705 came in through program income. This City of Portland contributed almost $400,000, $294,877 of which was used to do physical home repair. The total program cost $1,863,303. Total clients served were 312, which results in cost per client at $5,972. Mean cost of supplies per family was $344.
We have very good numbers on the amounts paid to the remediation contractors for the actual remediation activities involving both the grant funded HH interventions as well as the leveraged HWAP interventions. The grantee and partner labor to administer these interventions per case is much more difficult to ascertain as the grant also conducted community-based activities that may not be reflected in the individual cases or that were involved in the lead up to the final cases (e.g., recruitment, qualification, triage visits, etc.).
Costs were tracked through a Contractor's Scope of Work/Remediation Prescription Checklist. We did not track specific hazards remediated, but would do this in the future for better program planning and evaluation.

TABLE 6.12: GRANTEE OBSERVATIONS ON THE EFFECTIVENESS OF FUNDING LEVERAGES

Responses
The overall partnerships with the Weatherization programs were the most significant component. This allowed for a more comprehensive and holistic intervention as well as maximizing the investment in the housing unit. It also permitted the weatherization of structures that may have previously been deferred due to healthy homes issues. Because all of our cases were occupied units with clients suffering from chronic respiratory disease, deferment was not a viable option. Because of more carefully detailed guidelines of the weatherization program, this work was most effectively done and its benefits were most immediately recognized by the residents in terms of comfort and reduced energy costs. The one weatherization measure most closely identified with health, tying Cleveland Drops to the furnace cold air return opening, was least recognized by residents though it eventually could have the most positive health effects on asthmatic children in the homes.
We were able to bring in an additional $105,000 in program income through targeted case management (Medicaid), which allowed us to increase our staffing level and services to clients.
The Healthy Homes Demonstration Grant Program played a key role in the development of the Green & Healthy Homes Initiative Baltimore Project, which is demonstrating how a comprehensive assessment tool and a single stream intervention model can be effectively integrated into a HUD Healthy Homes Demonstration Grant-funded project to produce whole house interventions that address indoor allergens, lead and safety hazards, structural defects, and energy loss comprehensively. The Safe at Home HHD Program should be looked on nationally as a proven model for how public housing and health department agencies can work effectively with private, non-profit agencies and HUD-funded Healthy Homes programs. Safe at Home and GHHI Baltimore are also proving that coordinated interventions are possible that reduce total costs, create efficiencies, and develop systems that address the remediation of home-based environmental health hazards in low income homes. The GHHI model plays a critical role in ensuring that housing interventions that address environmental hazards result in benefits for the child occupying the home by helping the child's family remain in the home through reduced energy costs and financial stresses that can lead to homeowner foreclosure and tenant eviction. Example: Three HHD client properties that received HUD Healthy Homes interventions were also weatherized and made more energy

efficiency through leverage funded interventions. The reduction in energy consumption in these homes produced energy cost savings of $678, $455, and $707 respectively (as documented by12 months pre- and post-intervention data analysis) that demonstrates how an integrated housing intervention approach can cost effectively produce enhanced benefits for low income families by both improving the safety of the home as well as improving the family's economic stability.

The GHHI Learning Network, Leading Innovation for Green and Healthier Tomorrow (LIGHT), and Whole House Assessment Triage (WHAT) partnership network that the Coalition developed in conjunction with the City of Baltimore has continued to verify the success that can be achieved in addressing severely deteriorated homes through a leveraged approach that cost effectively braids housing intervention resources to generate solutions to homes requiring more costly interventions. Through GHHI Baltimore's single portal intake, comprehensive assessment forms, enhanced interagency communication, and the use of intervention coordinators, varied funding streams were able to be aligned and coordinated to produce Green & Healthy Homes where housing defects and home-based environmental health hazards issues are resolved as well as reducing energy consumption and energy costs.

6.8 COST-EFFECTIVENESS OF INTERVENTIONS

Six grantees reported conducting a formal cost analysis, with 83% reporting it as cost-effective, and 17% reporting that the analysis was not complete. (See Figure 6.7.) The commentary provided suggests that the interventions selected were two to four times lower in costs that the costs to provide health care services for the conditions addressed.

FIGURE 6.7: GRANTEE ASSESSMENT OF COST-EFFECTIVENESS OF INTERVENTIONS (N=6)

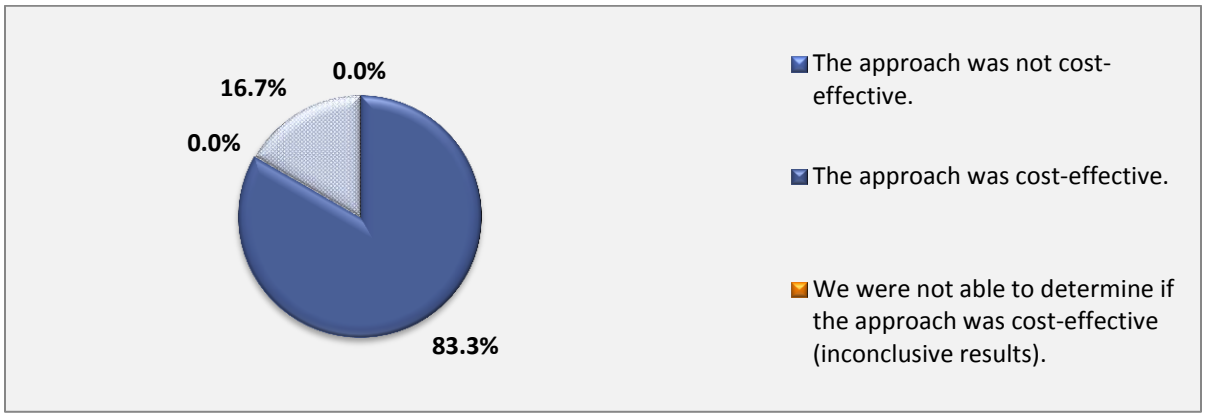


TABLE 6.14: GRANTEE OBSERVATIONS ON COST-EFFECTIVENESS OF INTERVENTIONS

Responses
The approach was cost-effective when comparing intervention cost (not including labor/overhead/travel) to estimated cost savings from reduced health care utilization.
The cost of products and inspections for one family was less than the cost of one hospitalization or emergency room visit. This was listed in detail in our final closeout report.
A HUD-funded Healthy Homes Technical Study is being conducted by the UMBC Hilltop Institute, University of Baltimore Jacob France Institute to measure health outcomes data, school attendance data, and energy costs reductions as well as a cost-benefit analysis of the GHHI model. The HHTS research study includes HHD program units that are undergoing detailed cost- benefit analysis.
The intervention was less than 2 emergency room visits. Costs were $2,062 ($2,482 if client participated in smoking cessation). ED visits in 2009 was $1,126. 3 emergency room visits costs $1,126X3=$3,378
We measured the cost effectiveness of the program as it relates to health care costs. We found that CAIR asthma clients were 3.5 times less likely to go to the ER after participating in the program. We also looked at ER visits by the whole family for all CAIR clients (not just asthma clients) and found that the family was 4 times less likely to use the ER after the program. We are still analyzing some of the data but the preliminary data shows that the program was cost effective.

CHAPTER 7: LESSONS LEARNED AND CONCLUSIONS

7.1 OVERVIEW OF LESSONS LEARNED AND SUSTAINABILITY

Grantees made a compelling case that funding for the Healthy Homes Demonstration Grants should be restored, based on the outcomes of their projects, their contributions to the implementation of the federal inter-agency strategy *Advancing Healthy Housing: A Strategy for Action*, and their success in sustaining healthy homes program components after their grant ended. Many of the key takeaway messages/lessons learned on program design, management, and sustainability are consistent with the findings and recommendations in HUD OLHCHH's 2012 *Healthy Homes Program Guidance Manual*. Recognizing that there are many ways to define sustainability, grantees discussed whether tools or procedures they developed remain in use, staff received training, organizational changes were made to increase effective service delivery, and additional regulatory or administrative support and funding were needed and obtained. In general, grantees reported considerable success in sustaining many aspects of their programs.

7.2 OVERALL PROGRAM STRENGTHS AND CHALLENGES

Grantees could rate up to 10 items they considered the strongest or most effective features of their programs. All rated collaboration and partnerships as one of the most effective, with educational approaches, ability to identify high-risk population targets, and the housing interventions selected as the next most successful features (80%, 72%, and 60%, respectively). (See Figure 7.1.) They could rate up to 14 items as challenges, and indicate the severity of each challenge (e.g., not a challenge, sometimes, or frequently a challenge). Cost constraints represented the most frequently mentioned challenge, with 80% of grantees rating this as sometimes or frequently a challenge, followed by resident fears of landlord repercussions (72%), obtaining consent of the property owner and meeting timeframes (68%, respectively), and getting landlords/owners to do work and getting access to the unit itself (64%, respectively). (See Table 7.1.) Activities least likely to be a challenge included relocating residents (80% of grantees rated this as not a challenge), obtaining a timely environmental review (76%), or changes in the target area or population (68%). Fewer grantees (N=22) answered the question of whether they encountered a challenge that they couldn't overcome, with only 41% indicating that they had faced such

situations. The most common insurmountable challenges mentioned included running out of funds or inability to spend all the funds awarded, absentee landlords, more interest in the program than they had funds to serve, Davis-Bacon requirements, inconsistent participation by partners or sub-grantees, and housing stock that was too deteriorated to serve with program funds. Grantee comments on effectiveness, best practices, challenges, and least effective features of their programs are grouped by categories of "Lessons Learned" in this chapter and in Appendix 2.

FIGURE 7.1: ASPECTS OF THEIR PROGRAMS THAT GRANTEES RATED AS STRONGEST OR MOST SUCCESSFUL (N=25)

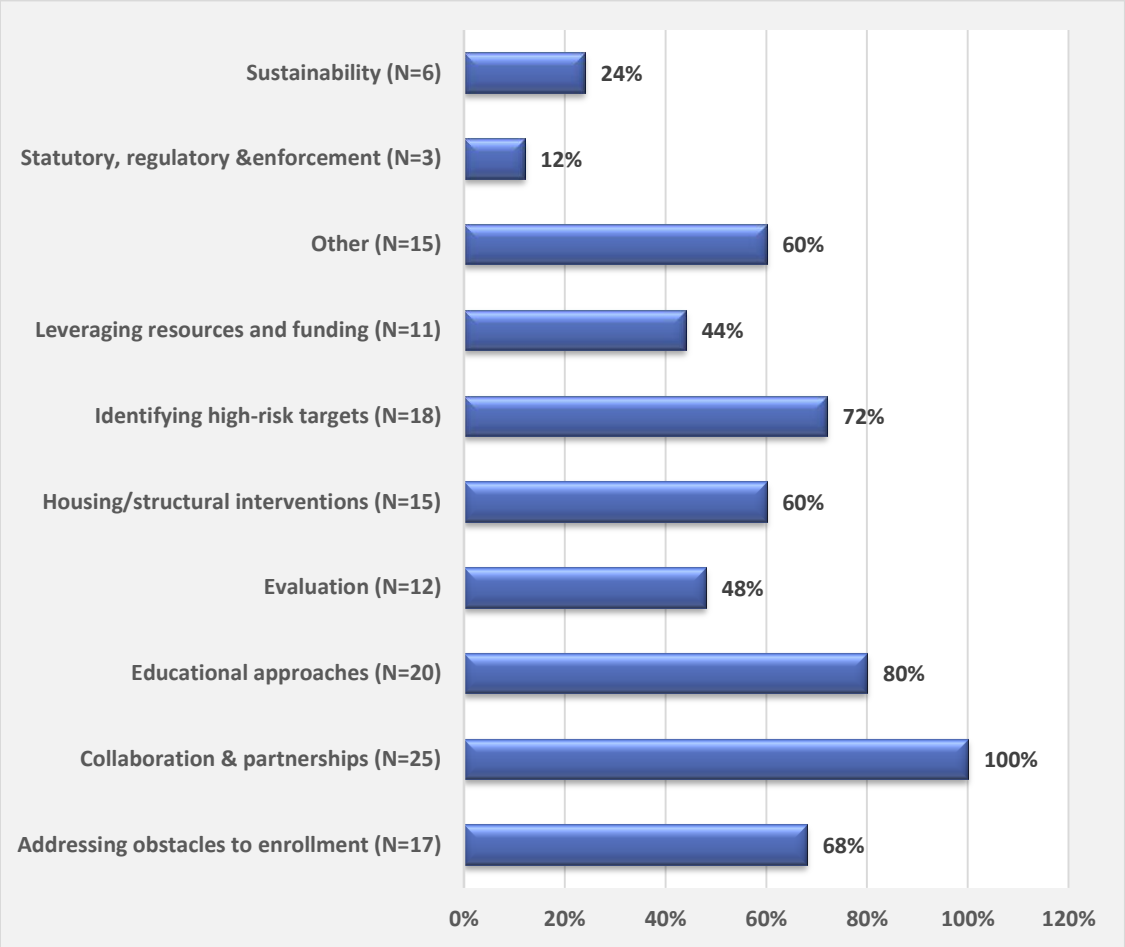


TABLE 7.1: PERCENT OF GRANTEES REPORTING FREQUENCY OF IMPLEMENTATION CHALLENGES, BY EXTENT OF CHALLENGE AND CATEGORY (N=25)

Question	Not a challenge (N)	Sometimes a challenge (N)	Frequently a challenge (N)
Cost constraints	20% (5)	48% (12)	32% (8)
Obtaining reliable contractors	52% (13)	40% (10)	8% (2)
Obtaining qualified contractors	48% (12)	44% (11)	8% (2)
Obtaining consent of the property owner	32% (8)	56% (14)	12% (3)
Meeting timeframes	32% (8)	52% (13)	16% (4)
Getting into housing units	36% (9)	52% (13)	12% (3)
Contractual issues	64% (16)	36% (9)	0% (0)
Obtaining timely environmental review	76% (19)	24% (6)	0% (0)
Getting landlords/homeowners to do work	36% (9)	36% (9)	28% (7)
Relocating residents	80% (20)	20% (5)	0% (0)
Question	**Not a challenge (N)**	**Sometimes a challenge (N)**	**Frequently a challenge (N)**
Working with residents whose first language is not English	52% (13)	44% (11)	4% (1)
Residents fearful of repercussions from landlord	28% (7)	44% (11)	28% (7)
Change in target area or population	68% (17)	28% (7)	4% (1)
Other (N=12)	25% (3)	50% (6)	25% (3)

7.3 LESSONS LEARNED ON RECRUITMENT, ENROLLMENT, AND RETENTION

Grantees' observations on recruitment, enrollment and retention were reported in Chapter 4, but additional items were raised in the context of their assessment of challenges and best practices. Table 7.2 summarizes those lessons from both chapters. Tables 7.A and 7.B in Appendix 2 provide additional

grantee commentary on challenges encountered, ways to overcome those challenges, and challenges that could not be addressed.

TABLE 7.2: SUMMARY OF LESSONS LEARNED ON RECRUITMENT, OUTREACH AND EDUCATION

Factor	Lessons
Gaining resident trust	• Do not let much time elapse between receiving a referral and contacting a client. • Use word-of-mouth and introductions, door to door outreach if the neighborhood is seen as open to contact with strangers and recruitment through trusted sources. • Provide one-on-one communication tailored to family needs, not generalized education materials. • Take into account cultural differences: use bilingual staff or interpreters; hire Community Health Workers from the communities served; and partner with refugee services. • Use testimonials and experience of others who have received services in the community as a way to build trust. • Be non-judgmental, listen actively, and demonstrate the ability to address unmet needs through appropriate referrals; maintain a sense of humor. • Involve physicians who are engaged in target clients' care and nurses with home visiting experience as recruitment partners. • Dedicate personnel who can assess both income and health qualifications. • Keep the program visible through community events, signs, etc. Make recruitment convenient through events in target areas.
Addressing resident fears of repercussions by landlords	• As part of enrollment, identify whether the family has a lease and whether they are in good standing with the landlord. • Explain rights to a healthy home. • Provide referrals to community legal support or include legal services as part of program services. • Serve as advocates. • Explain/support rent escrow procedures in landlord/tenant disputes.
Retaining clients	• Build on the waiting lists for other programs. • Appointment reminders. • Confine the follow up period to a shorter time frame – at six months, there may be more residents who choose not to follow up. • Provide incentives at each visit, including the last visit, to ensure retention. • Frequent contact to verify location and phone numbers. Get permission to text messages to clients who have mobile phones.
Overcoming landlord/property owner resistance to enroll	• Link with code compliance inspectors to demonstrate how grant participation benefits the landlords; also be prepared to cite landlords who will not comply if code violations are identified. • Identify cost/benefits to owners/landlords. • Provide leverages or "braid" funding streams (e.g., lead hazard control, weatherization, CDBG, etc.) to address multiple hazards that were too costly to be addressed by the

	grant alone. • Recognize that landlord incentives to enroll in the program depend on market conditions: in a "tight" rental market, there are fewer incentives to enroll. • Make the enrollment process easy for both the tenant and the landlord. • Multi-family rental units may be easier to enroll if the entire building can be served by the program, not just one unit. • Focus on locally-based landlords; absentee/out of state landlords may harder to contact, less interested in the program services, and also less likely to complete repairs if this is a required match/leverage for the program. • Make the timing of repairs convenient (e.g., weekends, evenings when owners can be onsite). • Conduct more modest interventions that do not require landlord involvement.
Define target carefully	• Avoid too narrow a target (e.g., only foster care homes, too small a geographic area). • Avoid too broad enrollment criteria for clients or city-wide enrollment.

7.4 LESSONS LEARNED ON ASSESSMENT

Grantees' observations on assessment have been reported in Chapter 5, but additional items were raised in the context of their assessment of challenges and best practices. Table 7.3 summarizes those lessons from both chapters. Tables 3.A, 5.A, 5.B and 7.C in Appendix 2 provide additional grantee commentary on challenges encountered, ways to overcome those challenges, and challenges that could not be addressed.

TABLE 7.3: SUMMARY OF LESSONS LEARNED ON ASSESSMENT

Factor	Lessons
All assessments	• Use tested tools and protocols. • Plan for delays if IRBs are required. • Collect only the data that the program can use. Many grantees ran out of time/resources to conduct more elaborate data analysis. • Electronic tools should be available for use in the field and not dependent on wireless connections. • If wireless connections are required, the program should provide a wireless access card. • All assessment tools should allow the assessor to record specific observations, as well as check categories. • Electronic tools used in the field should be configured for tablet, notebook, or laptop use. Cell-phone size is too small for easy use, especially if data need to be reported in a table form. • The program should provide a database that allows for easy upload of field assessments.

	• Resident retention and follow-up will be improved if the follow-up assessment occurs within three months or less from time of intervention.
Environmental samples	• Cost of environmental sampling can be high; programs need to price samples carefully. • Follow the HUD OLHCHH QA Protocols.
Resident assessments	• Include medication management issues when doing asthma-related assessments. • Include mental health and neighborhood safety concerns. • Do not rely on residents to know the age of housing; access this information from tax assessor databases.

7.5 LESSONS LEARNED ON INTERVENTIONS

Grantees' observations on interventions were reported in Chapters 5 and 6, but additional items were raised in the context of their assessment of challenges and best practices. Table 7.4 summarizes those lessons from both chapters. Tables 5.B, 7.D, and 7.E in Appendix 2 provide additional grantee commentary on challenges encountered, ways to overcome those challenges, and challenges that could not be addressed.

TABLE 7.4: SUMMARY OF LESSONS LEARNED ON INTERVENTIONS

Factor	Lessons
Improving education and behavioral changes	• Link education to producing observable behavioral changes in the home at each visit. • Tailor educational messages to family needs/ability to implement change. • Link incentives to correspond to educational messages at each visit. • Smoking cessation is a particularly hard behavioral change and will require additional resources (e.g., cessation programs, client support, and medication). Simply referring a client to other programs will not be sufficient to see changes.
Building a contractor base	• If there are other renovation/repair programs in the area, work with them to obtain a list of reliable firms. Weatherization contractors should be included on this list. • Monitor work and costs closely. Be very specific in scopes of work. Drop contractors quickly who do not meet expectations. • Contractors with multiple certifications (e.g., lead abatement; HWAP, cleaning) may be hard to find. Programs may need to build lists of contractors with specialty certifications and schedule work accordingly. • In competitive markets, schedule several homes at a time to make the bidding process more attractive. Or, pre-qualify a group of contractors for a time period and assure that each will get a percentage of work.
Knowing when to walk away	• In multi-unit rental housing, repairs to all units may be more effective than repairs to single units, as well as encourage owner engagement. • Whenever possible, "braid" funding streams – for projects that need more funding than

	can be provided by the grant, coordinate enrollment to qualify the unit for other programs. • Overcrowding in the unit or excessive clutter will delay repair work. Build in criteria at enrollment to eliminate these units, or engage specialists in these conditions as partners for referral and education.

7.6 LESSONS LEARNED ON PARTNERSHIPS AND TRAINING

Grantees' observations on partnerships and training were reported in Chapter 4, but additional items were raised in the context of their assessment of challenges and best practices. Table 7.5 summarizes those lessons from both chapters. Tables 7.F and 7.G in Appendix 2 provide additional grantee commentary on challenges encountered, ways to overcome those challenges, and challenges that could not be addressed.

TABLE 7.5: SUMMARY OF LESSONS LEARNED ON PARTNERSHIPS AND TRAINING

Factor	Lessons
Improving the referral process	• Work with established networks of home visiting, hospital, and primary care systems for obtaining services and follow up. Create electronic and fax forms to assure complete referral information. • Address HIPAA issues in the enrollment process. Ensure that consents give all partners access to the appropriate protected health information for their role in the program. • Engage partner organizations when the program encounters problems with recruitment or resident compliance. Conduct weekly/monthly case review sessions. • Recognize that staff turnover can occur at partner sites. Have written policies and procedures that state performance expectation for partners.
Conducting joint home visits	• When possible, have one staff member doing environmental assessments/sampling while another does client education. This promotes staff safety and demonstrates respect for the resident's time. • Know the cultural issues that are associated with home visits (e.g., can a man enter the home without a male from the family present?).
Coordinating service delivery	• This is a time-consuming process, and must be planned in advance. • MOUs (Memoranda of Understanding), subcontracts, and monitoring criteria should be in place before enrollment starts. • Implement subcontracts with performance criteria. Drop subcontractors quickly if they do not meet performance criteria. • Know the enrollment criteria for each partner's program. Know what services have already been provided before the grant program starts its work. Have a plan for follow-up by partner organizations when grant-related work ends.

Improving training	• Use standardized curricula. • Have refresher training for all staff and partner organizations. • CHWs/promotores should be trained in visual assessment procedures and as Certified Asthma Educators. • Include resident organizations, affordable housing organizations, and code inspectors in training to improve sustainability. • Keep track of certifications for all staff and ensure that re-certification is completed in a timely manner.

7.6.1 SKILLS TRAINING

Grantees reported training a mean of 6.1 out of a possible 10 categories of individuals or groups, with a range of three to 10 groups. The groups most frequently trained were grantee or partner staff (92%), residents/tenants (72%), and property owners and remodelers/contractors (64%, respectively). Code inspectors were the least likely to be trained by grantees (48%). (See Figure 7.2.) This survey did not ask grantees to estimate how many individuals in total received training. Additional examples of staff trained are presented in Table 7.6.

FIGURE 7.2: PERCENT OF GRANTEES PROVIDING SKILLS TRAINING TO INDIVIDUALS OR GROUPS (N=25)

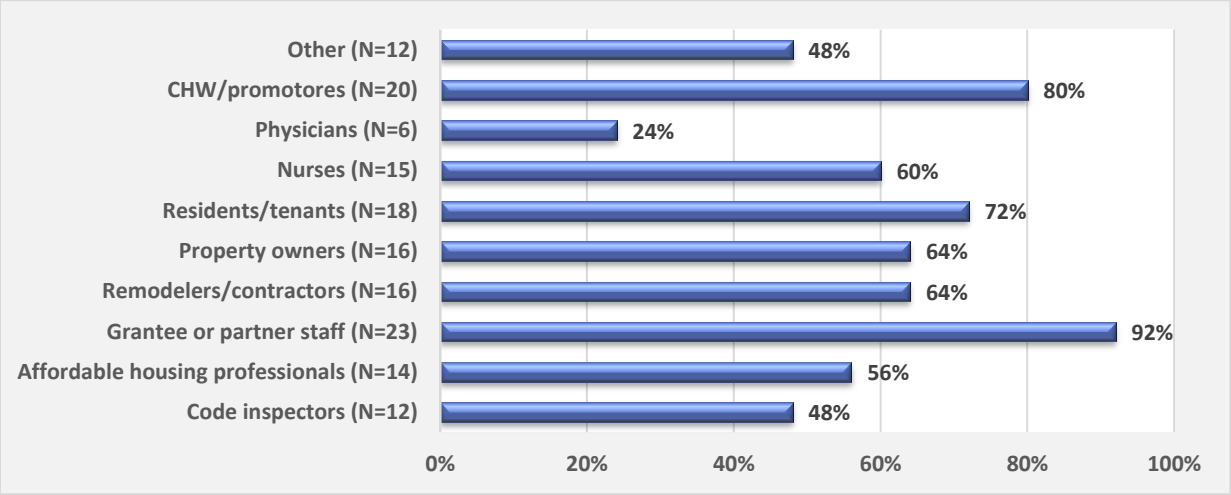


TABLE 7.6: GRANTEE RESPONSES FOR "OTHER" IN SKILLS TRAINING FOR INDIVIDUALS OR GROUPS

Responses
Interns supported our infrastructure: making calls, dropping off supplies, and promoting smoking cessation efforts.
We used legal to provide mediation and advice to tenants, landlords, and medical professionals.
Staff from referring agencies that were involved with housing.
NSD housing rehab specialist, community workers, administrative staff, and Weatherization program energy auditors.
Childcare workers
Early intervention professionals, Head Start, Child care providers, Visiting Nurses Associations, and Teachers.
Long Beach Alliance for Children with Asthma, CHWs, Housing and Code Enforcement Inspectors, Lead Hazard Control Inspectors and Environmental Health Staff.
Tribal housing tenant reps; tribal housing professionals.
Healthy Homes Practitioner, Maryland Lead Workers, Maryland Lead Supervisor, and EPA RRP Rule Renovator courses provided.
Community-based parent education.
Provider Office staff, public health staff, community organization staff.
As part of the national Tribal Healthy Homes trainings that were conducted across the U.S., the staff/training participants consisted of: Tribal Housing staff, Tribal Health/IHS personnel, daycare providers, Tribal EPA personnel, and others.

7.7 LESSONS LEARNED ON PROGRAM MANAGEMENT

Grantees' observations on program management have been reported throughout this document, but additional items were raised in the context of their assessment of challenges and best practices. Table 7.6 summarizes those lessons described in previous chapters. Tables 7.H and 7.I in Appendix 2 provide additional grantee commentary on challenges encountered, ways to overcome those challenges, and challenges that could not be addressed.

TABLE 7.7: SUMMARY OF LESSONS LEARNED ON PROGRAM MANAGEMENT

Factor	Lessons
Improving program design	• Integrate medical case management with repairs; collaborate with local health departments. • Use interns, YouthBuild, and apprentice programs to supplement available grant funding for staff.

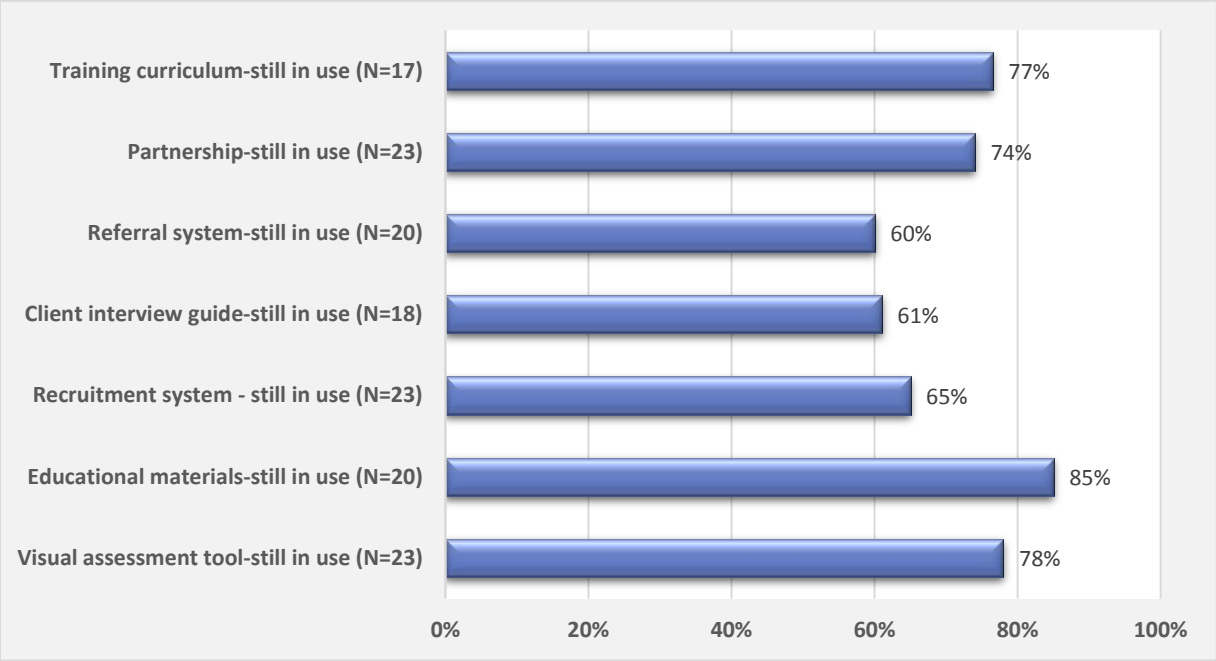
	• Stress quality control for data collection. • Allow enough time for regular data analysis. Do not leave evaluation to the end of the grant. • Have an easy-to use data management system. Do not rely on one staff person to enter all data. • Monitor staff performance regularly. • Engage all staff in problem-solving. Conduct weekly case reviews. • Only 4 of the grantees received ARRA (American Recovery and Reinvestment Act) funding, which required adherence to Davis-Bacon requirements. In the future, however, programs should be aware of Davis-Bacon provisions in their area and understand the impact on their costs for services. • Grantees have made strides in their ability to streamline historic preservation requirements, environmental reviews, and relocation. In the future, HUD OLHCHH should be able to provide links to model documents for future grantees as part of its Notice of Funding Availability.

7.8 SUSTAINABILITY

There are many ways to define sustainability. In this evaluation, grantees discussed whether tools or procedures that they developed remain in use, staff received training, organizational changes were made to increase effective service delivery, and additional regulatory or administrative support and funding were needed and obtained. Overall, grantees reported considerable success in maintaining components of their healthy homes program at the end of their grants.

At the time of the evaluation, over 70% of the grantees reported the tools or procedures they developed or adapted were in use by their programs or by others after the grant ended. Grantees reported a mean of 3.7 tools still in use, with a range of one to eight. Those most commonly in use tools were educational materials (85%, N=20)), visual assessments (78%, N=23), training curriculum (77%, N=17), and partnerships (74%, N=23). (See Figure 7.3.)

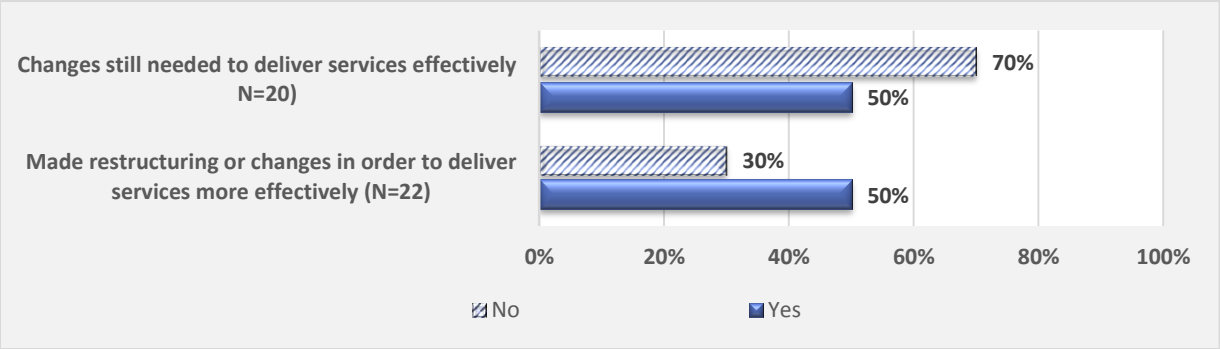
FIGURE 7.3: PERCENT OF GRANTEES WHO REPORTED DEVELOPING OR ADAPTING A TOOL ORE STRATTEGY FOR THEIR PROGRAMS' THAT ARE STILL IN USE, BY CATEGORY



Note: Percentages based on the N reported for each category of tool in use that had been developed for the program, not N=25.

The majority of grantees also reported they made organizational changes to deliver their services effectively, but 50% (N=20) reported more changes were still needed. (See Figure 7.4.)

FIGURE 7.4: PERCENT OF GRANTEES WHO MADE OR STILL NEEDED TO MAKE ORGANIZATIONAL CHANGES TO DELIVER SERVICES MORE EFFECTIVELY



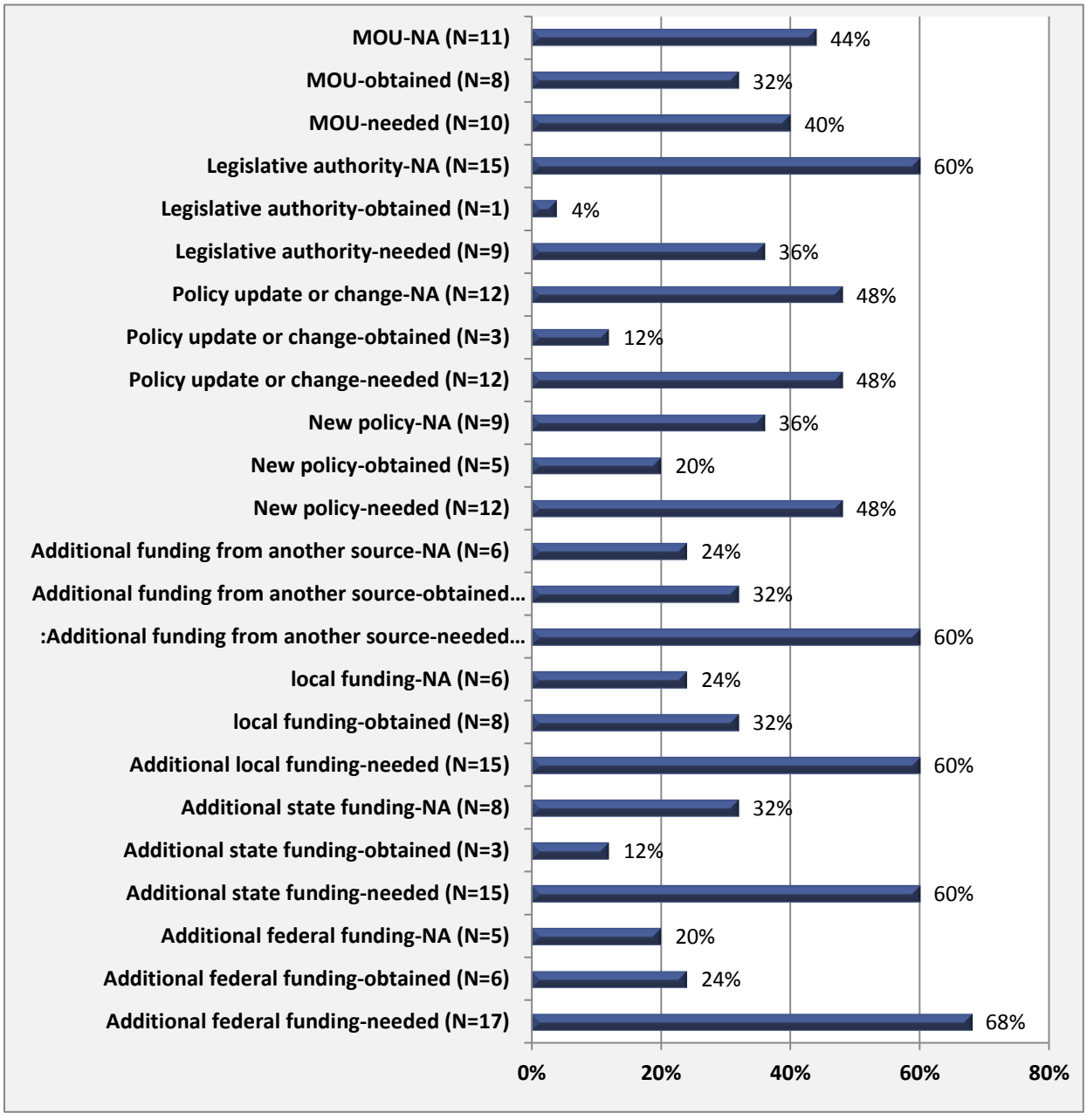
Note: Percentages based on the N reported for each response; this does not include N of those who skipped question.

Grantees could report whether they still needed, and obtained, any of eight legislative, regulatory, or funding actions since their grant ended. In general, grantees did not report that they needed more administrative or legislative support, but did report a need for more funding (68% needed more federal funding, 60% needed more state, local, or other funding). (See Figure 7.5.)

The majority reported they did not need additional legislative authority (60%, N=15). Fewer reported a need for policy changes (48%, N=12), or additional Memoranda of Understanding between agencies or organizations (44%, N=10). Those who reported a need for these authorities had varied success in obtaining them, ranging from 4% (N=1) that obtained legislative authority to 32% (N=8) that executed new MOUs.

Success in obtaining additional funding ranged from 32% (N=8) for local or other funding, 20% (N=6) for federal funding, and 12% (N=3) for state funding.

FIGURE 7.5: PERCENT OF GRANTEES THAT REPORTED NEEDING, OBTAINING, OR NOT NEEDING ACTIONS TO SUSTAIN THEIR PROGRAMS, BY CATEGORY OF ACTION (N=25)



*Percentages of obtained are based on the responses of the 25 grantees as a whole, and not as a percentage of those who indicated a need.

** NA is interpreted as the action was not needed.

7.9 CONTRIBUTIONS OF GRANTEES' ACTIVITIES TO THE GOALS OF *ADVANCING HEALTHY HOUSING: A STRATEGY FOR ACTION*

Collectively, the grantees' performance suggest they have contributed significantly to achievement of goals and objectives articulated in the Federal Interagency Working Groups' *Advancing Healthy Housing: A Strategy for Action.* (See Table 7.8.) This supports their commentary on the need for restoration of HHD funding.

TABLE 7.8 SUMMARY OF GRANTEE CONTRIBUTIONS TO THE FEDERAL INTERAGENCY WORKING GROUP STRATEGY, BY PRIORITY ACTION

Priority Action	Grantee Contributions to this Priority

Goal 2 - Encourage Adoption of Healthy Homes Criteria	• 40% reported a need for additional MOUs with agencies or organizations; 32% obtained them.
	• 76% reported partnerships with weatherization programs; 52% with K-12 programs in schools; 48% with early education programs; and 36% with local businesses.
	• 50% of the grantees reported training six of 10 possible audiences in skills associated with healthy homes assessment and intervention.
	• 82% of the grantees rated their ability to identify and target high-risk populations as one of the strongest features of their programs.
	• The 25 grantees enrolled:
	  • 4,517 occupants under age 6;
	  • 5,434 occupants aged 7 – 17;
	  • 6,248 occupants aged 18-64;
	  • 187 occupants over age 65; and
	  • 6,248 occupants with asthma.
	• The 25 grantees enrolled:
	  • 3,101 housing units in total;
	  • 1,595 rental units;
	  • 776 units built before 1940; and
	  • 971 units build between 1940 and 1978.

	• The majority of grantees reported improvements post-intervention in 16 housing conditions, with improvement ranging from 53% to 100% in individual conditions. • 60% of the grantees rated their housing interventions strategies as one of the strongest features of their programs.
	• 44% of grantees rated their ability to leverage funding as one of the strongest features of their program. • 35% to 63% reported obtaining leverages (donated, in-kind, or other leveraged funding) for eight different categories of program expenses.

Goal 3 - Create and Support Training and Workforce Development to Address Health Hazards in Housing	50% of the grantees reported training six of 10 possible audiences in skills associated with healthy homes assessment and intervention.
	• 60% of grantees made formal presentations to elected officials or community groups. • 12% of grantees considered their ability to leverage statutory, regulatory, and enforcement activities as one of the strongest features of their programs.
	• 16% of the grantees received ARRA funding
Goal 4 - Educate the Public about Healthy Homes	• 109,169 individuals were reached through community awareness activities, over and above those reached through recruitment or enrollment efforts. • 50% of the grantees used five out of 10 possible communication methods for community outreach. • 40% used broadcast media as part of community outreach.
Goal 5 - Support Research that Informs and Advances Healthy Housing in a Cost-Effective Manner	• 18 published articles in peer-reviewed journals; over 100 presentations at professional conferences.
	• 64% of grantees can make raw or cleaned de-identified data sets available to HUD OLHCHH for further analysis.
	• The eight core asthma outcome measures identified in the survey, as well as the other measurement tools grantees developed, provide the basis for standardizing future performance measures. • Over 80% of the grantees surveyed performed outcome-based evaluations. • Although few grantees conducted formal cost analyses, half of the grantees could provide detailed information on the cost of at least one individual interventions. Several could compare costs of interventions to medical cost reductions.

7.10 CONCLUSIONS

Grantees believed that the HHD grants should be returned to a separate grant category, rather than as an adjunct to the Lead Hazard Control Grants (see Appendix 2, Table 8.A) Among the factors that they cited to support this position were:

1. The need for continuity of healthy homes services. Many communities may not need a lead hazard control program, but do require asthma- and injury-related interventions;
2. The need for continuity of partnerships, materials, and training. The effort to train staff to assist with asthma- and IPM-related interventions is initially costly. Once these staff members are trained, however, they can be deployed in other programs. Without sustained funding, the

mechanisms to achieve these partnerships are difficult to build and support. Several grantees observed that their programs closed once grant funding ended; and

3. The ability to support requests for Medicaid reimbursement of services. The available funding for healthy homes activities under the Lead Hazard Control grants is not sufficient to show the costs and benefits of medical management and home visiting, as well as efforts to justify inclusion of certain equipment, such as air cleaners, and medical devices.

Their contributions to the overall improvement in housing outcomes, and the benefits to resident health, make a compelling case this grant funding has been well-spent. Among these benefits were:

1. Relatively low cost interventions;
2. Demonstrated ability to leverage federal funding with other sources, thus building capacity and ensuring that communities' support for healthy homes interventions will grow in the future;
3. Rigorous methodology to demonstrate that housing conditions improved after Healthy Homes – related interventions;
4. Documented improvements in the health of individuals served by the grantees, especially in the area of asthma outcomes. This supports the message that health care costs can be reduced through remediations to the home; and
5. Clear evidence that the HHD and Healthy Homes Production grants have contributed to the goals of the Federal Interagency Working Group's *Advancing Healthy Housing: A Strategy for Action.*

APPENDIX 1: LIST OFHHD GRANTEE PROGRAMS

Grantee	Grant #	Title of Project	Start/End Date	Project Director	Primary Contact	Secondary Contact	HUD Data Contact
Alameda County, CA	CALHH 0205-09	Alameda County Healthy Homes Project	05/2010-05/2013	Maricela Foster	Dale Hagen Alameda County Healthy Homes Department Housing Programs, Director 2000 Embarcadero #300 Oakland, CA 94606 dale.hagen@acgov.org 510-567-8298	Doug Henderson Doug.Henderson@acgov.org 510-567-8264	Dale Hagen dale.hagen@acgov.org 510-567-8298
American Lung Association of the Upper Midwest, MN	MNLH H0157 -07	TEACH - Tribal Environmental Action for Children's Health	04/2011-03/2014	Jill Heins	Jill Heins ALAUM 490 Concordia Avenue St. Paul, MN 55103 Jill.heins@lung.org 651-223-9578	N/A	Jill Heins Jill.heins@lung.org 651-223-9578

Boston Public Health Commission, MA	MALHH0207-09	The Healthy Section 8 and Affordable Housing Demonstration Project	05/2010-04/2013	Eugene Barros	Eugene Barros Boston Public Health Commission Associate Division for Healthy Homes and Community Supports 1010 Massachusetts Avenue Boston, MA 02118 ebarros@bphc.org 617-534-2670	N/A	Eugene Barros ebarros@bphc.org 617-534-2670
Case Healthy Homes and Patients Program (CHHAP2), OH	OHLHH0164-08	Case Healthy Homes and Patients Program--2	01/2009-12/2012	Dorr G. Dearborn, PhD, MD	Dorr Dearborn Case Western Reserve University School of Medicine 10900 Euclid Avenue Cleveland, OH 44106-4940 Dorr.dearborn@case.edu 216-368-8521	Stuart Greenberg Stuart.greenberg@ehw.org 216-961-4646	Dorr Dearborn Dorr.dearborn@case.edu 216-368-8521
Children's Mercy Hospitals and Clinics/The Kansas City Safe and Healthy Home Partnership (KCSHHP), MO	MOLHH0159-07	Kansas City Safe and Healthy Home Partnership (KCSHHP)	01/2008-12/2012	Kevin Kennedy	Kevin Kennedy Children's Mercy Hospitals and Clinics Center for Environmental Health 2401 Gillham Road Kansas City, MO 64108 kkennedy@cmh.edu 816-960-8918	Ryan Allenbrand rnallenbrand@cmh.edu 816-960-8925	Kevin Kennedy kkennedy@cmh.edu 816-960-8918

Cleveland and Cuyahoga County, OH	OHLHH0208-09	Cleveland and Cuyahoga County Healthy Homes Initiative 3	04/2010-04/2013	John Sobolewski	John Sobolewski, RS, Cuyahoga County Board of Health 5550 Venture Drive Parma, OH 44130 jsobo@ccbh.net 216-201-2001 x 1515	Stephanie McConoughey smcconoughey@ccbh.net 216-201-2001 x 1244	John Sobolewski jsobo@ccbh.net 216-201-2001 x 1515
Coalition to End Childhood Lead Poisoning, MD	MDLHH0206-09	Safe at Home Baltimore Healthy Homes Demonstration Grant	05/2010-04/2013	Ruth Ann Norton	Wes Stewart Green & Healthy Homes Initiative, Senior Director of Technical Assistance and Legal Services 2174 Hudson Street Baltimore, MD 21224-4716 gwstewart@ghhi.org 410-534-6447	Ruth Ann Norton ranorton@ghhi.org 410-534-6447	Wes Stewart gwstewart@ghhi.org 410-534-6447
City of Columbus Public Health, OH	OHLHH0165-08	Columbus Health Homes Demonstration Grant	06/2009-06/2012	Phillip Bouton	Phillip Bouton Columbus Public Health Program Manager 240 Parsons Ave Columbus, OH 43215 pbouton@columbus.gov 614-645-6226	N/A	Phillip Bouton pbouton@columbus.gov 614-645-6226

Esperanza Community Housing Corporation - The South Los Angeles Healthy Homes Demonstration Project, CA	CALHH0176-08	South Los Angeles Demonstration Project	04/2009-03/2012	Nancy Halpern Ibrahim	Gabriela Gonzalez Esperanza Community Housing-Project Manager 3655 S. Grand #280 Los Angeles, CA 90007 gabriela@esperanzacommunityhousing.org 213-748-7285 x 227	Monic Uriarte Monic@esperanzacommunityhousing.org 213-748-7285 x 22	Gabriela Gonzalez gabriela@esperanzacommunityhousing.org 213-748-7285 x 227
County of Harris, TX - ARRA	TXLHH0179-08	Safe and Healthy Homes Program	05/2009-04/2012	Marilyn Christian	Richard Williams Public Health Services – Supervisor 101 S. Richey, Suite G Pasadena, TX 77506 rwilliams@hcphes.org 713-274-6319	N/A	Richard Williams rwilliams@hcphes.org 713-274-6319
Highline Communities Healthy Homes Program/King County Housing Authority, WA	WALHH0186-08	Highline Communities Healthy Homes Project	04/2009-04/2012	Nikki Parrott	Joel Gregory King County Housing Authority 700 Andover Park West Suite D Tukwila, WA 98188 joelg@kcha.org 206-214-1249	Jill Breysse jbreysse@nchh.org 443-539-4155	Sherry Dixon sdixon@nchh.org 443-539-4156

Kenosha County Communities Partnership, WI	WILHH0180-08	Kenosha County Communities Partnership	04/2009-04/2012	John Jansen	Pat Shumaker Project Coordinator 8600 Sheridan Road Suite 600 Kenosha, WI 53143 patricia.shumaker@kenoshacounty.org 262-605-6735	N/A	Pat Shumaker patricia.shumaker@kenoshacounty.org 262-605-6735
Long Beach Healthy Homes Demonstration Program, CA	CALHH0188-08	City of Long Beach Healthy Homes Demonstration Program	04/2009-04/2012	Judeth Luong	Judeth Luong Grant Program Manager 2525 Grand Avenue Long Beach, CA 90815 Judeth.Luong@longbeach.gov 562-570-4104	Kathy Estrada Kathy.Estrada@longbeach.gov 562-570-4008	Michael Lyde mlyde@lyde-enterprises.com 310-809-6949
University of Massachusetts, Lowell, MA	MALHH0171-08	Healthy Homes for All: Improving Children's Health in Diverse Communities	09/2009-03/2012	David Turcotte	David Turcotte University of Massachusetts Lowell, Program Director at the Center for Community Research and Engagement 870 Broadway St. Suite 212 Lowell, MA 01854 David_Turcotte@uml.edu 978-934-4682	Emily Chaves Emily_vidrine@uml.edu 978-934-4778	Rebecca Gore rjgore@gmail.com 978-934-3276

Michigan Department of Community Health Healthy Homes Section HHU II, MI	MILHH 0163-08	Healthy Homes University II	11/2008-12/2011	Wesley Priem	Courtney Wisinski Healthy Homes, Program Manager PO Box 30195 201 Townsend, 4th FL Lansing, MI 48909 wisinskic@michigan.gov 517-335-8252	N/A	Courtney Wisinski wisinskic@michigan.gov 517-335-8252
University of Michigan (UM) and Saginaw County Department of Public Health (SCDPH), MI	MILHH 0161-08	Healthy Homes Project of Saginaw	12/2008-12/2011	Jerome Nriagu, PhD, DSc	Pamela L. Smith pamela@urbanregenerationllc.com 989-992-6353	N/A	Pamela L. Smith pamela@urbanregenerationllc.com 989-992-6353
City of Milwaukee Healthy Homes Demonstration Project, WI	WILH H0189-08	Milwaukee Healthy Homes Initiative	09/2009-04/2012	Lisa Lien	Richard Gaeta City of Milwaukee, Project Manager 841 N Broadway Room 118 Milwaukee, WI 53202 rgaeta@milwaukee.gov 414-286-5788	N/A	Richard Gaeta rgaeta@milwaukee.gov 414-286-5788

City of Minneapolis, MN	MNLHH0149-06	Environmental Action For Children's Health - A HUD Healthy Homes Demonstration Project	11/2006-10/2009	Lisa Smestad	Lisa Smestad Minneapolis Health Department, Manager of Lead and Healthy Homes 250 S 4th St, Room 414 Minneapolis, MN 55417 Lisa.smestad@minneapolismn.gov 612-673-3733	Eliza Schell Eliza.schell@minneapolismn.gov 612-673-2606	Eliza Schell Eliza.schell@minneapolismn.gov 612-673-2606
Montana State University Extension Tribal Healthy Homes, MT	MTLHH0183-08	The National Tribal Healthy Homes Assessment, Training & Technical Assistance Support Center	04/2009-04/2012	Michael P. Vogel	Barbara Allen MSU Extension - Housing & Environmental Health Program 102 Taylor Hall PO Box 173580 Bozeman, MT 59717-3580 blallen@montana.edu 406-994-3531	N/A	Barbara Allen blallen@montana.edu 406-994-3531
Multnomah County, OR	ORLHH0209-09	Multnomah County CAIR Program	05/2010-10/2013	Kim Tierney	Kim Tierney Multnomah County Health Department 847 SE 19th Ave, Suite 350 Portland, OR 97232 kim.h.tierney@multco.us 503-969-3309	Deborah (Rood) Costello Deborah.j.rood@multco.us 503-988-3674 *88859	Kim Tierney kim.h.tierney@multco.us 503-969-3309

National Center for Healthy Housing, MD	MDLHH0156-07	Making Low-Income Housing Rehab Green and Healthy	11/2007-06/2011	Jill Breysse	Dave Jacobs NCHH, Director of Research 10320 Little Patuxent Pkwy, #500 Columbia, MD 21044 djacobs@nchh.org 202-607-0938	Jill Breysse jbreysse@nchh.org 443-539-4155	Sherry Dixon sdixon@nchh.org 443-539-4156
National City, CA	CALHH0145-05	City of National City Healthy Homes Demonstration Project	11/2005-10/2009	Alfredo Ybarra	Bonifacio Salazar City of National, City/Housing Inspector 140 E. 12th St., Suite B National City, CA 91950 bsalazar@nationalcityca.gov 619-336-4216	N/A	Carlos Aguirre caguirre@nationalcityca.gov 619-336-4391
Pennsylvania Department of Health ARRA, PA	PALHH0170-08	Healthy Homes Program	04/2009-04/2012	Joseph McLaughlin	Todd Christophel PA Dept. of Health tochristop@pa.gov 717-772-2762	N/A	Todd Christophel tochristop@pa.gov 717-772-2762
City of Phoenix/Healthy Homes Demonstration Program (HHDP), AZ	AZLHH0173-08	Phoenix Healthy Homes Partnership/ Healthy Homes Demonstration Grant	04/2009-04/2012	Tim Boling	Laura Smith Neighborhood Services Department/Project, Manager 200 W. Washington St, 4th Floor Phoenix, AZ 85003 Laura.smith@phoenix.gov 602-534-2528	Bruce Nelson Bruce.nelson@phoenix.gov 602-262-6286	Laura Smith Laura.smith@phoenix.gov 602-534-2528

Self Help, Inc. Healthy Homes Demonstration Program – ARRA, MA	MALHH0175-08	Brockton Healthy Homes	04/2008-12/2011	John Eastman	Linda Barros Self Help Program Manager 780 W Main Street Avon, MA 02322 lbarros@selfhelpinc.org 508-588-4049	Carol Murray carolm@selfhelpinc.org 508-588-4049	Linda Barros lbarros@selfhelpinc.org 508-588-4049

APPENDIX 2: GRANTEE OBSERVATIONS

This appendix includes the verbatim text of grantee observations as noted in Chapters 3-7. Tables are referenced by the chapter and section to which they apply. Please note that misspellings were corrected, but grammar was not, for these observations.

CHAPTER 3: DATA MANAGEMENT AND QUALITY CONTROL

TABLE 3: A OTHER GRANTEE OBSERVATIONS ABOUT QUALITY CONTROL

Comments
An independent QA consultant was hired. All assessments and interview sheets were given to the consultant who collected data and prepared a final report at the end of the grant cycle. Evaluator and staff met as needed to provide and collect feedback on ongoing findings and provide feedback.
For data entry, data was/is entered into a database and verified through a QC sampling process.
File checks and database entry accuracy checks for 10% of projects.
Two visits were made by … who was responsible for QA/QC activities. She evaluated the files for completeness, accompanied inspectors and interviewers to households to watch the procedures to assure they matched the written protocols. All the interview questionnaire results were sent to NCHH for completeness. All the invoices, work orders, home energy audits and inspection notes were redacted of personal information and reviewed by NCHH for consistency and cost.
The process to validate data included data entry by two different staff (double entered) in separate entry files; … then runs a quality report identifying the discrepancies between the two data sets for each case. A discrepancy report was generated and staff follows up on each data discrepancy (identifying the correct rating and correcting the rating by indicating a final rating).
The program used the Juniper Questionnaire because it had already been validated.
Used questions from standardized interview assessment tools
We shadowed staff for visits, audited charts to compare interventions with supplies provided and change in outcomes, identified frequency of hazards assessed, [held] weekly case management meeting for entire team.
One person did all data entry; Validation check on all data entry.
… a BPI certified and Healthy Homes Specialist working for EHW, provided ongoing QA/QC visits during specification writing, construction, and at the time of clearance…. also conducted post construction follow up inspections on units that had been remediated > 6 months prior. Post remediation site visit were conducted on 25 houses. These units were randomly selected based upon the timing of the clearance and availability of the client. The selection process could best be described as the "selection of convenience" and doesn't reflect a statistically based selection process. As a result the findings may not be equally applied across the entire project but rather may anecdotally guide future interventions. All units at the baseline inspection had both a CCBH Sanitarian and Housing Inspector from either the Cleveland Housing Network or Cuyahoga County Dept. of Development present to conduct the home assessment.

CHAPTER 5: ASSESSMENTS AND INTERVENTIONS

TABLE 5.A: ADDITIONAL GRANTEE COMMENTS ON VISUAL ASSESSMENT TOOLS

Comments
The program used parts of the above listed checklists and pertinent parts of the Massachusetts Sanitary Code list
We adapted the assessment tool developed by the Seattle King County Healthy Homes project and also created our own tool.
Our tools were created in our first grant in 2004 before most of the tools listed above were developed. The format and data elements largely followed the Erie County Healthy Homes Program assessment tool from 2004. We looked at a few other tools used by programs at the time and selected data points that we thought would be useful to integrate into the assessment tool. The Cuyahoga/EHW tool is interesting and we adapted some from it, but is too lengthy and detailed to adapt much for a general healthy homes tool. We made some modifications for the 2008 grant but it largely remained the same and we continue to use it. We occasionally use the EPA Asthma Home Environmental Checklist occasionally for asthma specific one-time visits. We also recommend to our peers in other home visiting programs to adapt the PEHA tool although we do not use it ourselves.
Developed under prior HUD OHHLHC Healthy Homes grant. Derived from CEHRC Visual Assessment tool, still in use by this Department today.
We looked at a dozen or more tools and then adapted the questions to our housing stock, and what we could address within the resources of our grant. We also used a standardized symptom survey for the asthma, this was self-reported by the parents.
Weatherization audit form we developed over the years to capture all the information needed to make a cost effective decision for the weatherization interventions. The interview questionnaires were adapted from the CEHRC visual Assessment tool. Weatherization Pollution Source form
The Program worked with Dr. Sherry Dixon at the National Center for Healthy Housing to modify and develop a tool to examine 39 potential hazards on a room-by-room basis. The tool details specific structural hazards, safety hazards, lead hazards, and health hazards. Each potential hazard was rated as low, medium or high. Room by room data was used to create a summary score for each hazard for the entire housing unit. Data was gathered via three methods: visual determination; verbally-administered questionnaires; and testing/assessment instruments.
The program created a tool that borrowed from the best of the Baltimore Health Department's Healthy Homes Visual Inspection, Boston University's Pediatric Asthma-Allergy Home Assessment, the National Environmental Education and Training Foundation's tool, and the tools checked above.
In addition we developed tools to collect more detail information about the home environment, we used a tested tool which is the Asthma Control Test (ACT) a two week recall about asthma control, we used a Perceived Street Scale (PSS) another tested tool to measure mental health, and lastly we tested tool used to rate housekeeping in the home
The HHD Program helped significantly in the continued development of the GHHI Comprehensive Assessment Form and worked to field test, improve, and fine tune the Comprehensive Assessment Form used during the home

environmental assessments and energy audits. The home assessments provided the assessors with valuable, variable and unpredicted circumstances that had contributed to making the comprehensive assessment form more useful and adaptable to the different conditions presented during the inspection process for environmental assessors/energy auditors in Baltimore and other locations nationally. The Program believes that the GHHI Comprehensive Assessment Form has value as a tool for assessors, auditors, and inspector to comprehensively assess multiple home-based health hazards and weatherization and energy efficiency needs.
The Visual Assessment was administered by CCBH personnel at the time of the Environmental Visit 1 (EV1) which commenced upon the approval of the HWAP application. This in-depth nine page assessment form was completed at the time of the concurrent visit with HWAP personnel. Based upon this visit, and the information collected on the VAT, site specific specifications were then developed.
A user-friendly tool that allowed the inspector to write descriptions instead of check boxes.
Our program designed its own Remediation Prescription Checklist (RPC) to specifically identify which home hazards required immediate repairs. Because we had limited funds for repairs, we had to prioritize the repairs.
Before this grant was awarded, we had developed our own comprehensive, systematic, scored and rated visual assessment protocol and data collection instrument.

Comment
We did not have an electronic data collection, but transferred our written data to an access-based computer program
"We switched to paper midway through because of connectivity problems….a Windows Netbook was used in the field to record the visual inspections and interviews. It used cellular technology to connect to the EHW server where the database resided. After experiencing numerous problems with the cell connection and with the interface with the database on the server, we discontinued use of the Netbook for data collection in the field. Instead we used paper copies of the visual inspection and interview forms. Inspectors reported that the paper forms actually made the process of data recording easier (less time and frustration with the Internet connection) and more reliable (the paper forms provided verification for data entry quality control)."
We tried putting forms on cell phones and on a tablet computer, but the phone screens were too small and the tables were too big, so staff resorted to paper and pen for data collection.
Data collection was recorded on paper, then entered in a program data base and reported generated by Dr. Sherry Dixon of the National Center for Healthy Housing, under the direction of Phoenix Children's Hospital's Community Education and Assessment Coordinator.
We used netbooks to collect home visiting data.
A laptop computer was used in the field to conduct the resident education in the field. The laptop computer was connected to the internet using an internet card to provide access to the program's Social Solutions Efforts to Outcomes (ETO) client database that recorded all resident intervention and education information. This live data port access to the program's client database permitted real time data entry reduced the need for Environmental Health Educators to enter information in the client database upon their return to the office.
The collection tool for visual assessment was an inspection checklist similar to the Healthy Homes Assessment tool created by NEHA. Other than the assessment tool, our lead program performed risk assessment/inspections on all pre-1978 homes. Construction specs were created based on the lead hazards present.
"Overview of the CAIR database –

…The CAIR database was developed in 2010 through the Multnomah County Health Department's IT unit. It was originally adapted from a case management application developed for some of the social service divisions within Multnomah County, but the evolution of the database through the CAIR program was extensive and specific to Healthy Homes activities and HUD reporting needs, The three Healthy Homes program all had separate data systems. So this application incorporated aspects of the previous healthy Homes Access database and the AIR web based referral and reporting system with the needs of the CAIR program to provide one central point of referral into all three programs. …

The CAIR system is Web based and can be accessed by multiple team members in the field. Our team in CAIR included Community Health Workers, the Intake Specialist, the Environmental Health Specialist and a Community Health Nurse/Asthma Educator. With the advent of the CAIR program, our multidisciplinary teams needed to chart and track their activities, document visits, assign tasks to other team members and we needed to gather information needed for reporting in real time. We continued to use charts, primarily for the nurse on the team. At the close of the case we would print up a printer friendly version of the chart and put it in the file….

Description of the system:

* Intake collects address and residence status information, confirms income (MFI & FPL) connects to the GIS system to get other information including latitude, longitude, age of home, type of housing, Environmental review issues, household member information, DOB and database calculates age, provider information, (ability to add multiple providers and contact info), Health Insurance for client, # numbers)

* Ability to assign tasks and assign case management. Intake specialist assigns cases to Case Manager (CHW), Nurse, or EHS by selecting a task, Staff person gets an email when case gets assigned. Case management reports can be run to identify who is on the case load and manage the caseload

* Ability to assign tasks to self or other members of the team - Can assign each other tasks, with due dates and status (like a follow up task that client needs a dehumidifier, etc.). Task reports can be run by staff member, due date, task type etc.

* Household tab - parental/guardian info, contains names, dob and ages for all household members, insurance information, language , need for interpreter

* Residence tab- Section includes residence info, initial address, additional addresses can be added and current address is marked, for each address there are fields for # rooms, square footage, age of home, renter/owner/boarder, type of dwelling

* Visit tab- the database visit tab has multiple types of visits (Environmental Assessment - Initial and Final, Intervention, Physical Remediation visit, Nursing Visit, Home Repair visit) Each visit type contains different information that we collect and report out on. The visit tab will show all visits and status by all team members.

- Environmental Assessment visit collects information pre and post on Healthy Homes/IAQ issues including ETS, Dust and dust mites, Animal Dander, Household Chemicals, Pests and Rodents, Mold. These scores are assessed by checking where they rank on a scale. Each section has a subtotal and there is a total score given for all 3 sections. The Hazard section analyzes lead, CO, Radon, and other VOC. the level is assessed and marked. If it is above normal ranges, the level is noted and score is given. The safety section identifies safety and housing code issues. Points are also assessed for every item checked. Also 5 questions are asked to measure clients' perceptions, household members' visits to ER, relationship with landlord, access to medical care. There are note sections following each sections to chart a narrative of what was seen

- Nursing visit measures ER visits per client, and ACT/TRACK scores

- Intervention visits include all interventions listed as factors on the Env. Assessment and other factors identified by the HHRS. There is also a note box

- Physical Remediation visit is basically a complete housing inspection (internal and external) that could be also used for inspections by the code enforcement housing inspector.

- Home Repair captures some HUD specific information needed for QPRS - like where the work was done etc. * Supplies tab - This tab identifies what items and costs were issued for specific dates. A separate report can identify what was given per household and at multiple addresses, total amount of supplies given, etc. This report also can be run by date or program to identify how much of which items were issued in a specific time period (for inventory and ordering) * The Notes section is for progress notes. It can be open for 48 hours and will automatically auto sign and close afterwards. Notes are date stamped and cannot be altered after signed/closed. Notes can be sorted by type. Notes auto save every several minutes to save work in case interconnectivity is lost while charting. * Community Referral Tab - Referrals to other agencies are noted on this tab. Tab also includes status of the referral and total amount/costs of services provided. * Data base allows us to upload pictures, files and scanned documents (such are WX applications, etc.). * Data base links the individual case to other clients at the same address. DB duplicates information from all Environmental visits and supplies for each household member. It doesn't duplicate Nursing visits or progress notes. * The system has the capability to run a large number of reports and queries - both SQL and SSRS, aggregate and individual.
Paper based tools with data entry person entering data into an Access database that housed all documents.
Computer Assisted Telephone Survey (CATI) was created and administered to interview adult household response regarding demographic, housing conditions and health information pertaining to household members including children. This included an extensive list of housing conditions.

TABLE 5.B: GRANTEE RESPONSES AS TO ADDITIONAL DATA COLLECTED DURING CLIENT INTERVIEWS

Responses
Medication management issues. Did the children need additional medical supplies provided by insurance? If so, our respiratory therapists obtained those items often during the baseline and initial follow-up visit and provided those by billing insurance companies.
Is the home in a certain geographical location? We did our study in a school district so the household had to be within the boundaries of that school district and also not in a flood plain. I checked the baseline interview because we ask this question to determine qualification for the study. Once we know there is no follow-up question regarding the geographical location of their home.
Pests, pesticide use, space heater, plumbing leak, roof leak, flooding.
At pre and post assessments, families were asked 5 questions to measure clients perceptions about if housing was making them sick, evaluating the health of their family, # of household members visits to ER, relationship with landlord, access to medical care. Children with asthma and seen by the nurse were interviewed about asthma, knowledge, symptoms, ER utilization and doctor visits during every nurse visit. Behavioral information, need for services, was gathered more informally and documented in notes at most visits.
Pests, comfort and safety, mental health, neighborhood safety, noise.
We obtained the age of housing through town's assessors. Most residents and homeowners did not know this information accurately.
EBLs are only conducted when referred to Lead Hazard Control.

Asthma control, child asthma short form for daytime, nighttime symptoms and functional limitations.
Neighborhood observations were completed following the initial interview for each household.
Symptom and exposure surveys – For basic assessment: symptom and exposure surveys at baseline only. For advanced assessment: attempted to gather symptom and exposure surveys at baseline and follow-up. Very difficult to get. Only 66 ended up providing this information.

CHAPTER 6: OUTCOMES

TABLE 6.A: GRANTEE NARRATIVES ON ASTHMA OUTCOMES

Responses
Community Health Survey for Asthma scores improved significantly from the baseline to the final assessment. Child physical health, child activity, child emotional health, family activity, and family emotional health scores were based on responses to multiple questions. Child physical health improved from 66.8 to 89.3, child activity improved from 84.9 to 93, child emotional health improved from 67.9 to 88, family activity improved from 88.7 to 97.4, and family emotional health improved from 71.2 to 81.1. All scores were on a 100 point scale.
Outcome 3: Reduce by 80% the frequency of children's asthma symptoms and unintentional injuries. Section 2: Questions 23, 24, 25, and 26 of the Baseline and Six Month Questionnaires served as the elements for measuring the frequency of the child's asthma symptoms… The table below presents the mean number of days/nights the child experienced asthma-related symptoms at baseline and at six month follow up. It is especially encouraging that for each of these symptoms, the mean numbers decreased statistically significantly from baseline to six month follow up. Item Baseline Mean Follow up Mean Significantly Different 23. During the day in the last 14 days, how many days did [child] have asthma symptoms? 5.02(0-14) 2.59 (0-14) Yes 24. During the night in the last 14 nights, how many nights did [child] wake up because of asthma symptoms? 3.26 (0-14) 1.27 (0-14) Yes 25. In the last 14 days, how many days did [child] have to slow down or stop his/her play such as running, riding a bike, or playing outside and/or sports activities such as playing ball or swimming because of asthma? 3.98 (0-14) 1.63 (0-14) Yes 26. Except for prescribed use before exercise, in the past 14 days and nights, how many times did [child] use his/her quick relief medication, such as a rescue inhaler or nebulizer with albuterol? 4.68 (0-14) 2.03 (0-14) Yes Seventy-nine of 99 participants' children had a reduction in their asthmatic episodes (79.8%; this information was not completed for 21 participants).

Outcome 5: Reduce the number of children's hospitalizations and emergency room visits by 80%.

Three items were used to measure this objective: In the last three months, because of his/her asthma, how many times did [child]: (a) Go to the emergency room or urgent care center, (b) Was admitted to the hospital overnight, and (c) Have to be seen by a doctor when no advanced, regular appointment had been scheduled. Participants were able to freely respond and numbers were recorded.

Visits to emergency rooms decreased from baseline and follow up for these participants' children, as 53 children went to the emergency room at baseline and 29 did at six month follow up (a reduction of 83%). The mean number of visits at baseline was 1.12 and the mean number of visits at follow up .48.

Eight participants at baseline reported having their child admitted to the hospital overnight (mean number of nights child stayed overnight in hospital = .16 nights), and four of the participants reported this at six month follow up (.08 nights); a 100% (this should be 50% for hospitalization) reduction. At baseline, the mean number of times a child was seen by a doctor when no advanced regular appointment was scheduled was .89 and at follow up was .52. Fifty participants reported having their child seen by a doctor at an unscheduled visit at baseline and 31 reported this at six month follow up (a 61% reduction).

Outcome 2: Increase by 60% the frequency and application of hazard control and prevention practices by the primary caregiver.

This section asked participants to indicate the frequency with which they manage asthma triggers and irritants. Some of the items also related to injury prevention. Responses were provided using a six point Likert-type scale, ranging from Five or More Times (5) to Not at All (0). Does not apply was also an option, but was omitted from calculation; therefore, the higher the number, the more often the activity was performed. The table below presents each item, the mean response, and the range of responses. The highlighted item at follow up indicates a statistically significant difference in the item from baseline to follow up. Given the small sample size, it is not surprising other items were not statistically significant; however, the direction of change is in the desired direction and future analysis with a larger sample may elicit statistically significant results.

Item Baseline Mean Follow up Mean Significantly Different:

a. Vacuum child's sleeping room 2.77 3.55 Yes

b, Vacuum entire house other than child's sleeping room 3.30 3.85 Yes
c. Put clean sheets on child's bed 2.37 2.82 Yes
d. Use a HEPA vacuum cleaner .50 3.92 Yes
e. Vacuum upholstered furniture 1.04 2.16 Yes
f. Dust in child's sleeping room 1.93 2.67 Yes
g. Dust entire house other than child's sleeping room 1.97 2.73 Yes
h. Use candles or incense 1.73 .75 Yes
I. Use vinegar and baking soda or another non-toxic method to clean the house .82 3.83 Yes
j. Wash child's stuffed animals .65 1.00 No
k. Clean drapes, curtains, and blinds .68 1.38 Yes
l. Mop bare floors 3.61 3.60 No
m. Treat home for roaches .23 .32 No
n. Check smoke detector batteries 1.78 2.21 Yes
o. Practice fire drills .45 1.23 Yes

Using these 15 items to determine whether this objective was met, 94 of the 120 participants (78%) increased their frequency of asthma management activities from baseline to follow up.

Participants were also asked if there were allergen-proof covers for each of the following items. Yes or No responses were allowed and the frequency of Yes responses are presented in the table below.

Section 3: Caregiver Quality of Life

Nine items were asked of participants about their quality of life. For each item, participants could respond using a five point Likert-type scale, ranging from All of the Time (1) to None of the Time (4), with the fifth response being Don't Know/Refuse (5). For these items, higher scores reflected a better quality of life. The following table presents each of the items and the mean response. The means presented do not include those who responded, Don't Know/Refuse, Highlighted cells indicate a statistically significant difference from baseline to follow up.

Item	Baseline	Follow up
1. I felt helpless or frightened when [child] experienced coughing, wheezing, or breathlessness because of his/her asthma.	1.88	1.32
2. I felt frustrated or impatient when [child] was irritable due to asthma.	1.66	1.31
3. [Child's] asthma caused me to miss work.	1.18	1.18
4. I was awakened during the night because of [child's] asthma.	1.97	1.58
5. I worried about [child's] ability to have a normal life because of the asthma.	1.95	1.43
6. I worried about my child's medication and their side effects.	2.09	1.62
7. I worried that family finances were hurt because of [child's] asthma.	1.42	1.26
8. Asthma attacks made me fear for my child's life.	1.84	1.52
9. I felt angry that [child] has asthma.	1.38	1.19

Section 6: Program Adherence

A few items asked participants at follow up, the extent to which their child's symptoms had improved, whether they used the recommendations provided to them for trigger management, and if they used the cleaning products that were recommended. The following presents those results.

Item	Yes	No	NA/Unsure
Have [child's] symptoms improved since you began the program?	111 (89.5%)	9 (7.3%)	4 (3.2%)
Do you follow the trigger management recommendations in the healthy homes action plan we provided you?	120 (96.8%)	2 (1.6%)	2 (1.6%)
Have you purchased and continued to use the cleaning and household products we recommended in the healthy homes action plan?	117 (94.4%)	5 (4.0%)	2 (1.6%)

For those participants who reported their child's symptoms had improved since they began the program, they were asked to explain how they have improved. Some responses were:

- Air quality of the house is cleaner
- Asthma has been a lot better; no issues at doctor's appointment

- Breathing is better especially since HEPA vacuum is being used
- By learning to clean properly I was able to eliminate asthma triggers in the home
- Decrease in asthma attacks
- Discontinuing candles and fragranced chemicals; helped reduce asthma triggers
- Does not wheeze as much as used to; no trouble this winter like she usually does
- Doesn't wake up with stuffy nose, trouble breathing
- Dusting and vacuuming room has lessened frequency of asthma exacerbation
- Fewer flare-ups; we know better what to do to control triggers
- Fewer symptoms since moved
- Fragranced sprays have been discontinued in the home which has helped reduce symptoms
- Go outside and play more w/o exacerbation; child walks to bus stop w/o SOB
- Has not had any asthma symptom since program began
- Hasn't had any symptoms in last 3-4 months
- Hasn't had as many attacks since I've learned how to be safer with cleaning supplies I use
- Hasn't had to be on steroids; no hospital stays
- Having less symptoms of asthma
- He coughs less and is able to tell me if something hurts/
- He has been healthier. Doctor discontinued albuterol because he has not been having symptoms.
- He has been taken off Flovent. Stopped using candles and incense and has made a big difference.
- He hasn't wheezed a lot since I've not been smoking and I've been cleaning and dusting.
- He is having a lot less symptoms. It's amazing how knowing about reducing triggers makes a difference.
- He is having less symptoms since the program began
- He is not having asthma attacks as much.
- He is not sneezing and wheezing as much and he has decreased his smoking.
- He used to have asthma attacks all the time now he doesn't because now I have what I need to know to clean up and stuff like that
- He's doing very well. Fewer asthma symptoms
- Helped parent learn what to do and not do regarding child's health"

Asthmatic Children-

Clinical Outcomes- Project patients (n = 29):

Compared hospitalizations for the year prior to home visit to the year after the visit

Previous Year: # annual rate

Hosp 50 1.85

PICU 19 0.38

30 d Re-Admit 6 0.12

Year after home visit: % decrease

Hosp 20 0.76 58.6%

PICU 6 0.30 67.4% 30 d Re-Admit 0 0.0 100%
Data from 397 families (548 children) was included in statistical analyses of health care services, school days missed, and asthma symptom burden. Although there were 3-month and 12-month data collection points, the most appropriate comparison was the baseline and 12-month data because of the seasonal aspects of the asthma symptom experience. Statistically significant (matched pairs t-test, two-tailed, $p < 0.05$) reductions in hospitalizations, emergency department visits, unanticipated clinic visits for asthma and use of oral systemic corticosteroids for exacerbations were found. These results indicate a lower demand for health care services due to uncontrolled asthma. While a reduction in school days missed was noted, the difference was not statistically significant.
Caregivers: Pediatric Asthma Caregiver's Quality of Life Questionnaire. This questionnaire was administered pre and post interventions. There are 7 degrees of responses to 13 questions pre intervention and 7 degrees of responses to 18 questions post interventions. The responses range from "all of the time" to "none of the time". Statistical significance: "Moreover, the study group's improvement in caregivers' quality of life exceeded that observed for comparison group caregivers ($P = .002$) by 0.7 units, a clinically important difference."
There were 306 children enrolled in the Healthy Homes Program. Of the 306 children enrolled 138 (45%) had a current or previous diagnosis of asthma. Forty-six (33%) of the 138 patients with asthma were referred to the Healthy Homes program by the Breathmobile. Of the 168 children screened for asthma that did not have a previous diagnosis, 9 (5%) scored "highly suspicious" of asthma with an asthma screening score of 3 or greater. Eight of those children were referred to the Breathmobile for treatment. Both baseline and follow-up data had to be available for inclusion in the analysis. There were 42 children that met this criteria (10 referred to Breathmobile by the HHDP and 32 existing Breathmobile patients). Outcomes measures analyzed include: disease severity/control, Forced Expiratory Volume in 1 second (FEV1), missed school days, Emergency Department Visits, and Hospital Visits.
Self-report of asthma severity in children decreased from a mean rating of 6.33 to 3.83. These ratings are on a scale from 1 to 10 with 1 meaning low asthma severity and 10 high.
The participants enrolled in the study all showed significant health improvements. Participants had high levels of Emergency Department visits and hospitalizations at the baseline visit, but their asthma improved significantly during follow-up visits. Also Asthma Action Plans increased over 45% from baseline to follow-up.
Pre intervention baseline health surveys that were conducted and used a time from of 6 months prior to baseline survey as time period for self-reported health assessment by client. Post intervention health surveys conducted at 6 months post intervention. A Health Assessment Survey was developed to assess the severity of asthma conditions pre intervention and any improvements in asthma conditions post intervention including reductions in asthma episodes. Nursing and School of Public Health students from Johns Hopkins University administered the pre intervention Health Assessment Survey to all program participants as well as post health assessments 6 months following the intervention. The Health Assessment Survey was modeled from the American Academy of Pediatrics' Children's Health Survey for Asthma (CHSA). …. Key health outcomes observed from the completion of pre and post intervention client health assessment surveys include:

- 88% increase in participants reporting that their child didn't have to work harder to breathe
- 60% reduction in total number of asthma related client hospitalizations in participant pool post intervention
- 50% increase in participants reporting never having to visit the doctor's office due to asthma episodes
- 55% increase in participants reporting their child's asthma as well controlled
- 62% increase in participants reporting asthma-related perfect attendance for their child (0 school absences due to asthma episodes)
- 88% increase in participants reporting never having to miss a day of work due to their child's asthma episodes.

The mean number of days between ACT pre-intervention survey administration and post-intervention survey administration was 361 days (median = 316 days), while the minimum time was 112 days and the maximum time was 842 days. There were statistically significant improvements (p value <.05) in asthma control between the pretest and posttest for all five questions asked in the survey.

Health Care Utilization

The mean number of days between HCU pre-intervention survey administration and post-intervention survey administration was 357 days (median = 306 days), while the minimum time was 112 days and the maximum time was 826 days.

The mean number of days between clearance and the post intervention survey was 242 days (median = 161 days) with a minimum of 72 days and a maximum of 735. The HCU was designed to capture information from the previous three months. Administering this tool three months post intervention would theoretically afford the best opportunity to capture the impact of the remediation.

There were statistically significant improvements (p value <.05) in health care utilization between the pretest and posttest for three of the four questions asked in the survey, with no significant difference indicated by overnight hospitalizations with this sample distribution. This may be due to the fact that children were not reported as having been hospitalized in the initial, nor in the subsequent administration of the HCU; thereby resulting in a high number of "no changes". Only 2 out of 47 cases initially reported hospitalizations. This may be reflective of the severity of asthmatic children that enrolled in the program. Certain information was obtained at different intervals in the program - allergies/asthma/respiratory conditions as well as concerns r/t housing conditions were obtained in the determination of eligibility process. Pre-intervention and post-intervention surveys were administered to the primary caregiver of the child with asthma. There were 47 pairs of data available for both the Asthma Control Test Survey (ACT) and Health Care Utilization Survey (HCU). In order to perform the statistical test, the difference between the pre and post-intervention surveys was calculated (post-intervention minus pre-intervention) for each child resulting in negative values representing a decrease in the number of times the child needed to access a health care provider or had symptoms while positive values represent an increase in the frequency of symptoms. The Wilcoxon Signed-Rank test was used to test for a significant change in measurements after the intervention as survey responses was not near a normal distribution. Asthma Control Test The mean number of days between ACT pre-intervention survey administration and post-intervention survey administration was 361 days (median = 316 days), while the minimum time was 112 days and the maximum time was 842 days. There were statistically significant improvements (p value <.05) in asthma control between the pretest and posttest for all five questions asked in the survey. Clinical Chronic Obstructive Pulmonary Disease & Medicare Health Outcomes Survey Methodology Pre-intervention and post-intervention surveys were administered to seniors > 65 years of age. There were 16 pairs of data available for the Clinical Chronic Obstructive Pulmonary Disease (COPD) Questionnaire and 17 pairs of data available for the Medicare Health Outcomes (MHO) survey. In order to perform the statistical test, the difference between the pre and post-intervention surveys was calculated (post-intervention minus pre-intervention) for each senior resulting in negative values representing a decrease in the number of times a person

had the symptom or control, while positive values represent an increase in the frequency of symptoms. The Wilcoxon Signed-Rank test was used to test for a significant change in measurements after the intervention as survey responses was not near a normal distribution. In administering these tools, it was apparent that there were multiple factors impacting our clients beyond their chronic respiratory healthy condition including mental health, social and economic factors. Clinical Chronic Obstructive Pulmonary Disease The mean number of days between COPD pre-intervention survey administration and post-intervention survey administration was 350 days (median = 342 days), while the minimum time was 119 days and the maximum time was 712 days. There were statistically significant improvements (p value <.05) in COPD control between the pretest and posttest for persons reporting "short of breath doing physical activities" and "concerned about getting a cold or breathing getting worse".
We used the Asthma Control Test to evaluate asthma status and gather information about Days with worsening asthma, Nighttime symptoms, Use of rescue inhaler, and Limitations on usual activity. We collected information about medication use but not in a format that we could easily extract. Our time period was in the last 6 months at baseline and in last 6 months at final visit (6 month+ case management program)
Clients in Intensive group were less likely than Standard group to miss school days due to asthma symptoms. 91% of clients in Intensive group reported good control of asthma symptoms.

TABLE 6.B: GRANTEE OBSERVATIONS ABOUT INJURY PREVENTION OUTCOMES

Responses
Childproofing was typically part of our injury prevention for pediatric clients and part of the assessment that also covered our 65+ clients. We received excellent post assessment outcome for both pediatric and geriatric populations. We had prevention in mind for pediatric clients, while we heavily worked on injury reduction for geriatric by removing area rugs, old wall to wall rugs, installation of railings, etc. The results were statistically significant after intervention.
Unintentional injuries in which the child required medical attention reduced by 30%; from 13 persons at baseline to 10 at follow up. The percentage of children having a poisoning incident at home which required medical attention or a call to the Poison Control Center reduced from seven at baseline to four at follow up, a reduction of 75%.
There was an 8.6% reduction in the number of injury-related ED visits and hospitalization pre-invention (N=58) to post-intervention (N=53).There was a 3.6% reduction in injury-related ED visits from pre-intervention (N=55) to post interventions (N=53).
For seniors, a post project survey was used to track number of falls since completion of the intervention. 98% of respondents reported using items provided during the intervention and that they felt safer in their homes. A small number of interventions were also completed for child safety if hazards were identified during the course of the environmental assessment. These interventions primarily involved supplies such as baby gates or in cases of co-sleeping a bed for the infant.
Pre and 6 months post intervention health surveys were conducted including questions regarding household injury prevention.
We experienced improvements in reduction of injury prior to the program interventions and saw no changes within the pre and post assessment period.

No significant change in percent of people reporting injuries between baseline and one year post-renovation. For senior clients, survey had questions on falls pre/post remediation utilizing the Medicaid Health Outcomes Survey. This was a limited number of the total cases (N= 27).
Staff at Phoenix Children's Hospital (PCH) monitored and evaluated responses submitted from the Self-Assessment Survey Tool and Home Safety Pre and Post-tests provided to families enrolled in the HHDP and at various education training sessions. During the grant period, a home safety self-assessment survey was given to 99 families prior to a home assessment visit by the HHDP Home Assessor and the Health Educator. The following information represents the responses given about the most prominent safety hazards found in homes. Fire and Burn Home Hazards Sixty-eight percent (68%) of respondents have one or more windows that are broken or unable to be opened, creating a potential fire egress hazard in case of a fire emergency. Having a working smoke detector in the home reduces instances of fatality due to home fires by 50%. It is the number one way to reduce fire related fatalities. Forty-eight percent (48%) of respondents do not have a working smoke alarm installed in the home, or do not know if the smoke alarm works in the home, as it had never been tested nor sounded an alarm. In addition, 74% of respondents do not follow the recommendation to test the smoke alarm once a month, with 56% having never tested the alarm or there is no alarm installed in the home. Fifty-five percent (55%) of respondents indicated that the smoke alarm is mounted in an inappropriate place in their home, increasing the risk of false alarms and subsequently increasing the likelihood of removing the batteries. In addition, 38% of respondents have a smoke detector in the home that is less than 10 years old. The remaining 62% either do not have a smoke alarm, do not know the age of the smoke alarm, or know that the smoke alarm is more than 10 years old. Current recommendations are to replace smoke alarms after 10 years, as there is no guarantee they will function properly in a fire after the indicated lifespan. Fires in the home can become fatal in two-three minutes, thus it is important that all families know how to quickly exit a home in case of fire. Seventy-five percent (75%) of respondents indicate that they do not have an escape plan in case of fire and 90% have never practiced an escape plan with their children. Only 3% indicated that they have practiced a fire escape plan with their children twice a year as per recommendations. Out of 89 respondents, 6% have space heaters that are placed less than a foot away from flammable materials. Nineteen percent (19%) keep space heaters the appropriate distance from flammable materials and 75% do not use space heaters. Scalds/Burn Hazards Ninety-four percent (94%), or 81 out of 87 respondents did not know the temperature of the water in the home, presenting a potential risk that the water temperature exceeds the recommended 120 degrees. Temperatures exceeding 120 degrees can pose substantial burn risks to young children. Fall/Safety Hazards Eight percent (8%) of respondents reported that they have rugs in the home that slip easily, presenting a risk for falls by children and the elderly. Sixty-nine percent (69%) of respondents indicated that there is heavy furniture present in homes with children less than three (3) years of age. Of those, 9% indicated that at least one piece of heavy furniture moves or tips easily, presenting a risk for injury. Fifteen percent (15%) indicated that at least one piece of heavy furniture is strapped to a wall to secure it and prevent it from tipping over. Infant Safe Sleep Twenty-one percent (21%) of respondents indicated that infants less than 12 months of age in the home had items in a child's crib that could present a safe sleep hazard. Less than 2% of respondents indicated that a child less than 12 months of age does not sleep in a crib, but rather sleeps in bed with the parent(s). Poisoning Hazards in the Home Fifty-nine percent (59%) of respondents living in a home with gas appliances do not have a working carbon monoxide detector in the home. Eighty- six percent (86%) of families with children less than eight years of age indicated that vitamins were locked or stored out of reach. Eighty-nine percent (89%) reported that medicines were locked or stored out of reach. Forty-five percent (45%) reported that cleaning products were locked or stored out of reach. A concern was raised because 55% of parents reported unsafe storage of cleaning liquids. General Safety Seventy percent (70%) of respondents did not have a first aid kit in their home. Home Safety Pre and Post Test From October 2009 through May 2011, the Phoenix Children's Injury Prevention Safety Specialist presented community home safety classes to 996 participants. The classes were presented to groups of parents at various organizations and training sites in central Phoenix. Not every participant took both the pre-test and post-test. If they arrived late to the class or left early they did not have the opportunity

to take both the pre-test and post-test. The following results are a measure of the total number of participants compared to the number of participants who increased their safety knowledge. An increase in their safety knowledge was measured by the number of participants who increased their knowledge from the pre-test to the post-test. There were 996 class participants and 456 class participants who demonstrated an increase in knowledge (i.e., increase in the correct number of answers on the test). Overall 46% of learners increased their safety knowledge. The last question on the post-test asked the respondent to identify two things that would increase safety awareness in their home. Analysis of the written comments and a random sample of post-tests reviewed indicated that thirty-three percent (33%) of responses would complete and practice a fire/emergency escape plan; 24% would check their smoke detectors monthly to make sure they were working; and 21% would put their cleaning supplies and medicines in a safer place where children could not reach them. Other responses included increased parental supervision, removal of potential choking hazards, installing electric outlet covers, and emptying and storing water-filled buckets upside down. Parents indicated they would include these actions in an effort to change and improve safety practices in their home.

TABLE 6.C: GRANTEE OBSERVATIONS ABOUT OTHER HEALTH OUTCOMES

Responses
The BMI data revealed a need to reinforce nutrition information and tips for healthy eating and exercise in the client curriculum. 5% of the children are underweight, 49% have normal Body Mass Indexes, 46% are either overweight or obese (of those that fall into the overweight or obese group, 52% are female and 42% male).
For trainings we conducted for inspectors, landlords, and housing staff we tracked participants knowledge pre and post and they all reported having confidence in speaking about the healthy housing issues (lead, IPM, Smoking free housing and other safety issues) to residents. We also tracked responses based on the likelihood that these stakeholders will implement or take action around healthy homes practices and responses were positive, and the majority of participants responded they will take action around the healthy housing issues.
The percentage of children reported as not well behaved improved from 33% to 8%, and those reported to have poor attention spans decreased from 67% to 33%, although neither change was statistically significant. Adult mental health did not change significantly.
For senior clients questions regarding overall health and wellbeing pre/post remediation We utilized the Clinical COPD Thys Van der Molen (N=16) and the Medicaid Health Outcomes Survey (N=17). The sample size was too small to be significantly significant.
With our younger population we also paid closed attention to individuals with severe allergies and after some behavior changes and medical intervention we saw significant positive outcomes. For the older population we had some individuals who smoked, who had COPD and emphysema and used oxygen. Going around the house and removing environmental triggers and addressing some minor structural deficiencies such as stabilizing paint in old units to prevent cement, wood or sheet rock decay improved their health condition and life style. For individuals with skin conditions, such as eczema, changing laundry detergents and other chemically/scented treated drying sheets and laundry boosters showed a significant positive outcome. Overall attention to our clients and helping them to address other critical issues in their lives by referring them to other programs improved their overall health, such as high blood pressure, depression, and stress. These were not documented in the published program final report, but were anecdotal data provided by our clients.
General health symptom frequency, inhalant allergy symptoms, and quality of life. Although these healthy outcomes were included in our grant program activity, we are still working to analyze the findings from the program research. We hope to complete this work before the end of this year.

"Participants were asked to rate the child's health using a scale of Poor (1) to Excellent (5). More specifically, the question (Question 36) was: In general, how is [child's] overall health? At baseline, the mean response was 3.29 or Good and at follow up the mean response was 3.72 or Very Good; this represents a statistically significant improvement from baseline to follow up ($t(1,114) = -4.49$, $p < .001$). Ninety-eight of the participants' children's health remained the same or improved from baseline to follow up (85.2%).

Participants also rated their own health using a five point Likert-type scale ranging from Poor (1) to Excellent (5). The question (Question 63; 55) posed was: How would you rate your own health? Baseline and six month follow up mean responses were approximately the same at 3.12 and 3.45 or Mean; this represents a statistically significant improvement from baseline to follow up ($t(1,111) = -2.76$, $p = .007$). For these participants, 92 people reported an improvement or their health remained the same over the six month period (82.1%).

CHAPTER 7: LESSONS LEARNED AND SUSATINABILITY

TABLE 7.A: OBSERVATIONS ON HOW TO OVERCOME CHALLENGES IN RECRUITMENT, ENROLLMENT, AND RETENTION

Responses
Recruitment is always difficult especially because the families we target are low-income and they have multiple priorities that make it even more challenging. Low-income families are more mobile and they change their telephone numbers often. We were successful in retaining families by dividing up incentives between visits and also making sure we made every possible effort to stay in contact with them by sending multiple letters to the home, door knocking and contact their health provider as well so we can maintain contact with the families. Using community organizations, health providers, and partner organizations were all successful recruitment strategies.
Our major success in recruitment was the fact we had staff the clients could identify with, we spoke their language, we translated materials in a very low literacy level, provided great incentives and followed up, even for things not related to healthy homes interventions. We connected the families with whatever their needs were. That way they were the ones who 'advertised' our program, because they felt we truly covered their needs. Word of mouth is the best, safest, and sustainable recruitment and enrollment strategy…We were successful at gaining families' trust and buy-in and we attributed [this] to the word of mouth communication system. Also, being able to speak to our clients in their own languages and having the knowledge of their culture was very important in order to make them feel comfortable and know we were non-judgmental. Overall our clients felt validated when we acknowledged the needs and extended ourselves to be willing to help them with non-program related unmet needs… To be as personable as possible; to be non-judgmental, to be able to identify with their world and to show true compassion. Listening is very important and showing that we are at ease in a family's home made us accepted. Being able to be creative on how to help a client with an unrelated issue is priceless. Engaging with children and seniors and using some humor is very helpful when appropriate…At first we tried door to door outreach that showed to be ineffective, because people fear someone knocking; some neighborhoods are not safe; people may be defensive or under documented, etc. It's always best to be introduced.

Involvement of physicians-in-training who were the client's physician; site-specific, moderate level interventions; hands-on education and involvement of occupants particularly throughout the assessment process; partnership between academic medical system and community-based housing and health organization…Largest challenge was landlord cooperation; attempted to overcome, frequently unsuccessfully, by education. Their concern was code compliance and scrutiny by an outside agency. Overcame this to some extent by developing moderate level interventions not requiring landlord cooperation.
We had a lot more people referred to us than the number we were able to contact and enroll in the program. Even after enrollment, we were unable to contact clients and had to close cases. Our clients tended to be below 30 % MFI and their cell phones were often turned off or only functioned intermittently, sometimes the numbers changed. This problem of contacting and enrolling clients has become much more problematic since 2008 and the downturn in the economy. We did find that when we tried to text clients that we had better luck reaching them. I would strongly encourage programs to schedule the initial appointments as soon as possible to the referral… We had difficulty meeting timelines - this was due to large numbers of clients coming in to the program in the beginning and we spent more time and visits that planned. Also our physical home repair and weatherization partners took longer to do the work that we had predicted. Ultimately we asked for and received a 6 month no cost extension. We had a bilingual Healthy Homes team and used interpreters as needed for languages other than English and Spanish. We tried to work with each family to identify if they had a lease or a month to month contract. If they had a lease we tried to identify if they were in good standing with the landlord. We offered to fund or help fund the housing repairs which did help with landlord compliance. But if families were at risk of eviction we were more limited to do physical repairs. We could always use more money to do home repair. Especially true for mobile home… The CAIR Healthy Homes Demonstration Grant was very different from the Lead Hazard Control Program and many of the Healthy Homes programs. In our program the households stayed in the program four to nine months. Almost one-fifth (60) households moved to another address during the case management and that presented additional challenges. Clients were more likely to disappear from the program and we were often challenged to keep in contact with them. We often did work at multiple addresses. There was no way to reflect this additional work in QPRS. Because we were instructed to report on the last address, we had concerns that HUD was getting the most accurate housing data… One of the biggest challenges we faced was keeping in contact with our clients. Because clients were enrolled in our program for an average of eight months we often lost contact with them. Out of the 312 clients who completed the program 60 of them, 20% moved during the time they were enrolled. Because we were serving the very low income, it was often difficult to reach clients on the phone, because their phones went in and out of service, depending on whether they had money to pay their bills. We did find that we had more success with texting clients that phoning them. Once we were established with the client, they were more likely to stay in the program. Front loading visits might help to reduce this issue…
Recruitment occurred after eligibility was screened for each client. It's easier for Public Health to screen for eligibility for their ongoing research programs because the income eligibility is higher and they screen verbally over the phone in the language of the potential candidate family. Typically, the phone screening for Public Health research is all that is necessary to screen families for eligibility. For the research process with this HUD project, the subset families that we needed had to be lower income that is typical for Public Health, had to have the need for a weatherization repair, had to be able to gain contact with the owner of the property for work authorization and had to complete necessary paperwork to apply for the KCHA weatherization program services. Necessary paperwork was cumbersome for families, especially undocumented families who may not have had three months'

worth of income verification in the form of check stubs. In these cases, employer letters were sought. While the HCHH King County Housing Authority collaborative program launch trained Public Health staff about weatherization repair work and what to look for to deem any individual family as eligible, families were not familiar with what the repair need might look like and were confused trying to figure it out over the phone with the recruitment screener. To mitigate the confusion we instituted a process whereby Public Health staff would conduct phone recruitment in the candidate family's language regarding income, severity of asthma and other factors, and Public Health staff would act as recruitment screeners using a Pre-Repair Worksheet tool to check off needed repairs they would ask candidate families about over the phone to determine eligibility. Often times families had difficulties identifying the repair, so recruitment screeners would set a brief appointment in the family's home to identify needed weatherization repairs, this was called the "in-home Pre-Enrollment Visit" and screeners would ensure that families' could access the owner for work authorization. Once this step was completed then the recruitment process was underway and the family was offered the weatherization application to complete. Although the application was in Spanish for Spanish speakers, it was typical that families needed help completing the application, so part of the role of the in-home pre-enrollment Visit was to ensure the application was completed accurately. For Vietnamese speakers a bi-lingual CHW helped fill out the application or a school age child who spoke English would help fill out the application form. At this point families had completed the screening process, could be officially recruited and the completed application was faxed to KCHA for approval and if approved then the enrollment appointment was scheduled. While the necessary paperwork and repair identification appeared to delay family recruitment in the eyes of what Public Health is accustomed to, the mechanism instituted was a necessary piece of the recruitment process when collaborating between two County systems…Having bi-lingual Community Health Workers who were able to meet leaders in the community to help recruit subjects and also alleviate confusion of non-English-speaking individuals… Lesson Learned: Multi-family landlords are easier to bring on board if the whole property can be treated in a healthy homes/weatherization fashion rather than one apartment in a complex.
Door to door outreach and patient referrals worked best as trust was established by CHWs and other Health Educators. Many of our participants believed in the program because someone they know have gone through it and improved their overall health… We also found that 20% of our clients moved during the time they were enrolled in the program, which sometimes made it challenging to reconnect**.**
With our population, reminders of appointment times were necessary within a couple days of the appointment to ensure that participants remembered the scheduled home visit. One-on-one communication was highly effective. Taking into account cultural differences was very important especially for home visits. Having culturally representative field staff was a key strategy to retaining enrollment from immigrant groups.
We believe our home environmental assessment/education/ and case management systems were highly effective. Our system for identifying participating families was also very effective utilizing our access to health utilization data and hospital clinics.
…The HHDP's original focus on low-income foster care children had to be broadened to include non-foster children. Not enough foster families were willing to enroll in the program. Some hesitated to open up their foster-care-system-approved homes to further inspection, while others resented the time commitment and intrusion into their private lives. Once the enrollment criteria were expanded, the program ended up with waiting lists of families for the HHDP.
This round of funding experienced few of the "typical" recruitment issues that are inherent in most grants. This was in large part due to a significant waiting list that was developed in the latter stages of the preceding CCHHI2. Recruitment centered on the waiting applicant pool and the awareness of the Weatherization delegates in identifying clients with chronic respiratory health conditions. Difficulties occurred in determining client eligibility

through the State of Ohio "Ocean" system. This system would periodically "close" recruitment. We also discovered that many applicants were not entered into this system during certain times of the year. Additionally we were not permitted access to this system in order to track an applicants' status. This required intensive application management at CCBH to track pending applications and conduct constant phone communication with the State Weatherization program. Monthly project meetings were held to insure all stages of the program were on track. Additionally having CTO as a subcontractor insured that applicants receiving environmental triage visits were promptly offered assistance in completing the HWAP application. It is important to budget for adequate resources to recruit and qualify prospective clients…. Partnering with HWAP and conducting an integrated program from the point of intake through completion….Having dedicated personnel committed to the management of the solicitation and recruitment process if selecting cases based upon health criteria AS WELL AS income qualification.
The majority of the challenges were overcame by talking to tenants, property managers and/or owner. Owners were willing to make up cost of repairs. Entrance to homes was achieved by working on weekends and evening.
Due to a gap in funding, many of health care providers in … thought the Healthy Homes Project was no longer in existence, therefore there were few referrals received in the first quarter. The Department had to carry out outreach to health care providers, hospitals and clinics. Department staff began to attend the Asthma Coalition meetings where many of the referrals originally came from and this increased awareness of the program among the health care providers which led to an increase in referrals… Clients not giving the department consent to contact the property owner of injury and health hazards found in the home by the HHS. There was a fear of retaliation that the clients experienced. The HHS explained to the clients that they have a right to live in a healthy home and provided resources to calm their fear of retaliation by the property owner. For example we provided the information of the following serviced by Centro Legal de la Raza and East Bay Community Law Center.
We decided on a "do no harm" approach collectively and to be advocates only.
…As with most home visiting programs, getting access to the homes is generally the most difficult task. We used community organizations and other trusted individuals (physicians and nurses) as our referral network to establish a trust with the client. We attended many community meetings and health fairs to be more visible. This was very time consuming but very effective. Our retention rate was around 80%. We partnered with refugee services and hired a Spanish speaking translator from a community organization to help with our non-English speaking families. Trust was a very big issue with these families so we were very aware. We use local code enforcement and letters from our office indicating code compliance to urge landlords to participate. We also explained how our program's education on home maintenance and cleaning will benefit them directly. There were a couple of times we helped families find a safer place to live.
The primary referral source for our HHD program were the local serving MCOs, health care providers, and the health department who referred asthma diagnosed children ages 2-14 who resided in low income properties. Due to the relationships that have been established with the health care provider community, we had a strong referral pipeline of potential, eligible applicants to the Program**…** Obtaining the consent of rental property owners was sometimes a challenge. Some rental property owners had to be counseled on the process and the program's benefits before agreeing to sign the Mutual Service Agreement (owner agreement) whereby they committed to affirmatively market and rent the property to low income families with children under age 6 for a period of three years post intervention. The Program was challenged by some rental property owners who declined the program's free intervention services. In these cases, the tenant desired the Program's services but is faced with an unresponsive landlord. Rental property owners were counseled by

program staff as described above in order to obtain their consent for the Healthy Homes interventions to occur. The Program developed match and leverage funded resources in the form of legal services and relocation services to address these impediments for safe housing for any other rental property owner who declined the program's services. In situations where rental property owners were unresponsive, the Coalition's Family Advocate Attorney assisted tenants in sending Notices of Defect to the owner by certified mail. If the owner failed to respond, the Family Advocate Attorney represented the tenant in Rent Court to establish a Rent Escrow account until the lead and Healthy Homes hazards were repaired. For tenants who needed immediate relocation or who were unwilling to pursue the Rent Escrow process, the Coalition obtained funding for a relocation assistance program that provided up to $1,000.00 for security deposit, first month's rent, or moving expenses to help a family move to lead certified housing. The relocation assistance program was instrumental in moving at risk families from hazardous housing to lead certified housing in the limited cases where the rental property owner cooperation and agreement was a challenge. The Green & Healthy Homes Initiative model of integrating Healthy Homes funding through a comprehensive intervention model that combined Healthy Homes, lead hazard reduction, weatherization, and energy efficiency interventions was very successful. By using the GHHI approach, high cost properties that would normally be deferred due to the severity of the hazards or structural defects were able to get completed through the Healthy Homes Demonstration Grant Program by combining match and leverage funding from other GHHI Baltimore partnering housing intervention programs. In the latter part of the grant period, the Program focused on enrolling higher numbers of children with more severe asthma and who had experienced asthma related emergency room visits and/or had asthma related hospitalization histories. In doing so, the deteriorated condition of the housing stock for applicants enrolling in the program also increased in direct correlation. As a result, the program encountered a higher percentage of client homes that exceeded the program's budget or level of intervention and required match or leverage funding sources for rehabilitation, roofing replacement, furnace replacement, higher level lead hazard reduction, mold remediation, or other structural repair in order to be able to complete the other Healthy Homes intervention components. Through the GHHI Baltimore collaborative and integrated process, the program was successful in coordinating with the City Department of Housing and Community Development to access additional housing intervention resources for families and complete intensive Healthy Homes interventions through the braiding of multiple funding resources.
During the initial enrollment period, NCHH encountered challenges from persistent cancellations and/or no-shows among residents who had scheduled appointments. Reminder notices mailed to the residents and phone calls failed to improve the problem. To address both no-shows and cancellations, NCHH set up a tent on the property grounds to encourage enrollment with no appointment. When adults visited, staff asked if they were from one of the three buildings scheduled for renovation in August. Interested adults were enrolled and interviewed (in a separate, private location) immediately. This approach greatly helped enrollment and data collection by removing the time gap between a recruitment appointment and the actual enrollment and data collection. During all enrollment and follow up periods, staff employed a variety of methods to contact residents for interviews, including letters, calls, personal visits and community events. Working with …, the president of the … Tenant Association and closely with other residents proved to be a critical part of project approach. [Her] on-site presence and familiarity with the community, and standing within the community allowed her to generate resident interest in the study and conduct frequent visits to set up enrollment and follow up appointments.
We leveraged a lead hazard control grant to motivate rental property owners to participate. We also leveraged lead abatement contractors to perform healthy homes' contracts.
We used a one page flier that we distributed through trusted community organizations and medical facilities. This was our most successful recruitment tool during this Grant.

The Healthy Homes Toolkit turned out to be a tremendous success, not only providing residents with practical tools for meeting Healthy Homes principles post-intervention, but also serving as an incentive to continued participation. The plan was for the toolkits to be given to the family while administering the follow-up questionnaire three months post-intervention. However, the program sites found giving a few pieces of the 11-piece toolkit at each visit effectively maintained an interest and continued participation in the applicant. This practice reduced the incidence of dropping out. The toolkits contained the following items: carbon monoxide detector; radon test kit; impervious allergen covers for twin-size mattress and pillow; mop and bucket; lidded kitchen trash can; micro-fiber cloths; non-toxic "green" multi-purpose cleaner and floor cleaner; and foam insulation/caulk. The average cost was $200. The toolkits also contained Healthy Homes fact sheets and pamphlets providing information about resources in the community.

TABLE 7.B: GRANTEE OBSERVATIONS ON CHALLENGES/LESS EFFECTIVE PRACTICES FOR RECRUITMENT, ENROLLMENT, AND RETENTION

Responses
We worked over a large geographic area in multiple housing/health jurisdictions, so there were often different practices when we became involved with poor rental housing.
Since we had a small geographical area in which to do the study it was a challenge to enroll in a timely fashion enough subjects to make a robust study.
Geographic target areas and using the child resident as the trigger for enrollment into the program not only reduces the program's ability to concentrate the projects, but also limits the ability to control the quality of housing stock that is recruited. Staff was surprised by the extremely poor condition of some of the housing that was recruited into the program and challenged to address those conditions with the available resources in a cost effective and defensible manner. Demonstration project, diverted staff time and delayed staffs' ability to produce benchmarks**.**
Loss of participants for follow-up, because they moved away.
One major issue that we face is a result of our tight rental market. In Oregon these is "no cause eviction". This means that unless there is a lease, the landlord or tenant may force someone to move without stated reason. One major issue that we face is a result of our tight rental market. In Oregon these is "no cause eviction". This means that unless there is a lease, the landlord or tenant may force someone to move without stated reason. Many households fear retaliation and that they will be evicted if they report needed housing repairs to their landlords. The rental market is the 1st or 2nd tightest housing market in the US, For this reason, it was sometimes difficult to convince tenants to approach landlords even if we were able to do the work for free. It is further complicated because the tight rental market results in many families doubling up which would be in violation of the lease agreement as well.
The initial program design used a six-month follow-up period. This resulted in a low-response rate to follow-up as phone numbers changed or clients failed to respond to contact attempts or declined further involvement. The follow-up period was changed to three-months which increased responsiveness.
Follow-ups with families were often very difficult to achieve. Families routinely stopped interacting with staff and would not return phone calls…
Geriatric: The house-bound patient population was too frail and usually bedridden so housing environment had little direct impact on their health, i.e. health status was too severe for housing factors to make an impact. We attempted to move to an ambulatory elderly population later in the study but were unable to adequately activate

the referral mechanism for us to achieve sufficient clients prior to the end of the grant period.
Trying to educate landlords. Most did not care, and were unresponsive unless corrective orders were written against their properties. Offering resources for repair would be ignored without an order. However, if our inspectors said "if this is corrected by Tuesday, I won't report this to the housing inspectors" they would often jump on repairs to avoid a black mark on their record.
Enrollment was below what we had predicted. Our recruitment was good, but very difficult to contact people to get them enrolled.
Limiting our recruitments/enrollments from the LBACA program slowed down our tempo and put us behind schedule. Designating an asthma severity classification or category and conducting the follow-up longer (6 months to a year compared to 3 months) may assist in indicating whether there is a statistically significance in these two intervention groups. Is asthma case management intervention alone good enough or is it better with hazard remediation - our finding suggests YES, but not statistically significant. Please see our complete Evaluation Report for more info.
Clients that did not make lifestyle changes were likely to self-select out of the process or be dropped by our Program. Clients which made minimal lifestyle changes had minimal health benefits… There were clients with overcrowding issues that made it impossible to garner buy-in.
There were a few that had absentee landlords or we would not contact the landlord without the tenant's permission usually because they were behind in their rent.
Recruitment was conducted using random digit dialing. We originally purchased land lines, however, found that many were non-working. We eventually purchased cell phone number[s] but many of the households lived outside of the eligible neighborhoods/zip codes.
We had a long waiting list by the end of the grant, and we had to inform all of the nurses and doctors that we were out of funds.

TABLE 7.C: GRANTEE OBSERVATIONS ON CHALLENGES IN PERFORMING ASSESSMENTS

Response
Development of new tools with areas of limited research caused some delays and challenges. Also the IRB process took some time to be approved and it delayed the process in terms of enrollment of participants. Working with new partners posed some challenges in the implementation of some activities of the project.
I don't know that any aspects were truly ineffective - but there were many things that we did not have to time or resources (financial or personnel) available to analyze. We did not budget sufficient funds for testing and analysis. We did not realize that dust samples were so much more costly to analyze than lead samples. We ran the grant with 2 FTEs and it was challenging to get the grant going, learn the grant requirements and the ARRA requirements, recruit clients and meet benchmarks. With just 2 FTEs we were busy with meeting the benchmarks and didn't have an opportunity to look at any data or come to any conclusions during the course of the funding cycle.
Environmental sampling for triggers related to asthma…
Even though there was a reduction in dust and allergen levels of the participating homes, the environmental allergen sampling portion of the project was exceptionally high in cost and staff time.

TABLE 7.D: BEST PRACTICES/MOST EFFECTIVE STRATEGIES/WAYS TO OVERCOME CHALLENGES IN INTERVENTIONS

Response
I think the education and behavior change focus combined with provision of trigger control tools/supplies was most effective. For units that had serious mold and moisture issues the housing intervention was very significant.
The educational approach for the client in making behavior changes in their home. Home visitors were trained in healthy homes principles and regularly consulted with home environmental professionals which enabled them to identify intervention strategies with high efficacy and tailor the intervention to each unit.
The education component of our program was particularly strong. We were able to come up with a curriculum that was easily translated to Spanish and kept our audiences interested in the information.
The smoking cessation aspect was the strongest and most effective component of our intervention….Smoking cessation that includes: incentives, free replacement nicotine products, free daycare, and big celebration over success.
1. Provide education to the clients about indoor asthma triggers and injury prevention with a focus on behavior changes. 2. Provide the client with technical assistance in contacting the property owner to address the hazards in the home as it pertains to asthma and injury prevention. 3. Provide education to property owners about indoor asthma triggers and injury prevention. 4. Provide tools and products to the client to assist them in maintaining a healthy home as well as providing the Environmental Treatment to the units with a focus on demonstrating how a healthy home needs to be maintained. 5. Serve as a resource to the clients and property owners, referring them both to organizations or agencies depending on their need to improve the home.
Inclusion of occupants throughout assessment and intervention as a primary education process.
For contractors after struggling with our sub-grantee to get work completed we ended up bypassing them for most work and using only contractors on the city dept. of development approved lead abatement licensed contractor list. We solicited bids on each unit for all work to be done for repairs and non-lead remediation. This group was already vetted and had a stake in maintaining their reputation with the city and did high quality lead safe work. Many tenants were afraid of their LL [landlord] having to correct minor issues. For landlords we told them the major work was free and most would sign off right away. For multi-unit buildings we simply referred all non-unit specific issues to code enforcement for correction because the LL would not know who made the complaint.
…The Department's strategy for protecting the maximum number of vulnerable children from environmental health and safety hazards was in large part successful. A multi-pronged approach which included education, hazard identification, physical remediation, behavior modification efforts, and follow-up activities comprehensively reached a large number of people with the message and impact of Healthy Homes…
"In general working with contractors can be difficult to manage time and costs. Close monitoring and clear communication of scope of work was how we managed. Also, we have an approval process at the Department of approving contractors and therefore, most contractors do their best to maintain positive client (State of Michigan) relationships.
We obtained a new contractor who worked faster and for less money that the original contractor.

Due to the intensive education component of the program, the HHU II staff has concluded that each family has different financial, social and emotional needs, as well as, a variable capacity to absorb information and make behavior changes. Therefore, the HHU II staff has learned to modify the education components to be family specific as opposed to making sure each family receives generalized information…The HHU II staff has determined that a combination of products, structural repair and significant client education is imperative to a successful program.
The program encountered occasional delays in getting SHPO historic review approval for individual units as part of the environmental review process but this was reduced through negotiations with the SHPO office to improve their response times. Some HHD units contained structural defects or severe hazards that exceeded the scope of program and/or its budget. These units would have been deferred without the development of the integrated GHHI Baltimore model that leveraged numerous private and public partner resources in order to complete comprehensive interventions.

TABLE 7.E: GRANTEE OBSERVATIONS ON CHALLENGES/LESS EFFECTIVE PRACTICES FOR INTERVENTIONS

Response
A decision to employ contractors that were both State certified in HWAP as well as licensed lead abatement contractors severely limited the contractor pool. Additionally it limited the participation of start-up HWAP contractors due to the lead licensing requirements. As a result a decision was made to subcontract the final cleaning to licensed lead abatement contractors that employ "clean only" crews to speed up job complete as well as providing workforce development opportunities. HWAP programs have aggressive program goals for unit production. HWAP programs may be reluctant to assume greater healthy homes considerations if they impact the speed of unit production. Weatherization program in the State of Ohio were disproportionately affected by the decision to extent the time period to utilize ARRA dollars in lieu of a new budget allocation from DOE. The State had been very efficient at spending the ARRA dollars by the original deadline and was without funds to sustain activities, This was the major reason for unit production difficulties and the diminishment of contractor capacity in April of 2012.
Healthy Homes hazard remediations were not big jobs (compared to LHC related jobs) for contractors so it was sometimes difficult to get them to bid for jobs so we made sure that we had at least 2-3 homes that were ready. Remediating a unit compared to a whole building made a big difference especially when it came to improving pest infestation and moisture intrusion. Education and demonstration played a significant role in our client's successes in maintaining their behaviors and in improving their asthma case management.
Our initial bidding process was ineffective. We should have retained a pool of contractors. Also our enrollment process may have been too long for the time frame of the project.
…Our inability to sustainably and effectively mitigate the health impacts of tobacco usage.
Our approach to IPM was not consistent in its application, monitoring or enforcement.
…Our screening for lead and radon was not as consistent and strong as we were striving for.
Another challenge was the severity of the housing deficiencies that we encountered. We had to "walk away" from

several houses due to the extreme nature of the repairs. With a projected combined mean Healthy Homes and Weatherization budget of approximately $6,000 per unit, several homes were beyond the scope of the program. If these were tenant-based properties the clients were advised to seek alternative housing. Every effort was made to link with existing services. The cost of the healthy home interventions ranged from $1,144 to $4,496 with a mean cost of $2,409. The mean cost of the weatherization interventions was $4,150. The actual mean combined project cost per unit was $6,559.
There were clients with overcrowding issues that made it impossible to garner buy-in.

TABLE 7.F: BEST PRACTICES/MOST EFFECTIVE STRATEGIES/WAYS TO OVERCOME CHALLENGES WITH PARTNERS

Response
Ongoing awareness of the intersection between health and housing. Rental code was changed for requiring removal of moldy sheetrock, instead of just painting over as a professional repair. Referrals from the medical community to our program became streamlined and increased over time, unfortunate part was grant ended and sustainability of referrals to an inspection mechanism were not in place yet.
Partnership with tribal community.
The overall partnerships with the Weatherization programs were the most significant component. This allowed for a more comprehensive and holistic intervention as well as maximizing the investment in the housing unit. It also permitted the weatherization of structures that may have previously been deferred due to healthy homes issues. Because all of our cases were occupied with clients suffering from chronic respiratory disease, deferment was not a viable option. Because of more carefully detailed guidelines of the weatherization program, this work was most effectively done and its benefits were most immediately recognized by the residents in terms of comfort and reduced energy costs. The one weatherization measure most closely identified with health, tying Cleveland Drops to the furnace cold air return opening, was least recognized by residents though it eventually could have the most positive health effects on asthmatic children in the homes… In this project more emphasis was placed on in home education of the occupants by the weatherization technician conducting the concurrent visit with the CCBH personnel. In addition to the HWAP standard items dealing with the use and maintenance of combustion appliances, time was also spent explaining the relationship of Rh, temperature and perceived comfort. A light switch wall plate was utilized as a feedback mechanism to explain the concept. Since contractors are used to having their weatherization work inspected, there were few major problems with this work.
For referrals working with established networks such as social workers and hospital clinic and primary care systems and provide an easy to complete fax and email referral sheet as well as be open to verbal referrals.
Close relationship with the local health care system.
Connect with nurses first, doctors are too busy. Combination inspection of an asthma educator and a healthy homes practitioner worked well. One to focus on the medical side, the other to focus on the housing structure. I don't believe our program would have been as strong and had such good results without both.
The health of children is improved when Public Health and Weatherization work together.
We found that while time consuming, the effort to identify as many other programs in the community that targeted the same groups that we were targeting was vital in recruiting participants. This approach also had the

advantage of being able to provide a more comprehensive approach to the clients we served.
The Healthy Homes Demonstration Grant Program played a key role in the development of the Green & Healthy Homes Initiative Baltimore Project that is demonstrating how a comprehensive assessment tool and a single stream intervention model can be effectively integrated into a HUD Healthy Homes Demonstration Grant funded project to produce whole house interventions that address indoor allergens, lead and safety hazards, structural defects, and energy loss comprehensively. The Safe at Home HHD Program should be looked on nationally as a proven model for how public housing and health department agencies can work effectively with private, non-profit agencies and HUD funded Healthy Homes programs. Safe at Home and GHHI Baltimore are also proving that coordinated interventions are possible that reduce total costs, create efficiencies, and develop systems that address the remediation of home-based environmental health hazards in low income homes. The GHHI model plays a critical role in ensuring that housing interventions that address environmental hazards result in benefits for the child occupying the home by helping the child's family remain in the home through reduced energy costs and financial stresses that can lead to homeowner foreclosure and tenant eviction. Example: Three HHD client properties that received HUD Healthy Homes interventions…also weatherized and made more energy efficiency through leverage funded interventions. The reduction in energy consumption in these homes produced energy cost savings of $678, $455, and $707 respectively (as documented by12 months pre and post intervention data analysis) that demonstrates how an integrated housing intervention approach can cost effectively produce enhanced benefits for low income families by both improving the safety of the home as well as improving the family's economic stability. The GHHI Learning Network, Leading Innovation for Green and Healthier Tomorrow (LIGHT), and Whole House Assessment Triage (WHAT) partnership network that the Coalition developed in conjunction with the City of Baltimore has continued to verify the success that can be achieved in addressing severely deteriorated homes through a leveraged approach that cost effectively braids housing intervention resources to generate solutions to homes requiring more costly interventions. Through GHHI Baltimore's single portal intake, comprehensive assessment forms, enhanced interagency communication, and the use of intervention coordinators, varied funding streams were able to be aligned and coordinated to produce Green & Healthy Homes where housing defects and home-based environmental health hazards issues are resolved as well as reducing energy consumption and energy costs. The Program's results in generating reductions in asthma episodes provides a strong basis for the utilization of similar Healthy Homes resident education, environmental assessment, and intervention programs. GHHI recommends that Healthy Homes grant funding be increased at the federal level for similar programs and that both CMS and private insurers initiate Healthy Homes and asthma intervention programs for clients who have asthma diagnosed children or provide prevention funding for such Healthy Homes interventions to occur to reduce doctor visits, ER visits, hospitalization, missed school days, and missed work days.
We brought these challenges up to our local Community Health Network Area and other community agencies we were worked with, and the topic was discussed as a community issue. Gradually agencies started to work more effectively, especially when in need for coordinated services. It is still a work in progress.
Value of Weekly Case Review: Weekly meetings for all HHDP staff and sub grantee partners to review completed assessments, discuss priorities and strategize interventions was invaluable. These meetings provided a forum for philosophical discussion of big pictures program issues, facilitated problem solving with all the necessary program parties present, increased the trust level between partners, and provided valuable information about program families' situations that staff needed to provide the best service. This process also enabled staff to identify problems early on and improved communication between the partners in general.

TABLE 7.G: GRANTEE OBSERVATIONS ON CHALLENGES/LESS EFFECTIVE PRACTICES FOR PARTERNESHIPS

Response
Coordinating services. Sometimes we had to work with families that already received some types of services, such as mental health, elder services and Department of Children and Families (DCF), and coordinating interventions with the other workers could present as a challenge.
Contracting with a tribal organization; staff turnover;
We had challenges with one partner involvement in the project planning and implementation. This partner was a partner who was not received funding from the project so at some point we made a decision not to spend a lot of our time chasing after them to have them be more involved in the project.
The process for selection of units would ensure that young children are present in the household receiving services. Properties were selected through four referral sources: (1) Breathmobile and school nurses, (2) Lead Hazard Control Program/Arizona Dept. of Health Services EBL cases, (3) Head Start, and (4) Arizona Dept. of Health Grant Program and other NSD housing rehab programs. Each of these referral sources are active in the Target Areas and largely serve low-income to very low income families. The overriding obstacle and lesson learned is that utilizing existing programs to provide comprehensive environmental health services to client children and their families is a time-consuming proposition and probably not a strategy well-suited to a time-sensitive grant. Projects had to go through additional program eligibility guidelines, time-consuming contracts, monitoring and approval, and scheduling with other contractor projects. Although this approach provided an excellent range of improvements in housing for participant families, and the program received positive feedback from those who referred children to the program, it was a major factor in the slow pace of the program and the failure to meet production goals within the first few quarters of the grant.

TABLE 7.H: BEST PRACTICES/MOST EFFECTIVE STRATEGIES/WAYS TO OVERCOME CHALLENGES ON PROGRAM MANAGEMENT

Response
We believe our home environmental assessment/education/ and case management systems was very strong. Our partner collaboration with the KCMO Health Dept. was and continues to be very strong.
A great working relationship with committed partners and staff.
Producing impact in reducing asthma episodes, reducing asthma hospitalizations, improving school attendance, and reducing missed work days by parents due to their child's asthma episodes, The highly leveraged GHHI integrated model was also highly effective as described below.
We were able to bring in an additional $105,000 in program income through targeted case management (Medicaid) which allowed us to increase our staffing level and services to clients.
• The staff has learned that quality control of all aspects of the program is imperative to success. More specifically, data collection, entry and management require significant training and standard re-evaluation and corrective action. • Without the assistance of interns and CDC Apprentices, the federal dollars alone are not sufficient in meeting all grant expectations. We needed more labor to do the project than what was anticipated and paid for.

Strong, committed partnerships and the development of a Work Plan with realistic goals and objectives.
Building partnerships and leveraging resources are critical for the success of any project and helps sustain your program to be so depending on funding.
The CAIR database was developed … to facilitate web based referrals, access from the field by multiple staff, collection of data and demographics, program evaluations, charting and documentation, The majority of the data system was developed by September 2010, but enhancements continued through the course of the grant. The system allowed outside organizations to submit referrals, and allowed us to track the status of the referrals and cases. Staff collected demographic information, income, provider support, family member/household data, housing data information and could report on this data. The system was used to manage caseloads, assign tasks and manage tasks for individual staff members or the team. It was used it to collect and audit visit data including documenting and evaluating initial and final environmental assessments, physical remediation visits, nursing visits, environmental interventions. The system was used to track the distribution and costs of supplies, Progress notes were used to document the narrative content of the visits. The system could be shared with other team members in the field through the use of I Pads or laptops but was confidential in case a devise was lost or stolen, Community referrals were tracked along with costs and status. The system also has the capacity to upload pictures and documents related to the chart, The development of this data base was essential to this program. It was also challenging to work through as we were implementing the grant, because it was not completed at the time we began. Every time a new change was implemented it required a change in workflow. It has enabled the program to get excellent data and evaluate our successes and opportunities in real time…. The CAIR Healthy Homes Demonstration Grant was very different from the Lead Hazard Control Program and many of the Healthy Homes programs, In our program the households stayed in the program four to nine months. Almost one-fifth (60) households moved to another address during the case management and that presented additional challenges. Clients were more likely to disappear from the program and we were often challenged to keep in contact with them, We often did work at multiple addresses. There was no way to reflect this additional work in QPRS. Because we were instructed to report on the last address, we had concerns that HUD was getting the most accurate housing data.
We had funds to relocate clients in Portland and unincorporated areas but no other jurisdictions. Due to the tight rental market it was often hard to find other housing to relocate to.
Training program for Community Health Workers (CHWs) - completing the Healthy Homes Practitioner Course with refresher workshops and additional role playing, Evaluation Training and being certified American Lung Association asthma case management facilitator greatly assisted in empowering our CHWs to do their best when conducting their home visits. Established partnership with LBACA and other asthma programs assisted our marketing and public relation activities. Most importantly, having a Program Evaluator who is knowledgeable and had relationships with local universities also assisted in the success of the program.
Intensely Dedicated and Committed Partners, Staff and Division Management: NSD staff, management team, partner organizations had the expertise, experience and drive to successfully implement this grant. When challenges occurred, everyone involved explored and identified best case scenarios and developed a "plan of attack" to effectively and collectively handle the situation.
Patience and perseverance. Our biggest challenge was working within the guidelines of the ARRA funding and timeline that it required.
Communication with partners, frequent planning meetings with the partners to monitor the progress of the project and finding solutions together for problems as they come up.

TABLE 7.I: GRANTEE OBSERVATIONS ON CHALLENGES/LESS EFFECTIVE PRACTICES ON PROGRAM MANAGEMENT

Response
With referrals to existing rehab programs, HHDP projects had to go through additional program eligibility guidelines, additional time-consuming contracts, Davis Bacon monitoring and approval, as well as "get in line" with other contractor projects. Although this approach provided an excellent range of improvements in housing for participant families, and the program received positive feedback from those who referred children to the program, it was a major factor in the slow pace of the program and the failure to meet production goals within the first few quarters of the grant. Given the extensive start-up demands of the program, the ever-changing ARRA requirements, the honing of the construction process, additional meetings and teleconferences, program and inter-department reviews and audits, and the lengthy problem-solving involved in a demonstration project, diverted staff time and delayed staffs' ability to produce benchmarks.
Relying on one sub-grantee to carry out a significant part of the physical work without a back-up plan or sharing the work load among others was a burden.
The initial program design used a six-month follow-up period. This resulted in a low-response rate to follow-up as phone numbers changed or clients failed to respond to contact attempts or declined further involvement. The follow-up period was changed to three-months which increased responsiveness. Some form of incentive for follow-up may have increased participation.
Sustainability, our healthy homes program is dissolving due to lack of funding.
The inability to link verifiable outcomes with interventions. Enrollments, outreach and community education, completion of units with necessary interventions, and capacity building are viewed as successes, but the fulfillment of those goals did not allow time for staff to properly review and extrapolate the data collected.
It was difficult to discern if health improvements were due to green renovation rather than "normal" renovation. One adult answered questions for herself and other household members, potentially introducing bias.
1. Costs. Most homeowners were not in a good financial position to be able to help defraying costs and there wasn't another program available. As much as possible we utilized YouthBuild program to help with labor costs. 2. Have homeowners comply. We believe fear was a major factor for homeowners to be reluctant to let us intervene in a more effective manner. Many homeowners were minority immigrants who destruct or fear authority. 3. The housing stock age and overall condition made it difficult to do a desired intervention that could be a more permanent solution.
Couldn't spend all the grant money due to less than expected enrollment.

CHAPTER 8: ACHIEVING THE FEDERAL INTERAGENCY OBJECTIVES

TABLE 8.A: GRANTEE OBSERVATIONS ON CHALLENGES/LESS EFFECTIVE PRACTICES ON THE GRANTS GENERALLY

Responses
We were using many of the materials prior to having the HUD HH grant and have developed others over time for use with general patient families as well as those participating in the HUD-funded grant activities.
Questionnaires, visual assessment and training curriculum provided to other agencies but we do not have information about their adaptation or adoption of these documents or if they are currently in use by these other agencies.
Several months ago we ended a 3 year Lead Hazard Reduction Program and we had a Healthy Homes component to it. We continued utilizing all written materials and education presentation I used with the previous program. Our established partnerships continued to the new grant and most important our credibility continues to open doors to families' homes to date. We have clients we helped seven years ago that periodically calls us for advice, referral and just to say hello. Putting our clients unmet needs first helped us to stay focused on what is most important, beyond our personal feelings… 1. Data gathered from participants and project partners showed a reduction in asthma symptoms, allergens and hospital visits after interventions were completed. These findings support the use of healthy homes interventions as a strategy to improve health and reduce health care costs. 2. Where housing deficiencies beyond the scope of the project were found, property owners were sent letters detailing the problems and requesting that repairs be made. Approximately 50% of property owners made repairs (78), with an average value of nearly $900 per unit.
Adaptations of some of these materials are going to be used in new HUD-COPD project… The major source of our success was the close relationships between the clients' physicians, the academic medical center and the long-term partnership with our community-based housing non-profit Environmental Health Watch. There should be more apparent, at the local level, cooperation between all the federal health-related agencies that impact Healthy Homes, i.e. NIH, CDC, EPA, DOE, and HUD.
As a current HUD grantee we are now using the HHRS assessment tool. Partnerships continue as resources allow, and referrals to and from past partnering agencies continue, although not at the same pace as when there were grant funds available… It remains frustrating that our state has not implemented yet reimbursement for healthy home practitioners, and products like allergen bedding, HEPA air cleaners and allergen vacuums. Some of this seems to be technical wrangling - why can't an air cleaner be considered a medical device? This grant and at least 3 other studies have been done locally, all showing similar results and improvements, it is time to stop ""Piloting"" and move to full implementation. We have been told the health plans will only do what increases their enrollment or what they are made to cover. Even though they ask for return on investment information, when provided with the information they still don't seem to move the dial into implementation. Many programs offer assistance for structural repairs while others address asthma and treat the people. What we liked about this project was the ability to address both in a comprehensive holistic manner.
In the absence of funding we have not been able to continue the integrated approach of this study. Since the manager position was paid for with the HUD grant and the grant has ended there is no funding to support a person to promote a local Healthy Homes program to local philanthropic organizations.
Healthy Homes principles and strategies are being integrated into NSD's Housing Rehab programs and

contractor training initiatives. Each rehab project now receives a whole house assessment using an integrated healthy homes assessment tool. Partnerships with schools, community and faith-based organizations also offered opportunities to teach community leaders, parents, and school staff healthy homes principles so they in turn can teach others in their community. Sharing home safety findings and teaching approaches with community health and human service personnel will also build capacity for sustained intervention and education… This was a challenging project, but well worth it. Staff was excited about the "concept" and the ability to incorporate what we learned into other programs. Single interventions and the ability to assess homes for other health and safety hazards will provide the consolidation of work program staff needs and residents deserve.
Unfortunately the manner in which the DOE $ flow to the State and to the sub-recipients has changed. Currently all HWAP $ are managed by the City of Cleveland. No longer does the County proper receive their share of HWAP $ for local control.
We are hopeful that in the future HUD will receive the necessary funding from Congress to offer the HUD HH funding again. While it is helpful to offer the supplemental HH funding to Lead grantees, it prohibits the ability to work with anyone that does not have an identified lead hazard.
It was the intention of the HHDP to utilize general contractors who were also lead-certified contracting firms, and to combine needed Healthy Homes work with any needed LHC. Combining work on some homes would have saved precious resources for other projects. However, the requirements of DBRA applied to the HHDP meant that the contractors could not save any money by including LHC work. The LHC would have needed to have been completed at prevailing wage rates, driving up costs.
It would be helpful for grantees to have clear policy guidance from HUD to guide through the grant implementation process. Sometimes some of the policy guidance were not always clear and posed some challenges to the grantee.
GHHI believes that increased Healthy Homes intervention funding by HUD and other federal agencies is needed due to the scarcity of such resources nationally. The target Baltimore City communities and properties serviced by this HUD HHD Program have a severe need for the type of free, community-based Healthy Homes Program that was offered by this grant. Without these types of resources, many families and owners will be unable or unwilling to perform the hazard interventions necessary to reduce indoor allergens, lead hazards, and safety or injury risks. In most instances, families in low income at risk communities have limited financial resources and cannot afford the costs of simple indoor allergen reduction measures such as mattress and pillow covers or HEPA-vacuums and safety items such as smoke alarms and carbon monoxide alarms. Replicating similar community-based Healthy Homes programs that are intervention focused is critical to reducing indoor allergens as well as preventing safety and injury risks. While resident education is a critical component, it will be hard to achieve public health success in reducing asthma episodes, emergency room visits, and hospitalizations consistently in urban areas without housing intervention program that can provide physical interventions to address higher level hazards that cannot effectively or safely be remediated by the resident. The Program did find that practical lower level indoor allergen reduction and safety hazard reductions could be achieved cost efficiently and affordably within the structure of any initial assessment and resident education model. The Safe at Home HHD Program was able to install safety hazard and injury prevention items during its initial environmental assessment and resident educations. This model produced higher successful intervention rates by insuring that safety hazard prevention tools were installed and integrated pest management was performed at the first home visit. This reduced the need for follow-up visits which may not be completed due to multiple variables. Based on its experience, the Coalition recommends that HUD integrate simple safety hazard interventions into all Healthy Homes and lead hazard reduction models. The Program recommends that the installation of practical, safe hazard reduction measures be considered for adoption in all OHHLHC intervention

programs. The Program believes that funding for higher level Healthy Homes interventions must still be increased to the meet current need for such services but the Program also recommends that cost effective supplies such as mattress and pillow covers, HEPA-vacuums, IPM measures, and indoor allergen reduction cleaning kits be provided as part of a broad-based, basic asthma reduction program in urban areas that can cost effectively help reduce asthma episodes at a lower cost scale.
Community members still call to find out about the Program even though it ended two years ago. It has had a lasting impact on the community. 2 clients have become involved with local asthma coalition. The research is being used to encourage a pilot project with a health care provider now.
We have kept many of our recruitment/enrollment and education strategies in our air quality/asthma case management programs not funded by HUD. We value the Healthy Homes principles and are using these models created by HUD and its partners to continue to educate and empower our residents. …we are very excited to see the overall results of this particular survey as we all know that we make a difference -- not just from the data we gather but from the stories we hear from the families we work with. I hope that HUD will find a way to elevate Healthy Homes types of programs as I personally feel that there's a lot of education/empowerment that is missing with the current HH/LHC integration.
In doing this project our team was able to develop a novel risk-based scale, the Housing and Neighborhood Index (HANI), a proxy for cumulative housing and neighborhood characteristics that pose the health risk to residents. The HANI was found to be a predictor of household disease symptoms burden, childhood asthma, neighborhood satisfaction, and perception of neighborhood condition even after controlling for socioeconomic factors.

APPENDIX 3: GRANTEE-REPORTED ASTHMA- RELATED MEASURES AND CHANGES IN OUTCOMES

This Appendix presents detailed data provided by grantees on the eight key asthma indicators that were included in the 2014 survey. For each grantee that reported a change in an asthma indicator, it summarizes the operational measure used, the grantee's time frames for data collection, and whether a test of significance was reported. To create these tables, first, the survey response narratives were reviewed and summarized; then, the final reports were examined for more detailed data on asthma indicators and outcomes. Only one grantee provided a peer-reviewed publication; the data is included in the table. The authors of this report did not attempt to access or review other peer-reviewed publications.

The responses of grantees that answered the questions on asthma outcomes, but did not provide detail in the narratives are summarized below.

Grantee	ED Visits	Hospitalizations	Days with Worsening Symptoms	Symptom-free Days	Nighttime symptoms	Days missed	Use of Rescue Inhaler	Limits on Activity
Multnomah County, OR	I	I	I	No Data	I	No Data	I	I
Cleveland and Cuyahoga County, OH	I	I	I	I	I	I	I	I
American Lung Association of the Midwest	NC	NC	I	II	I	I	NA	I
Kenosha Community Partnership	I	I	I	I	I	I	I	I
Boston Public Health Commission, MA	I	I	I	I	I	I	I	I
National Center for Healthy Housing	NC	NA	NC	NA	NC	NC	NC	NC

- I = improved; NC = no change; W = worsened; NA = grantee did not include this indicator in their measures

If no narrative data on grantees' asthma outcome measures were provided in the 2014 survey or final reports, the grantees do not appear in the following tables. The Solutions' team did not have access to grantee final reports for the Boston Public Health Commission, Cleveland and Cuyahoga County, OH, and Multnomah, OR, and there was no detail on changes in measures provided in the survey narratives. (For Cleveland and Cuyahoga County, the respondents answered the survey based on the most recent grant, but Solutions only had access to the final report for an earlier grant.) The final reports for Phoenix, AZ;

Children's Mercy Hospital, MO; Kenosha Communities Partnership; and the American Lung Association of the Midwest, did not contain more detail on the asthma measures and outcomes. The Montana State University's Extension Tribal Healthy Homes and the National City, CA did not track outcomes related to asthma**.** The University of Michigan, Saginaw County Department of Public Health grant mainly focused on the development of the Health Hazard Index (HHI). Data on asthma related to demographics of the target area, such as race and income level, but did not include health outcomes related to asthma. The National Center for Healthy Housing's (MDLHH0156-07) survey responses indicated that there were no changes in the indicators, but the final report states that: "Only a few children (16%) and adults (11%) had asthma at the baseline visit, and there was no significant change in the percentage of either adults or children with current asthma."

Asthma Indicator	Specific measure	Time Period Assessed	Change reported	Number Assessed at baseline, Number Assessed at Follow-up	Statistical Significance Reported	Data Source
ED Visits	ED visits (Children's Health Survey for Asthma –CHSA)	Past 4 week; assessed at baseline and 1 year follow- up	Mean of 0.05 at baseline; mean of 0.00 at follow-up	172 children, 116	Significant, no P value specified	U Mass/Lowell MALHH0171-08 Grantee Final Report
	ED visits (Program's Tool – PT)	Past 3 months; assessed at baseline and 6 month follow-up	53 children went to the ER at baseline and 29 did at follow up (83% reduction); mean of 1.12 at baseline; mean of 0.48 at follow-up	120 children, 99	Significant, no P value specified	Columbus Public Health 2014 HHD Survey responses
	ED visits	Time period not specified; assessed at baseline; 3-month follow up; 12-month follow up	Reduction from baseline to 12-month follow up, no data specified	548 children, 294	Significant; matched pairs t-test, two-tailed, $p<0.05$	City of Minneapolis 2014 HHD Survey responses; MNLHH0149-06 Grantee Final Report
	ED visits	Previous year assessed at baseline; 3-month follow up	Standard intervention: 84% reduction at 3-month follow up Intensive intervention: 71% reduction at 3-month follow up	200 households, 179	N/A, no p value specified	Long Beach 2014 HHD Survey; CALHH01088-08 Grantee Final Report
	Gone to the ER for asthma problems	Previous month,; assessed at baseline and at follow up	8.6% reported at baseline, 8.6% reported at follow up	116 participants, 116	Not significant, p=1.000	Harris County TXLHH0179-08 Grantee Final Report

Asthma Indicator	Specific measure	Time Period Assessed	Change reported	Number Assessed at baseline, Number Assessed at Follow-up	Statistical Significance Reported	Data Source
ED Visits	ED Visits	Previous 6 months; assessed at baseline and 6-month follow up	45.9 % reported at baseline, 12.8% reported at 6-month follow up (decrease of 72%)	233 children, 159	Significance not specified, no p value specified	MI Dept. of Community Healthy Homes MILHH0163-08 Grantee Final Report
	ED visits	Previous month,; assessed at baseline and 6-month follow up	Mean of 0.88 at baseline, mean of 0.19 at 6-month follow up	156 families, 108	Significance not specified, no p value specified	Milwaukee WILHH0189-08 Grantee Final Report

Asthma Indicator	Specific measure	Time Period Assessed	Change reported	Number Assessed at baseline, Number Assessed at Follow-up	Statistical Significance Reported	Data Source
Urgent Care Visits	Doctor's office visit(Children's Health Survey for Asthma –CHSA)	Past 4 weeks; assessed at baseline and 1 year follow-up	Mean of 0.68 at baseline; mean of 0.24 at follow-up	172 children, 116	Significant, no P value specified	U Mass/Lowell MALHH0171-08 Grantee Final Report
	Doctor's office visits w/o advanced appointment (Program's Tool – PT)	Past 3 months, assessed at baseline and 6 month follow-up	50 participants reported at baseline and 31 reported at follow up (61% reduction); mean of 0.89 at baseline; mean of 0.52 at follow-up	120 children, 99	Significant, no P value specified	Columbus Public Health 2014 HHD Survey responses
	Doctor's office visits, unanticipated	Time period not specified; assessed at baseline; 3-month follow up; 12-month follow up	Reduction from baseline to 12-month follow up, no data specified	548 children, 294	Significant; matched pairs t-test, two-tailed, $p<0.05$	City of Minneapolis 2014 HHD Survey responses; also MNLHH0149-06 Grantee Final Report
	Urgent clinical care in previous 12 months (Program's Tool)	Study group: baseline, 12-month follow up Comparison group: baseline, 14-month follow up	Study group: 93.5% at baseline, 61.8% at 12-month follow up Comparison group: 89.9% at baseline, 66.2% at 14-month follow up	Study group: 34 children, 34 Comparison group: 61 children, 61	Study group: significant, p=0.01 Comparison group: significant, p=0.003 Study vs Comparison: not significant, p=0.553	Highline Communities Healthy Homes Program - Breysse J, Dixon S, Gregory J, Philby M, Jacobs DE, Krieger J. Effect of weatherization combined with community health worker in-home education on asthma control. *Am J Public Health*. 2014; 104(1):57-64.
Asthma Indicator	**Specific measure**	**Time Period Assessed**	**Change reported**	**Number Assessed at baseline, Number Assessed at Follow-up**	**Statistical Significance Reported**	**Data Source**

Urgent Care Visits	Health care visits – had at least 1	Past 3 months; assessed at baseline and at 3-month follow up	15 reported at baseline, 10 reported at 3-month follow up	45 children, 45	N/A, no p value specified	PA Dept. of Health 2014 HHD Survey responses, also PALHH0170-08 Grantee Final Report
	Average number of health care visits per quarter	Past 3 months; assessed at baseline and at 3-month follow up	Average of 2.71 at baseline, average of 0.63 at 3-month follow up	45 children, 45	N/A, no p value specified	PA Dept. of Health 2014 HHD Survey responses, also PALHH0170-08 Grantee Final Report
	Doctor's office visit (Health Assessment Survey)	Past 6 months; assessed at baseline and 6-month follow up	50% increase in reporting never having to visit from baseline to 6-month follow up	149 children, 149	N/A, no p value specified	Coalition to End Childhood Lead Poisoning 2014 HHD Survey responses, also MDLHH0160-07 Grantee Final Report
	Doctor's office visits, unscheduled	Previous year assessed at baseline; 3-month follow up	Standard intervention: 59% reduction at 3-month follow up Intensive intervention: 73% reduction at 3-month follow up	200 households, 179	N/A, no p value specified	Long Beach 2014 HHD Survey; CALHH01088-08 Grantee Final Report
	Gone to a doctor's office or clinic for a sudden asthma attack	Previous month; assessed at baseline and at follow up	14.9% reported at baseline, 12.3% reported at follow up	114 participants, 114	Not significant, p=0.607	Harris County TXLHH0179-08 Grantee Final Report
	Gone to a doctor's office for on-going asthma check-ups	Previous month; assessed at baseline and at follow up	20.2% reported at baseline, 19.3% reported at follow up	114 participants, 114	Not significant, p=1.000	Harris County TXLHH0179-08 Grantee Final Report

Asthma Indicator	Specific measure	Time Period Assessed	Change reported	Number Assessed at baseline, Number Assessed at Follow-up	Statistical Significance Reported	Data Source
Urgent Care Visits	Urgent treatment of asthma symptoms to a healthcare provider	Previous 6 months; assessed at baseline and 6-month follow up	66.5% reported at baseline, 30.2% reported at 6-month follow up (decrease of 30%)	233 children, 159	Significance not specified, no p value specified	MI Dept. of Community Healthy Homes MILHH0163-08 Grantee Final Report
	Routine asthma visit to a healthcare provider	Previous 6 months; assessed at baseline and 6-month follow up	82% reported at baseline, 91.9% reported at 6-month follow up	233 children, 159	Significance not specified, no p value specified	MI Dept. of Community Healthy Homes MILHH0163-08 Grantee Final Report

Asthma Indicator	Specific measure	Time Period Assessed	Change reported	Number Assessed at baseline, Number Assessed at Follow-up	Statistical Significance Reported	Data Source
Hospitalizations	Hospitalizations (Children's Health Survey for Asthma – CHSA)		Mean of 0.68 at baseline; mean of 0.24 at follow-up	172 children, 116	Significant, no P value specified	U Mass/Lowell MALHH0171-08 Grantee Final Report
	Hospitalizations (Program Tool)	Past 3 months; assessed at baseline and 6 month follow-up	8 reported at baseline and 4 reported at follow up (50% reduction); mean of 0.16 at baseline; mean of 0.08 at follow-up	120 children, 99	Significant, no P value specified	Columbus Public Health 2014 HHD Survey responses
	Hospitalizations	Time period not specified; assessed at baseline; 3-month follow up; 12-month follow up	Reduction from baseline to 12-month follow up, no data specified	548 children, 294	Significant; matched pairs t-test, two-tailed, $p<0.05$	City of Minneapolis 2014 HHD Survey responses; also MNLHH0149-06 Grantee Final Report
	Hospitalizations	Past 1 year; assessed at baseline and 1 year follow- up	Total # of 50, annual rate of 1.85 at baseline; total # of 20, annual rate of 0.76 at follow-up (58.6% decrease). 10 (67%) of the 15 children previously hospitalized had improvement at follow up (fewer or no hospitalizations)	29 children, 29	Not specified	Case Western Reserve 2014 HHD Survey responses; also OHLHH0164-08 Grantee Final Report

Asthma Indicator	Specific measure	Time Period Assessed	Change reported	Number Assessed at baseline, Number Assessed at Follow-up	Statistical Significance Reported	Data Source
Hospitalizations	Pediatric Intensive Care Unit (PICU)	Past 1 year; assessed at baseline and 1 year follow- up	Total # of 19, annual rate of 0.38 at baseline; total # of 6, annual rate of 0.30 at follow up (67.4% decrease)	29 children, 29	Not specified	Case Western Reserve 2014 HHD Survey responses
	30 days Re-Admit	Past 1 year; assessed at baseline and 1 year follow- up	Total # of 6, annual rate of 0.12 at baseline; total # of 0, annual rate of 0.0 at follow up (100% decrease)	29 children, 29	Not specified	Case Western Reserve 2014 HHD Survey responses
	Hospitalizations (Health Assessment Survey)	Past 6 months; assessed at baseline and 6-month follow up	60% reduction in asthma related hospitalizations from baseline to 6-month follow up	149 children, 149	N/A, no p value specified	Coalition to End Childhood Lead Poisoning 2014 HHD Survey responses; also MDLHH0160-07 Grantee Final Report
	Hospitalizations	Previous year assessed at baseline; 3-month follow up	**Standard intervention**: 74% reduction at 3-month follow up **Intensive intervention**: 74% reduction at 3-month follow up	200 households, 179	N/A, no p value specified	Long Beach 2014 HHD Survey; CALHH01088-08 Grantee Final Report
	Been in the hospital overnight or longer for asthma	Previous month: assessed at baseline and at follow up	7% reported at baseline, 3.5% reported at follow up	115 participants, 115	Not significant, p=0.289	Harris County TXLHH0179-08 Grantee Final Report
	Hospitalizations	Previous 6 months; assessed at baseline and 6-month follow up	10.7% reported at baseline, 1.9% reported at 6-month follow up (decreased of 82%)	233 children, 159	Significance not specified, no p value specified	MI Dept. of Community Healthy Homes MILHH0163-08 Grantee Final Report

Asthma Indicator	Specific measure	Time Period Assessed	Change reported	Number Assessed at baseline, Number Assessed at Follow-up	Statistical Significance Reported	Data Source
Days with Worsening Symptoms	Episodes of Wheezing (Children's Health Survey for Asthma –CHSA)	Past 4 weeks; assessed at baseline and 1 year follow- up	Mean of 6.58 at baseline; mean of 2.26 at follow-up	172 children, 116	Significant, no P value specified	U Mass/Lowell MALHH0171-08 Grantee Final Report
	Asthma Attacks (Children's Health Survey for Asthma –CHSA)	Past 4 weeks; assessed at baseline and 1 year follow- up	Mean of 0.79 at baseline; mean of 0.19 at follow-up	172 children, 116	Significant, no P value specified	U Mass/Lowell MALHH0171-08 Grantee Final Report
	Child have daytime asthma symptoms (PT)	Past 14 days; assessed at baseline and 6 month follow-up	Mean of 5.02 (0-14) at baseline; mean of 2.59 (0-14) at follow-up	120 children, 99	Significant, no P value specified	Columbus Public Health 2014 HHD Survey responses
	Daytime symptoms (ITG – Program's own tool)	Time period not specified; assessed at baseline; 3-month follow up; 12-month follow up	Burden score reduced by 24.8 points on average	548 children, 294	Significant, $p<0.05$	City of Minneapolis MNLHH0149-06 Grantee Final Report
	Asthma not well controlled or very poorly controlled (Program Tool)	**Study group**: baseline, 12-month follow up **Comparison group**: baseline, 14-month follow up	**Study group**: 100% at baseline, 28.8% at 12-month follow up **Comparison group**: 100% at baseline, 51.6% at 14-month follow up	**Study group**: 33 children, 33 **Comparison group**: 68 children, 68	**Study group**: significant, $p<0.001$ **Comparison group**: significant, $p<0.001$ **Study vs Comparison**: significant, $p=0.04$	Highline Communities Healthy Homes Program -- Breysse J, Dixon S, Gregory J, Philby M, Jacobs DE, Krieger J. Effect of weatherization combined with community health worker in-home education on asthma control. *Am J Public Health*. 2014; 104(1):57-64.

Asthma Indicator	Specific measure	Time Period Assessed	Change reported	Number Assessed at baseline, Number Assessed at Follow-up	Statistical Significance Reported	Data Source
Days with Worsening Symptoms	Asthma attacks in previous 3 months (Program Tool)	Study group: baseline, 12-month follow up Comparison group: baseline, 14-month follow up	Study group: Mean of 1.7 at baseline, mean of 0.9 at 12-month follow up Comparison group: Mean of 3.5 at baseline, mean of 1.2 at 14-month follow up	Study group: 34 children, 34 Comparison group: 66 children, 66	Study group: Significant, p=0.027 Comparison group: Significant, p=0.006 Study vs Comparison: Not significant, p=0.092	Highline Communities Healthy Homes Program -- Breysse J, Dixon S, Gregory J, Philby M, Jacobs DE, Krieger J. Effect of weatherization combined with community health worker in-home education on asthma control. *Am J Public Health*. 2014; 104(1):57-64.
	Asthma symptoms and severity (Asthma Severity Assessment)	Baseline, 6-month follow up	67% reduction reported	287 children, 287	N/A, no p value specified	Alameda County CALHH0150-06 Grantee Final Report
	Caregiver rating on asthma severity (10-point scale, 1=low, 10-high)	Past 3 months; assessed at baseline and at 3-month follow up	Average of 6.33 at baseline, average of 3.83 at 3-month follow up	18 children, 18	N/A, no p value specified	PA Dept. of Health 2014 HHD Survey responses; also PALHH0170-08 Grantee Final Report
	Asthma symptoms and severity (Asthma Severity Assessment)	Baseline, 6-month follow up	67% reduction reported	287 children, 287	N/A, no p value specified	Alameda County CALHH0150-06 Grantee Final Report

Asthma Indicator	Specific measure	Time Period Assessed	Change reported	Number Assessed at baseline, Number Assessed at Follow-up	Statistical Significance Reported	Data Source
Days with Worsening Symptoms	Caregiver rating on asthma severity (10-point scale, 1=low, 10-high)	Past 3 months; assessed at baseline and at 3-month follow up	Average of 6.33 at baseline, average of 3.83 at 3-month follow up	18 children, 18	N/A, no p value specified	PA Dept. of Health 2014 HHD Survey responses; also PALHH0170-08 Grantee Final Report
	Daytime symptoms	Previous year assessed at baseline; 3-month follow up	**Standard intervention**: 90% reported good control of asthma at 3-month follow up; 57% without good control were able to gain control **Intensive intervention**: 91% reported good control of asthma at 3-month follow up; 43% without good control were able to gain control	200 households, 179	N/A, no p value specified	Long Beach 2014 HHD Survey, CALHH0188-08 Grantee Final Report
	Had an asthma attack during the day	Previous month assessed at baseline and at follow up	16.7% reported at baseline, 15.8% reported at follow up	114 participants, 114	Not significant, p=1.000	Harris County TXLHH0179-08 Grantee Final Report
	Number of times child had wheezing (5-point scale, 1=None of the time, 5=All of the time)	Previous month; assessed at Baseline and 6-month follow up	Mean of 1.54 at baseline, mean of 1.04 at 6-month follow up	165 children, 165	Significant, no p value specified	Esperanza CALHH0176-08 Grantee Final Report
	Number of times child has trouble breathing (5-point scale, 1=None of the time, 5=All of the time)	Previous month; assessed at Baseline and 6-month follow up	Mean of 1.74 at baseline, mean of 1.02 at 6-month follow up	168 children, 168	Significant, no p value specified	Esperanza CALHH0176-08 Grantee Final Report

Asthma Indicator	Specific measure	Time Period Assessed	Change reported	Number Assessed at baseline, Number Assessed at Follow-up	Statistical Significance Reported	Data Source
Days with Worsening Symptoms	Number of times child has an asthma attack (5-point scale, 1=None of the time, 5=All of the time)	Previous month; assessed at Baseline and 6-month follow up	Mean of 1.38 at baseline, mean of 0.93 at 6-month follow up	103 children, 103	Not significant, no p value specified	Esperanza CALHH0176-08 Grantee Final Report
	Rating of child with tightness in the chest (5-point scale, 1=All of the time, 5=None of the time)	Previous month; assessed at Baseline and 6-month follow up	Mean of 4.23 at baseline, mean of 4.40 at 6-month follow up	213 children, 213	Significant, no p value specified	Esperanza CALHH0176-08 Grantee Final Report
	Rating of child with shortness of breath (5-point scale, 1=All of the time, 5=None of the time)	Previous month; assessed at Baseline and 6-month follow up	Mean of 4.10 at baseline, mean of 4.52 at 6-month follow up	216 children, 216	Significant, no p value specified	Esperanza CALHH0176-08 Grantee Final Report
	Had wheezing first thing in the morning	Previous 6 months; assessed at baseline and 6-month follow up	Mean of 5.1 at baseline, mean of 2.6 at 6-month follow up	233 children, 159	Significance not specified, no p value specified	MI Dept. of Community Healthy Homes MILHH0163-08 Grantee Final Report
	Had shortness of breath because of asthma	Previous 6 months; assessed at baseline and 6-month follow up	Mean of 8.4 at baseline, mean of 3.7 at 6-month follow up	233 children, 159	Significance not specified, no p value specified	MI Dept. of Community Healthy Homes MILHH0163-08 Grantee Final Report

Asthma Indicator	Specific measure	Time Period Assessed	Change reported	Number Assessed at baseline, Number Assessed at Follow-up	Statistical Significance Reported	Data Source
Days with Worsening Symptoms	Had wheezing or tightness in the chest or cough	Previous 6 months; assessed at baseline and 6-month follow up	Mean of 12.8 at baseline, mean of 7.2 at 6-month follow up	233 children, 159	Significance not specified, no p value specified	MI Dept. of Community Healthy Homes MILHH0163-08 Grantee Final Report
	Wheezing or whistling in the chest	Last 12 months; assessed at baseline and at (unspecified time) follow up	97 units reported at baseline, 71 units reported at follow up (27% reduction)	113 families, 113	Significance not specified, no p value specified	Self Help MALHH0175-08 Grantee Final Report
	With a cold including a cough lasting more than 10 days	No time specified; assessed at baseline and at (unspecified time) follow up	75 units reported at baseline, 32 units reported at follow up (57%)	113 families, 113	Significance not specified, no p value specified	Self Help MALHH0175-08 Grantee Final Report

Asthma Indicator	Specific measure	Time Period Assessed	Change reported	Number Assessed at baseline, Number Assessed at Follow-up	Statistical Significance Reported	Data Source
Symptom-free Days	Symptom-free days in previous 2 weeks (Program's Tool)	**Study group**: baseline, 12-month follow up **Comparison group**: baseline, 14-month follow up	**Study group**: Mean of 8.4 at baseline, mean of 11.9 at 12-month follow up **Comparison group**: Mean of 8.8 at baseline, mean of 11.8 at 14-month follow up	**Study group**: 34 children, 34 **Comparison group**: 68 children, 68	**Study group**: Significant, p<0.001 **Comparison group**: Significant, p<0.001 **Study vs Comparison**: Not significant, p=0.673	Highline Communities Healthy Homes Program -- Breysse J, Dixon S, Gregory J, Philby M, Jacobs DE, Krieger J. Effect of weatherization combined with community health worker in-home education on asthma control. *Am J Public Health*. 2014; 104(1):57-64.
	Did not work harder to breathe (Health Assessment Survey)	Past 6 months; assessed at baseline and 6-month follow up	88% increase in reporting from baseline to 6-month follow up	149 children, 149	N/A, no p value specified	Coalition to End Childhood Lead Poisoning 2014 HHD Survey responses; also MDLHH0160-07 Grantee Final Report
	Asthma well controlled (Health Assessment Survey)	Past 6 months; assessed at baseline and 6-month follow up	55% increase in reporting from baseline to 6-month follow up	149 children 149	N/A, no p value specified	Coalition to End Childhood Lead Poisoning 2014 HHD Survey responses; also MDLHH0160-07 Grantee Final Report
	Test for Respiratory Control of Asthma in Kids (TRACK)	Previous month,; assessed at baseline and 6-month follow up	Average of 49 at baseline, average of 77 at 6-month follow up	156 families, 108	Significance not specified, no p value specified	Milwaukee WILHH0189-08 Grantee Final Report

Asthma Indicator	Specific measure	Time Period Assessed	Change reported	Number Assessed at baseline, Number Assessed at Follow-up	Statistical Significance Reported	Data Source
Use of Rescue Inhaler	Except for prescribed use before exercise, child have to use quick relief medication (Program Tool)	Past 14 days and nights; assessed at baseline and 6 month follow-up	Mean of 4.68 (0-14) at baseline; mean of 2.03 (0-14) at follow-up	120 children, 99	Significant, no P value specified	Columbus Public Health 2014 HHD Survey responses
	Use of oral systemic corticosteroids for exacerbations	Time period not specified; assessed at baseline; 3-month follow up; 12-month follow up	Reduction from baseline to 12-month follow up, no data specified	548 children, 294	Significant; matched pairs t-test, two-tailed, $p<0.05$	City of Minneapolis 2014 HHD Survey responses; also MNLHH0149-06 Grantee Final Report
	Days rescue medicine used in previous 2 weeks (Program Tool)	Study group: baseline, 12-month follow up Comparison group: baseline, 14-month follow up	**Study group:** Mean of 5.7 at baseline, mean of 1.7 at 12-month follow up Comparison group: Mean of 5.0 at baseline, mean of 2.2 at 14-month follow up	Study group: 34 children, 34 Comparison group: 68 children, 68	Study group: Significant, $p<0.001$ Comparison group: Significant, $p<0.001$ Study vs Comparison: No significant, $p=0.338$	Breysse J, Dixon S, Gregory J, Philby M, Jacobs DE, Krieger J. Effect of weatherization combined with community health worker in-home education on asthma control. *Am J Public Health*. 2014; 104(1):57-64.
	Use of quick-relief or inhaled medications, proper reliance of 2 or fewer uses per week	Previous year assessed at baseline; 3-month follow up	**Standard intervention:** 80% of those reporting over reliance at baseline, reported proper reliance at follow up Intensive intervention: 73% of those reporting over reliance at baseline, reported proper reliance at follow up	200 households, 179	N/A, no p value specified	Long Beach HHD Survey; CALHH0188-08 Grantee Final Report

	Use of rescue inhalers	Baseline, 6-month follow up	Decreased an average of 5.2 uses per day	287 children, 287	N/A, no p value specified	Alameda County CALHH0150-06 Grantee Final Report

Asthma Indicator	Specific measure	Time Period Assessed	Change reported	Number Assessed at baseline, Number Assessed at Follow-up	Statistical Significance Reported	Data Source
Nighttime symptoms	Child wakes up due to asthma symptoms (Program Tool)	Past 14 nights; assessed at baseline and 6 month follow-up	Mean of 3.26 (0-14) at baseline; mean 1.27 (0-14) at follow-up	120 children, 99	Significant, no P value specified	Columbus Public Health 2014 HHD Survey responses
	Nighttime symptoms (ITG – Program's own tool)	Time period not specified; assessed at baseline; 3-month follow up; 12-month follow up	Burden score reduced by 25.8 points on average	548 children, 294	Significant, p<0.05	City of Minneapolis MNLHH0149-06 Grantee Final Report
	Nights with symptoms in previous 2 weeks (Program's Tool)	Study group: baseline, 12-month follow up Comparison group: baseline, 14-month follow up	**Study group**: Mean of 2.8 at baseline, mean of 0.4 at 12-month follow up **Comparison group:** Mean of 2.9 at baseline, mean of 1.2 at 14-month follow up	Study group: 34 children, 34 Comparison group: 68 children, 68	Study group: Significant, p<0.001 Comparison group: Significant, p=0.005 Study vs Comparison: Not significant, p=0.376	Highline Communities Healthy Homes Program -- Breysse J, Dixon S, Gregory J, Philby M, Jacobs DE, Krieger J. Effect of weatherization combined with community health worker in-home education on asthma control. *Am J Public Health*. 2014; 104(1):57-64.
	Nighttime symptoms	Previous year at baseline, 3-month follow up	**Standard intervention:** 92% reported good control of asthma **Intensive intervention:** 89% reported good control of asthma	200 households, 179	N/A, no p value specified	Long Beach HHD Survey, CALHH0188-08 Grantee Final Report
	Had breathing problems related to asthma at night	Previous month; assessed at baseline and at follow up	23.1% reported at baseline, 21.4% reported at follow up	117 participants, 117	Not significant, p=0.824	Harris County TXLHH0179-08 Grantee Final Report

Asthma Indicator	Specific measure	Time Period Assessed	Change reported	Number Assessed at baseline, Number	Statistical Significance	Data Source

				Assessed at Follow-up	Reported	
Nighttime symptoms	Rating of child difficulty sleeping (5-point scale, 1=All of the time, 5=None of the time)	Previous month; assessed at Baseline and 6-month follow up	Mean of 4.09 at baseline, mean of 4.40 at 6-month follow up	216 children, 216	Significant, no p value specified	Esperanza CALHH0176-08 Grantee Final Report
	Woke up because of wheezing or tightness in chest or cough	Previous 6 months; assessed at baseline and 6-month follow up	Mean of 7.0 at baseline, mean of 2.8 at 6-month follow up	233 children, 159	Significance not specified, no p value specified	MI Dept. of Community Healthy Homes MILHH0163-08 Grantee Final Report
	Awaken at night due to coughing	Last 12 months; assessed at baseline and at (unspecified time) follow up	95 units reported at baseline, 60 reported at follow up (39% reduction)	113 families, 113	Significance not specified, no p value specified	Self Help MALHH0175-08 Grantee Final Report

Asthma Indicator	Specific measure	Time Period Assessed	Change reported	Number Assessed at baseline, Number Assessed at Follow-up	Statistical Significance Reported	Data Source
Limitations on Usual Activities	Child have to slow/stop play (Program Tool)	Past 14 days; assessed at baseline and 6 month follow-up	Mean of 3.98 (0-14) at baseline; mean of 1.63 (0-14) at follow-up	120 children, 99	Significant, no P value specified	Columbus Public Health 2014 HHD Survey responses
	Functional limitations (ITG – Program's own tool)	Time period not specified; assessed at baseline; 3-month follow up; 12-month follow up	Burden score reduced by 23.0 points on average	548 children, 294	Significant, $p<0.05$	City of Minneapolis MNLHH0149-06 Grantee Final Report
	Days of activity limited in previous 2 weeks (PT-Program's Tool)	**Study group**: baseline, 12-month follow up **Comparison group**: baseline, 14-month follow up	**Study group**: Mean of 3.2 at baseline, mean of 0.5 at 12-month follow up **Comparison group**: Mean of 2.5 at baseline, mean of 0.9 at 14-month follow up	**Study group**: 34 children, 34 **Comparison group**: 68 children, 68	**Study group**: Significant, $p<0.001$ **Comparison group**: Significant, $p=0.002$ **Study vs Comparison**: Not significant, $p=0.139$	Highline Communities Healthy Homes Program -- Breysse J, Dixon S, Gregory J, Philby M, Jacobs DE, Krieger J. Effect of weatherization combined with community health worker in-home education on asthma control. *Am J Public Health*. 2014; 104(1):57-64.
	Did not do hobbies or social activities because of asthma problems	Previous month; assessed at baseline and at follow up	16.7% reported at baseline, 17.6% reported at follow up	108 participants, 108	Not significant, $p=1.000$	Harris County TXLHH0179-08 Grantee Final Report

Asthma Indicator	Specific measure	Time Period Assessed	Change reported	Number Assessed at baseline, Number Assessed at Follow-up	Statistical Significance Reported	Data Source
Limitations on Usual Activities	Had to slow down or stop play or activities because of asthma, wheezing, tightness in chest, or cough	Previous 6 months; assessed at baseline and 6-month follow up	Mean of 10.4 at baseline, mean of 4.0 at 6-month follow up	233 children, 159	Significance not specified, no p value specified	MI Dept. of Community Healthy Homes MILHH0163-08 Grantee Final Report
	Coughing, wheezing or experiencing shortness of breath with exercise or activity and had to stop because of these symptoms	Last 12 months; assessed at baseline and at (unspecified time) follow up	92 units reported at baseline, 76 reported at follow up (17% reduction)	113 families, 113	Significance not specified, no p value specified	Self Help MALHH0175-08 Grantee Final Report

Asthma Indicator	Specific measure	Time Period Assessed	Change reported	Number Assessed at baseline, Number Assessed at Follow-up	Statistical Significance Reported	Data Source
Days Missed from School. Work, or Child care	School days missed	Time period not specified; assessed at baseline; 3-month follow up; 12-month follow up	Reduction from baseline to 12-month follow up, no data specified	548 children, 294	Not statistically significant, no P value specified	City of Minneapolis 2014 HHD Survey responses; also MNLHH0149-06 Grantee Final Report
	No school days missed, perfect attendance (Health Assessment Survey)	Past 6 months; assessed at baseline and 6-month follow up	62% increase in reporting perfect attendance from baseline to 6-month follow up	149 children, 149	N/A, no p value specified	Coalition to End Childhood Lead Poisoning 2014 HHD Survey responses; also MDLHH0160-07 Grantee Final Report
	No missed work days (Health Assessment Survey)	Past 6 months; assessed at baseline and 6-month follow up	88% increase in reporting never having to miss a day at work, from baseline to 6-month follow-up	149 children, 149	N/A, no p value specified	Coalition to End Childhood Lead Poisoning 2014 HHD Survey responses; also MDLHH0160-07 Grantee Final Report
	School days missed	Previous year assessed at baseline; 3-month follow up	**Standard intervention**: 31% stopped missing school days **Intensive intervention**: 57% stopped missing school days	200 households, 179	N/A, no p value specified	Long Beach HHD Survey; CALHH0188-08 Grantee Final Report
	Work days missed by caregiver	Previous year assessed at baseline; 3-month follow up	**Standard intervention**: 7.7% reported missing one or more days of work, a decrease of 64% from baseline **Intensive intervention**: 7.5% reported missing one or more days of work, a decrease of 62% from baseline	200 households, 179	N/A, no p value specified	Long Beach HHD Survey; CALHH0188-08 Grantee Final Report

Asthma Indicator	Specific measure	Time Period Assessed	Change reported	Number Assessed at baseline, Number Assessed at Follow-up	Statistical Significance Reported	Data Source
Days Missed from School. Work, or Child care	School days missed	Baseline, 6-month follow up	Children increased average attendance in school by 4.1 days	287 children, 287	N/A, no p value specified	Alameda County CALHH0150-06 Grantee Final Report
	Missed school or work because of asthma problems	Previous month; assessed at baseline and at follow up	15.8% reported at baseline, 12.3% reported at follow up	114 participants, 114	Not significant, p=0.481	Harris County TXLHH0179-08 Grantee Final Report
	Missed preschool or school because of asthma	Previous 6 months; assessed at baseline and 6-month follow up	Mean of 1.6 at baseline, mean of 1.0 at 6-month follow up	233 children, 159	Significance not specified, no p value specified	MI Dept. of Community Healthy Homes MILHH0163-08 Grantee Final Report
	Missed work for caregiver due to child's asthma	Previous 6 months; assessed at baseline and 6-month follow up	Mean of 0.48 at baseline, mean of 0.47 at 6-month follow up	233 children, 159	Significance not specified, no p value specified	MI Dept. of Community Healthy Homes MILHH0163-08 Grantee Final Report
	Missed school days	Previous month,; assessed at baseline and 6-month follow up	Mean of 1.64 at baseline, mean of 0.56 at 6-month follow up	156 families, 108	Significance not specified, no p value specified	Milwaukee WILHH0189-08 Grantee Final Report

Asthma Indicator	Specific measure	Time Period Assessed	Change reported	Number Assessed at baseline, Number Assessed at Follow-up	Statistical Significance Reported	Data Source
Other	Child Activity (100 point scale)	Past 4 week; assessed at baseline and 1 year follow-up	Improved from score of 84.9 to score of 93	172 children, 116	Significant, no P value specified	U Mass/Lowell 2014 HHD Survey responses; also MALHH0171-08 Grantee Final Report
	Child Emotional Health (100 point scale)	Past 4 week; assessed at baseline and 1 year follow-up	Improved from score of 67.9 to score of 88	172 children, 116	Significant, no P value specified	U Mass/Lowell 2014 HHD Survey responses; also MALHH0171-08 Grantee Final Report
	Family Activity (100 point scale)	Past 4 week; assessed at baseline and 1 year follow-up	Improved from score of 88.7 to score of 97.4	172 children, 116	Significant, no P value specified	U Mass/Lowell 2014 HHD Survey responses; also MALHH0171-08 Grantee Final Report
	Family Emotional Health (100 point scale)	Past 4 week; assessed at baseline and 1 year follow-up	Improved from score of 71.2 to score of 81.1	172 children, 116	Significant, no P value specified	U Mass/Lowell 2014 HHD Survey responses; also MALHH0171-08 Grantee Final Report
	Caretaker's quality of life (Pediatric Asthma Caregiver's Quality of Life Questionnaire)	**Study group**: baseline, 12-month follow up **Comparison group**: baseline, 14-month follow up	**Study group**: Mean of 5.1 at baseline, mean of 6.7 at 12-month follow up **Comparison group**: Mean of 5.3 at baseline, mean of 6.2 at 14-month follow up	**Study group**: 34 children, 34 **Comparison group**: 68 children, 68	**Study group**: Significant, p<0.001 **Comparison group**: Significant, p<0.001 **Study vs Comparison**: Significant, p=0.002	Highline Communities Healthy Homes Program -- 2014 HHD Survey responses; also Breysse J, Dixon S, Gregory J, Philby M, Jacobs DE, Krieger J. Effect of weatherization combined with community health worker in-home education on asthma control. *Am J Public Health*. 2014; 104(1):57-64.

Asthma Indicator	Specific measure	Time Period Assessed	Change reported	Number Assessed at baseline, Number Assessed at Follow-up	Statistical Significance Reported	Data Source
Other	Rating of child wheezing with a cold (5-point scale, 1=All of the time, 5=None of the time)	Previous month; assessed at Baseline and 6-month follow up	Mean of 4.44 at baseline, mean of 4.48 at 6-month follow up	213 children, 213	Not significant, no p value specified	Esperanza CALHH0176-08 Grantee Final Report
	Rating of child with a cold that won't go away (5-point scale, 1=All of the time, 5=None of the time	Previous month; assessed at Baseline and 6-month follow up	Mean of 4.47 at baseline, mean of 4.66 at 6-month follow up	214 children, 214	Significant, no p value specified	Esperanza CALHH0176-08 Grantee Final Report
	Rating of child with a cough (5-point scale, 1=All of the time, 5=None of the time)	Previous month; assessed at Baseline and 6-month follow up	Mean of 3.89 at baseline, mean of 4.08 at 6-month follow up	215 children, 215	Significant, no p value specified	Esperanza CALHH0176-08 Grantee Final Report
	Rating of a child wheezing without a cold (5-point scale, 1=All of the time, 5=None of the time)	Previous month; assessed at Baseline and 6-month follow up	Mean of 4.34 at baseline, mean of 4.61 at 6-month follow up	215 children, 215 children	Significant, no p value specified	Esperanza CALHH0176-08 Grantee Final Report
	Vacuum child's sleeping room (6 point scale)	At baseline and 6 month follow-up	Improved from mean 2.77 to 3.55	120 participants, 120	Significant, no P value specified	Columbus Public Health 2014 HHD Survey responses
	Vacuum entire house other than child's sleeping room (6 point scale)	At baseline and 6 month follow-up	Improved from mean 3.30 to 3.85	120 participants, 120	Significant, no P value specified	Columbus Public Health 2014 HHD Survey responses
	Put clean sheets on child's bed (6 point scale)	At baseline and 6 month follow-up	Improved from mean 2.37 to 2.82	120 participants, 120	Significant, no P value specified	Columbus Public Health 2014 HHD Survey responses

Asthma Indicator	Specific measure	Time Period Assessed	Change reported	Number Assessed at baseline, Number Assessed at Follow-up	Statistical Significance Reported	Data Source
Other	Use a HEPA vacuum cleaner (6 point scale)	At baseline and 6 month follow-up	Improved from mean 0.50 to 3.92	120 participants, 120	Significant, no P value specified	Columbus Public Health 2014 HHD Survey responses
	Vacuum upholstered furniture (6 point scale)	At baseline and 6 month follow-up	Improved from mean 1.04 to 2.16	120 participants, 120	Significant, no P value specified	Columbus Public Health 2014 HHD Survey responses
	Dust in child's sleeping room (6 point scale)	At baseline and 6 month follow-up	Improved from mean 1.93 to 2.67	120 participants, 120	Significant, no P value specified	Columbus Public Health 2014 HHD Survey responses
	Dust entire house other than child's sleeping room (6 point scale)	At baseline and 6 month follow-up	Improved from mean 1.97 to 2.73	120 participants, 120	Significant, no P value specified	Columbus Public Health 2014 HHD Survey responses
	Use candles or incense (6 point scale)	At baseline and 6 month follow-up	Improved from mean 1.73 to 0.75	120 participants, 120	Significant, no P value specified	Columbus Public Health 2014 HHD Survey responses
	Use vinegar and baking soda or another non-toxic method to clean the house (6 point scale)	At baseline and 6 month follow-up	Improved from mean 0.82 to 3.83	120 participants, 120	Significant, no P value specified	Columbus Public Health 2014 HHD Survey responses
	Wash child's stuff animals (6 point scale)	At baseline and 6 month follow-up	Improved from mean 0.65 to 1.00	120 participants, 120	Not significant, no P value specified	Columbus Public Health 2014 HHD Survey responses
	Clean drapes, curtains, and blinds (6 point scale)	At baseline and 6 month follow-up	Improved from mean 0.68 to 1.38	120 participants, 120	Significant, no P value specified	Columbus Public Health 2014 HHD Survey responses
	Mop bare floors (6 point scale)	At baseline and 6 month follow-up	Mean 3.61 at baseline; mean 3.60 at follow-up	120 participants, 120	Not significant, no P value specified	Columbus Public Health 2014 HHD Survey responses
	Treat home for roaches (6 point scale)	At baseline and 6 month follow-up	Improved from mean 0.23 to 0.32	120 participants, 120	Not significant, no P value specified	Columbus Public Health 2014 HHD Survey responses

Asthma Indicator	Specific measure	Time Period Assessed	Change reported	Number Assessed at baseline, Number Assessed at Follow-up	Statistical Significance Reported	Data Source
Other	Knowledge on how to control asthma triggers in home (pre- and post-knowledge test)	Baseline, 6-month follow up	72% increase in knowledge of how to control asthma triggers	253 homes, 253	N/A, no p value specified	Alameda County CALHH0150-06 Grantee Final Report
	Implement measures to improve conditions in home/reduce asthma triggers (Behavior Assessment Survey)	Baseline, 6-month follow up	99.9% reported making at least one behavioral change to reduce asthma symptoms	253 homes, 253	N/A, no p value specified	Alameda County CALHH0150-06 Grantee Final Report
	Exposure to cigarettes	No time specified; assessed at baseline and at (unspecified time) follow up	23 units reported at baseline, 17 units reported at follow up (26% reduction)	113 families, 113	Significance not specified, no p value specified	Self Help MALHH0175-08 Grantee Final Report
	Exposure to cockroaches	No time specified; assessed at Baseline, and at (unspecified time) follow up	8 units reported at baseline, 1 unit reported at follow up (86% reduction)	113 families, 113	Significance not specified, no p value specified	Self Help MALHH0175-08 Grantee Final Report
	Exposure to rodents	No time specified: assessed at Baseline and at (unspecified time) follow up	32 units reported at baseline, 20 units reported at follow up (38% reduction)	113 families, 113	Significance not specified, no p value specified	Self Help MALHH0175-08 Grantee Final Report
	Exposure to gas stove	No time specified: assessed at Baseline and at (unspecified time) follow up	43 units reported at baseline, 38 units reported at follow up (15% reduction)	113 families, 113	Significance not specified, no p value specified	Self Help MALHH0175-08 Grantee Final Report
	Exposure to a fireplace or wood-burning stove	No time specified: assessed at Baseline and at (unspecified time) follow up	19 units reported at baseline, 15 units reported at follow up (21% reduction)	113 families, 113	Significance not specified, no p value specified	Self Help MALHH0175-08 Grantee Final Report

Asthma Indicator	Specific measure	Time Period Assessed	Change reported	Number Assessed at baseline, Number Assessed at Follow-up	Statistical Significance Reported	Data Source
Other	Exposure to pets	No time specified: assessed at Baseline and at (unspecified time) follow up	37 units reported at baseline, 36 reported at follow up	113 families, 113	Significance not specified, no p value specified	Self Help MALHH0175-08 Grantee Final Report
	Health professionals who had given patient an asthma action plan	No time specified: assessed at Baseline and at (unspecified time) follow up	17 units reported at baseline, 59 reported at follow up (247% increase)	113 families, 113	Significance not specified, no p value specified	Self Help MALHH0175-08 Grantee Final Report
	Health professionals who had taught child or patient how to use a nebulizer properly, if they use one	No time specified: assessed at Baseline and at (unspecified time) follow up	81 units reported at baseline, 89 reported at follow up (10% increase)	113 families, 113	Significance not specified, no p value specified	Self Help MALHH0175-08 Grantee Final Report

APPENDIX 4: SURVEY INSTRUMENT

OMB Control No 2539-0024, expiration date 02/28/2017. This information is designed to provide information to HUD regarding the performance of the grantees that carried out the Healthy Homes Demonstration grant program, and to provide the Congress with status reports on the grants as required by Title X of the Housing and Community Development Act of 1992 (P.L. 102-550). Public reporting burden for this collection of information is estimated to be 16 hours per response. This collection does not require the retention of confidential or sensitive material. This information is also designed to provide timely information under the Federal Financial Accountability and Transparency Act of 2006 (P.L. 109-282), and the American Recovery and Reinvestment Act of 2009 (ARRA; P.L. 111-5). This agency may not collect this information, and you are not required to complete this form packet, unless it displays a currently valid OMB control number.

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Welcome Past and Current Healthy Homes Demonstration Grantees!

Form Approved, OMB Control No 2539-0024, Expiration Date 02/28/2017

The Healthy Homes Demonstration (HHD) grant program helps develop, demonstrate and promote cost-effective, preventive measures for identifying and correcting residential health and safety hazards.

Through the HHD grant program, HUD's Office of Lead Hazard Control and Healthy Homes (OLHCHH) has financed several healthy home demonstration projects over the years, but until now has not compiled or analyzed the projects and results. OLHCHH is interested in systematically collecting and reviewing information related to program design, recruitment and outreach, assessments, interventions, partnerships, staffing, evaluation, program costs, best practices and lessons learned. This will not only allow the Office to more easily identify and highlight unique features or successes of individual programs, but will also provide a mechanism for evaluating activities and outcomes for the HHD grant program as a whole.

You have been chosen to participate in this questionnaire because you are a past or current grantee whose program has one or more of these designing features:

- Diversity and intensity of interventions implemented
- Unique or robust partnerships
- Identification of best practices
- Monitoring and evaluation of health outcomes
- Strength of evaluation design
- Availability of cost data and/or cost analysis
- Availability of datasets for further analysis

Who should complete the questionnaire?
This questionnaire is being administered to past and current Healthy Homes Demonstration grantees. **We need one response PER program so each program/grantee should designate a single person* to complete the questionnaire.** You may need to collect information from other team or staff members, but responses should be compiled and entered by one person.

**Ideally this should be the person who is most familiar with the design, administration and evaluation of the activities implemented under your HHD Grant.*

What information will I need to complete the questionnaire?
The questionnaire will ask you to provide information about program design, recruitment and outreach, assessments, interventions, partnerships, staffing, evaluation, program costs, best practices and lessons learned. You may need to collect some of this information from other members of your team or staff. It will be helpful for you to review your reports and proposal as you complete this questionnaire. We advise you to look at the pdf version of the questionnaire that was provided and gather the information you will need before you complete the questionnaire online. **Please note that the questionnaire is designed to skip past questions that are not relevant to your program so you will not see all of the questions that are included in the pdf version of the questionnaire.** For instance, if you answer that your program did not do environmental sampling as part of this project, you will not see any of the questions on the page "Additional detail about environmental sampling". In general, questions on pages with titles that start with "Additional detail" will only be shown to grantees who have responded positively to a previous related question. More information about these skip patterns will be explained in the orientation webinar and in the document *Questionnaire_explanation of drop-downs and skip patterns.pdf* attached to your questionnaire invitation.

How long will the questionnaire take?
The questionnaire should take 50-120 minutes to complete online, depending on how many questions are relevant to your program, the length of your answers to open-ended questions and the amount of preparation you have done to gather needed information. Depending on how much data you need to assemble and the number of people who might be consulted, we estimate that you will need 5-10 hours of preparation. Some grantees may receive a request for a follow-up phone call if additional information is needed to clarify or expand upon responses. The total estimated time for preparing for and completing this questionnaire and any needed follow-up should not exceed 16 hours.

Can I complete the questionnaire in more than one session (e.g., save and return later)?
Yes. You can start to enter your answers, leave the questionnaire early, and then re-access the link to finish later. Note that you must use the link that was provided to your grantee program. **Each grantee program was provided a unique link so it is important that you only use the link that was sent to you from Healthy Housing Solutions.**

How will the information be used?
As noted above, the information collected will provide critical information about the impact and activities of the HHD grant program as a whole, while also making it easier to identify and highlight specific features of individual grantee programs. The information may be used to inform future decision-making about the program, to spread best practices and share learning with other HUD grantees, and/or to identify additional opportunities for collaboration and analysis.

General Information

1. Please select the name of your organization from the list of grantees below:

***2. Tell us a little about this project (response required):**

Title of project:

Project Director:

Project start date (mm/yyyy):

Project end date (mm/yyyy):

***3. Who is the best contact person if we need to follow-up for additional information about this project?**

Name*:

Organization & Title:

Address:

Address 2:

City/Town:

State:

ZIP:

Email Address*:

Phone Number*:

4. Please enter the information for a secondary contact (optional):

Name:

Email Address:

Phone Number:

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Targeting Individuals

5. Some programs target individuals for recruitment. Some focus on housing units. Many programs target both individuals and housing units.

Did your program target INDIVIDUALS?

Choose "yes" if your program did ANY targeted recruitment of individuals based on health conditions or characteristics of individuals. You will be asked about targeting of housing in a separate question.

◯ Yes

◯ No

Additional Detail About Recruitment of Individuals

You are seeing the questions on this page because you previously indicated that your program targeted individuals for recruitment.

6. Did your project target any of the following groups?

Please indicate if each group was the primary (main) or secondary focus of your recruitment efforts. Groups that were included but not the main focus of your recruitment efforts should be included as secondary targets. If the group was not a focus of your recruitment efforts, select not applicable. Select one in each row.

	Primary target	Secondary target	Not applicable
Low-income families	○	○	○
Minority families	○	○	○
Immigrant or refugee families	○	○	○
Families or individuals residing in a specific neighborhood	○	○	○
Families with children under the age of 1 year	○	○	○
Families with children under the age of 6 years	○	○	○
Families with children under the age of 18 years	○	○	○
Families with children with or at-risk for lead poisoning	○	○	○
Families or individuals with or at-risk for asthma	○	○	○
Families or individuals with or at-risk for injuries	○	○	○
Families or individuals with or at-risk for other conditions	○	○	○
Disabled residents	○	○	○
Seniors	○	○	○
Renters/tenants	○	○	○
Owner-occupants or owner-occupied units	○	○	○
Landlords/Rental property owners	○	○	○
Other (specify below)	○	○	○

Please specify what other groups you targeted:

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7. Please tell us about the number of individuals enrolled during the project period:

Number of individuals you planned to enroll (target number):	
Total number of occupants (not necessarily the sum of detailed counts below):	
Number of occupants under 6 years of age:	
Number of occupants between the ages of 6 and 17:	
Number of occupants between the ages of 18-64:	
Number of occupants 65+:	
Number of occupants with asthma:	

Targeting Housing Units

8. Did your program target HOUSING UNITS?

Choose "yes" if your program did ANY targeted recruitment of housing units or based on housing characteristics.

◯ Yes

◯ No

Additional Detail About Recruitment of Housing Units

You are seeing the questions on this page because you previously indicated that you targeted housing units for recruitment.

9. Did your project target any of the following types of housing units?

Please indicate if each type of housing was the primary (main) or secondary focus of your recruitment efforts. Types of housing that were included, but not the main focus of your recruitment efforts should be included as secondary targets. If the housing type was not a focus of your recruitment efforts, select "not applicable". Select one in each row.

	Primary target	Secondary target	Not applicable
Units located in a specific neighborhood or defined geographic boundary (e.g., census tract)	◯	◯	◯
Units built prior to 1950	◯	◯	◯
Units built prior to 1978	◯	◯	◯
Rental units	◯	◯	◯
Public housing units	◯	◯	◯
Single-family units	◯	◯	◯
Multi-family units	◯	◯	◯
Home-based child care	◯	◯	◯
Foster care	◯	◯	◯
Supportive housing (i.e., temporary shelters)	◯	◯	◯
Units located in Renewable Communities, Empowerment Zones or Enterprise Communities	◯	◯	◯
Units targeted for disaster mitigation	◯	◯	◯
Units participating in another health or housing program	◯	◯	◯
Other (specify below)	◯	◯	◯

Please specify what other types of housing were targeted:

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10. Please tell us about the number of units enrolled during the project period:

Number of housing units you planned to enroll:	
Total number of units (not necessarily the sum of detailed counts below):	
Number of owner-occupied units:	
Number of rental units:	
Number of vacant units:	
Number of units that were part of a multi-family building:	
Number of single-family units:	
Number of units built before 1940:	
Number of units built between 1940-1978:	
Number of units built after 1978:	

Recruitment Methods

11. Please rate the success of each method you used to recruit individuals or housing units for this project.

Select "not applicable" to indicate that you did not use a particular recruitment method.

	NOT successful	SOMEWHAT successful	VERY successful	Not applicable
Newspaper advertisement	◯	◯	◯	◯
Radio advertisement	◯	◯	◯	◯
TV advertisement	◯	◯	◯	◯
Mass transit advertisement (e.g., bus shelter/subway ad)	◯	◯	◯	◯
Internet (ads, postings on websites)	◯	◯	◯	◯
Facebook, Twitter or other social media	◯	◯	◯	◯
Mailings to property owners	◯	◯	◯	◯
Mailings or distribution of materials to organizations and/or community groups	◯	◯	◯	◯
Phone calls	◯	◯	◯	◯
Door-to-door recruitment	◯	◯	◯	◯
Referrals from health care providers	◯	◯	◯	◯
Referrals from immigrant/refugee centers	◯	◯	◯	◯
Referrals from other agencies/organizations	◯	◯	◯	◯
Community meetings, health fairs or other public events	◯	◯	◯	◯
Specialized 800 or other call-in number	◯	◯	◯	◯
Other (specify below)	◯	◯	◯	◯

Please specify what other types of methods you used to recruit clients:

12. Did you use incentives to recruit, enroll, or retain clients?

◯ Yes

◯ No

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Additional Detail About Incentives

You are seeing the questions on this page because your answer to a previous question indicated that you provided incentives to clients.

13. Did you use any of the following incentives to recruit, enroll or retain clients?

Select all that apply.

- ☐ Intervention(s) (e.g., installation or repair) subsidized or provided free of charge
- ☐ Vouchers for services (e.g., IPM, cleaning)
- ☐ Gift certificates
- ☐ Products/giveaways (e.g., cleaning supplies, CO/smoke detectors, mattress encasements, vacuum cleaner)
- ☐ Cash
- ☐ Other (please specify below)

Please describe what other incentive(s) you offered:

14. What was the average value of all incentives provided per household?

- ◯ Less than $100
- ◯ $100-$499
- ◯ $500-$999
- ◯ $1000 or more
- ◯ Not able to estimate

15. In your opinion:

	Yes	No	Unsure
Were the incentives you offered effective in recruiting clients?	◯	◯	◯
Were the incentives you offered effective in retaining clients (keeping clients enrolled)?	◯	◯	◯

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Recruitment and Enrollment Summary

16. Is there anything else you would like to tell us about your recruitment process or any successes or challenges you faced in recruiting and retaining clients?

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Partnerships

17. What types of community organizations, stakeholders and partners were engaged as part of this project?

Indicate whether each type of group was a partner, subcontractor or was not engaged as part of this project (not applicable). For this question, partners are defined as organizations, entities or individuals who took an active role in recruiting or providing services, but did not receive payment for services. Subcontractors are paid for their services. Select all that apply in each row.

	Partner	Subcontractor	Not applicable
Childcare providers	☐	☐	☐
Code enforcement	☐	☐	☐
Community-based health organization or coalition	☐	☐	☐
Community-based housing organization or coalition	☐	☐	☐
Early intervention/child education (e.g., Head Start)	☐	☐	☐
Evaluation consultant	☐	☐	☐
Faith-based organizations	☐	☐	☐
Healthcare providers (hospitals, clinics, physicians, nurses)	☐	☐	☐
Homeowners association	☐	☐	☐
K-12 Schools	☐	☐	☐
Landlord association	☐	☐	☐
Local business	☐	☐	☐
Managed care plans/health plans	☐	☐	☐
State or local health department	☐	☐	☐
State or local housing agency	☐	☐	☐
Other state or local agency	☐	☐	☐
Tenant association	☐	☐	☐
Translators (paid or volunteer translation services)	☐	☐	☐
University or academic partner	☐	☐	☐
Weatherization program	☐	☐	☐
WIC	☐	☐	☐
Other (please describe below)	☐	☐	☐

Please describe any other types of organizations/agencies engaged:

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18. How many partnerships were newly formed as a result of this project? Please note, for this question, the definition of partner does not include subcontractors.

- ◯ None
- ◯ 1-3
- ◯ 4-6
- ◯ More than 6
- ◯ Unsure

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19. Do you continue to work with one or more of these new partners?

- ◯ Yes
- ◯ No
- ◯ Unsure

Program Components

You will now be asked a series of questions about the individual components of your program, including assessment, educational and structural interventions and staffing.

For some questions you will be asked to enter a number (e.g., number of residents who completed an interview). In most cases, grantees should be able to enter the actual number requested. **However, if actual numbers are not available, we ask that you provide your best estimate.**

Visual Assessments of the Building or Unit

20. Did your program use VISUAL ASSESSMENTS?

- ◯ Yes
- ◯ No

Additional Detail About Visual Assessments

You are seeing the questions on this page because you indicated previously that your program used visual assessments.

21. You indicated that your program used visual assessments. How many visual assessments (including all follow-up assessments) were completed per housing unit?

Example: If your program completed a baseline assessment for every unit and between 1-4 follow-up assessments per unit, you would enter 2 for the minimum number of assessments and 5 for the maximum number of assessments below.

Average number of visual assessments per housing unit: ____

Minimum number of visual assessments per housing unit: ____

Maximum number of visual assessments per housing unit: ____

22. When did each assessment typically occur?

Use the reference point indicated in parentheses or enter NA if not applicable. If you conducted only two visual asessments, enter the same number of months next to second assessment and final asessment.

First (baseline) visual assessment (enter the number of **WEEKS** post enrollment): ____

Second visual assessment (enter the number of **MONTHS** after the first assessment): ____

Final visual assessment (enter the number of **MONTHS** after the first assessment): ____

23. How would you characterize your program's follow-up assessments?

◯ The follow-up visual assessment was identical in scope to the pre-intervention assessment.

◯ The follow-up visual assessment focused primarily on areas that were identified as problems or that received interventions as a result of the baseline assessment.

◯ The follow-up visual assessment was more extensive than the baseline assessment.

◯ No follow-up assessments were performed.

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24. Please indicate if each of the following focus areas was routinely addressed during the baseline visual assessment and/or during any of the follow-up assessments:

Select all that apply in each row.,

	Assessed at baseline	Always assessed at follow-up	Assessed as needed at follow-up	Not assessed
Carbon monoxide hazards (e.g., lack of working CO detector, malfunctioning appliances)	☐	☐	☐	☐
Environmental tobacco smoke (e.g., presence of ashtrays, smell of tobacco smoke)	☐	☐	☐	☐
Fire hazards (e.g., electrical hazards, no working smoke detector)	☐	☐	☐	☐
Housing code issues	☐	☐	☐	☐
Injury hazards (e.g., loose handrails, broken stair treads)	☐	☐	☐	☐
Inspection of appliances	☐	☐	☐	☐
Lead hazards (e.g., chipping or peeling paint)	☐	☐	☐	☐
Moisture problems	☐	☐	☐	☐
Pest infestations and/or pesticide use	☐	☐	☐	☐
Poisoning hazards (e.g., chemicals stored in home)	☐	☐	☐	☐
Presence of mold	☐	☐	☐	☐
Structural hazards (e.g., foundations, walls, roof)	☐	☐	☐	☐
Other (please specify below)	☐	☐	☐	☐

Please specify what other hazards were assessed with visual assessment:

25. How many housing units:

Completed a baseline visual assessment: ____

Completed a follow-up visual assessment: ____

26. Did your program use a standardized visual assessment tool to collect the same data for each housing unit? Please note a standardized visual assessment tool is any assessment protocol commonly used in the field.

◯ Yes

◯ No

Additional Detail About Standardized Visual Assessment Tools

You are seeing the questions on this page because you indicated that your program used a standardized tool to complete the visual assessment.

27. Did the program use or adapt any of the following standardized assessment tools?

Select all that apply.

- ☐ CEHRC Visual Assessment tool
- ☐ Cuyahoga County/Environmental Health Watch Home Moisture Audit
- ☐ EPA Asthma Home Environment Checklist
- ☐ Green and Healthy Homes Initiative assessment tool
- ☐ Healthy Homes Inspection Manual (assessment tool included)
- ☐ Healthy Homes Rating System (HHRS)
- ☐ Lead risk assessment/inspection according to EPA and HUD guidelines
- ☐ Master Home Environmentalist assessment tool
- ☐ Pediatric Environmental Home Assessment tool
- ☐ Program developed their own assessment tool (please describe below)
- ☐ Another standardized tool was used (please describe below)

Please describe any tools that were adapted or developed, or any tools used that are not listed above:

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Visual Assessments

28. Is there anything else you would like to tell us about the visual assessments your program completed?

Resident Interviews

29. Did your program conduct RESIDENT INTERVIEWS (including health assessments, pre/post questionnaires, etc.)?

- ◯ Yes
- ◯ No

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Additional Detail About Resident Interviews

You are seeing the questions on this page because you indicated previously that your program used resident interviews.

30. You indicated that your program used resident interviews to obtain information. How many times was each resident interviewed (including follow-up interviews)?

Example: If your program routinely completed a baseline and a single follow up interview, the typical number is 2; if your program routinely conducted a baseline interview and as well as other additional interviews before a final follow up interview, your number is 2 plus the number the additional interviews.

Typical number of interviews per resident: _____

31. When did each interview typically occur?

Use the reference point indicated in parentheses or enter NA if not applicable. If you conducted only two interviews, enter the same number of months next to second interview and final interview.

First (baseline) interview (enter the number of **WEEKS** post enrollment): _____

Second interview (enter the number of **MONTHS** after the first interview): _____

Final interview (enter the number of **MONTHS** after the first interview): _____

32. Please indicate if each of the following types of data were routinely collected during the baseline and/or follow-up interviews:

Select all that apply in each row.

	Baseline interview	Always assessed at follow-up	Assessed as needed at follow-up	Not assessed
Household/resident characteristics	☐	☐	☐	☐
History of household mobility (e.g. housing tenure)	☐	☐	☐	☐
Housing characteristics (e.g., age of housing)	☐	☐	☐	☐
Socioeconomic characteristics	☐	☐	☐	☐
Client concerns about housing conditions	☐	☐	☐	☐
Client's knowledge of focus areas	☐	☐	☐	☐
Allergies	☐	☐	☐	☐
Asthma	☐	☐	☐	☐
Elevated blood lead levels	☐	☐	☐	☐
Injuries	☐	☐	☐	☐
Other respiratory conditions	☐	☐	☐	☐
Poisonings	☐	☐	☐	☐
Behavioral information (e.g., cleaning, smoking, pets)	☐	☐	☐	☐
Healthcare utilization (e.g., ED or urgent care visits, hospitalizations)	☐	☐	☐	☐
Health-related absences from school or work	☐	☐	☐	☐
Quality of life indicators	☐	☐	☐	☐
Self-report of symptoms	☐	☐	☐	☐
Need for additional social or other services	☐	☐	☐	☐
Other (please specify below)	☐	☐	☐	☐

Please specify what other data was collected during the interviews:

33. How many residents:

Completed a baseline interview: ☐

Completed a follow-up interview: ☐

34. Is there anything else you would like to tell us about the interviews your program completed?

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35. Did your program do any ENVIRONMENTAL SAMPLING?

- ◯ Yes
- ◯ No

Environmental Sampling

You are seeing the questions on this page because you indicated previously that your program conducted environmental sampling.

36. FOR LEAD ONLY: Use the drop-down menu to indicate how many units were tested for LEAD using each of the following methods.

Choose "not applicable" for any samples you did not collect as part of this project.

	How many enrolled units were sampled with this method?
XRF	
Paint chip	
Dust sample	
Soil sample	
Water sample	
Other (specify below)	

Please specify what other types of lead samples were taken:

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37. FOR ALL OTHER SAMPLES: Use the drop-down menus to tell us about each of the other (NON-LEAD) types of environmental samples collected.

For any samples you did not collect as part of this project, choose not applicable in the first column (how many units) and leave the other columns blank.

	How many units were sampled?	Sampling method #1
Cockroach allergen		
Cat allergen		
Dog allergen		
Dust mite allergen		
Mouse allergen		
Molds		
Pesticide residue		
Carbon monoxide		
Radon		
Particulate matter		
Environmental tobacco smoke		
Total VOC		
Other indoor air quality		
Temperature		
Relative humidity		
Other (specify below)		

Please specify what other types of environmental samples were taken:

38. Is there anything else you would like to tell us about the environmental sampling completed as part of this project?

Biological Sampling

39. Did your program do any BIOLOGICAL SAMPLING?

- ◯ Yes
- ◯ No

Additional Detail About Biological Sampling

You are seeing the questions on this page because you previously indicated that your program collected biological samples.

40. You indicated that your program used biological sampling. Please indicate which of the following types of samples were collected at baseline and/or follow-up:

Select all that apply in each row.

	Sample taken at baseline	Follow-up sample taken	Not sampled
Blood lead levels	☐	☐	☐
Allergen testing - skin	☐	☐	☐
Allergen testing - blood	☐	☐	☐
Pulmonary function testing	☐	☐	☐
Saliva tests for exposure to hazards	☐	☐	☐

41. How many residents:

Completed a baseline sample: ☐

Completed a follow-up sample: ☐

Completed all scheduled follow-up samples: ☐

42. Is there anything else you would like to tell us about the biological sampling completed as part of this project?

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Assessments summary

43. On average, how long did it take to perform ALL baseline assessments for a typical housing unit or client (including visual assessments, interviews, environmental and biological sampling)?

- ◯ Less than 1 hour
- ◯ More than an hour but less than 2 hours
- ◯ More than 2 hours but less than 4 hours
- ◯ More than 4 hours, but less than a full day
- ◯ A full day
- ◯ More than a full day
- ◯ Not applicable

44. Did your program develop or use any electronic tools to COLLECT DATA IN THE FIELD (e.g., spec writing software, apps, electronic form, tablets)?

Select all that apply in each row.

	For visual assessment	For resident interviews	For construction specs or code issues	For other data collection activities
Yes, we used electronic data collection tools developed by someone else (describe below)	☐	☐	☐	☐
Yes, we developed and used our own electronic data collection tools (describe below)	☐	☐	☐	☐
No, we did not use any electronic data collection tools	☐	☐	☐	☐

Please describe the electronic data collection tools used or developed by your program:

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45. Did you provide any reports or written summary of your assessments to property owners/managers, residents or health care providers?

Select all that apply in each row.

	Provided to property owners/managers	Provided to residents	Provided to health care providers	Not provided/NA
Summary of visual assessment findings	☐	☐	☐	☐
Summary of health assessment findings	☐	☐	☐	☐
Summary of environmental sampling results	☐	☐	☐	☐
Summary of biological sampling results	☐	☐	☐	☐

Intervention Strategies

46. Did your program MAKE referrals TO any of the following types of organizations/agencies?

	Never	Occasionally	Routinely
Asthma program or coalition	◯	◯	◯
Healthcare provider or organization	◯	◯	◯
IPM program	◯	◯	◯
Lead program	◯	◯	◯
Social services (e.g., food stamps, WIC)	◯	◯	◯
Weatherization program	◯	◯	◯
Other (please specify)	◯	◯	◯

Please specify what other types of organizations:

47. Did your program RECEIVE referrals FROM any of the following types of organizations/agencies?

	Never	Occasionally	Routinely
Asthma program or coalition	◯	◯	◯
Healthcare provider or organization	◯	◯	◯
IPM program	◯	◯	◯
Lead program	◯	◯	◯
Social services (e.g., food stamps, WIC)	◯	◯	◯
Weatherization program	◯	◯	◯
Other (please specify)	◯	◯	◯

Please specify what other types of organizations:

48. What types of intervention strategies did your program use?

Select all that apply.

- ☐ Education of owners and/or residents
- ☐ Provided products/giveaways (e.g. mattress encasements, smoke detectors, cleaning supplies)
- ☐ Installed devices or housing components (e.g., installed smoke detector, flooring, air filter)
- ☐ Performed minor repairs or renovation (e.g., patched holes, sealed cracks)
- ☐ Performed major repairs or renovation (e.g., replaced HVAC system, repaired roof)
- ☐ Presentations to schools or community groups
- ☐ General public awareness or community outreach campaign

49. How would you characterize the intervention intensity?

Select one for each row. ***Select the intensity category that was most typically used for each category of intervention.***

MINOR: *Minor remediation efforts at a minimum include providing advice on recommended environmental changes to be performed by the members of the household, referrals to other programs such as smoking cessation, and providing low cost items such as cleaning supplies, mattress/pillow allergen impermeable covers, mouse traps or roach baits, cabinet or safety latches, CO or other alarms, radon test kits.*

MODERATE: *Moderate remediation include the provision of multiple low cost materials, and the active involvement of program staff. Activities in this category included the provision and fitting of mattress and pillow allergen impermeable covers, HEPA vacuums, small air filters and dehumidifiers, integrated pest management, professional cleaning services, small area(s) of paint stabilization, replacement of kitchen or bathroom exhaust fans, covering bare soil, window replacement for the purpose of weatherization, minor repairs of structural integrity (patching holes), installation of grab bars, safety latches, window guards, or alarms.*

MAJOR: *Major remediation efforts involve structural improvements to the home including carpet removal, replacement of ventilation systems, upgrades of heating and cooling systems, replacement of major appliances, soil removal, window replacement for the purposes of lead hazard control, large area(s) of paint stabilization or extensive repairs of structural integrity (roof, walls, and floors), installation of active radon mitigation systems.*

	Minor	Moderate	Major	Not applicable
Asthma trigger reduction or other asthma education	○	○	○	○
Carbon monoxide hazards	○	○	○	○
Housing code issues	○	○	○	○
Injury prevention and safety	○	○	○	○
Lead hazard control	○	○	○	○
Mold and moisture control	○	○	○	○
	○	○	○	○

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Pest control or integrated pest management	○	○	○	○
Radon	○	○	○	○
Structural hazards (e.g., foundations, walls, roof)	○	○	○	○
Weatherization/energy efficiency	○	○	○	○
Other indoor air quality	○	○	○	○
Other (please specify below)	○	○	○	○

Please specify what other healthy homes interventions your program implemented with HHD funding, including any additional information on the intensity of interventions performed by your program. IF YOUR PROGRAM PARTNERED WITH ANOTHER PROGRAM TO PERFORM INTERVENTIONS, AND THIS INCREASED THE INTENSITY OF THE INTERVENTION, PLEASE ALSO DESCRIBE THAT HERE.

50. How long, on average, did it take to complete ALL of the interventions for a single housing unit once they were started?

- ○ Same day
- ○ Within 1 week
- ○ Within 2 weeks
- ○ Within 1 month
- ○ Within 2 months
- ○ Longer than 2 months

51. Please use the drop-down menus in each column to indicate if you provided any of the following educational interventions to property owners or residents:

	Type of education provided to residents	Type of education provided to property owners
Lead poisoning prevention		
Asthma triggers		
Injury prevention		
Poisoning prevention		
Integrated pest management		
Mold and moisture prevention		
Carbon monoxide poisoning prevention		
Energy efficiency		
Fire safety		
Radon		
Environmental tobacco smoke/smoking cessation		
Medical management (of asthma or another condition)		
Other (specify below)		

Please specify what other topic areas were covered by your educational intervention:

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52. Did the educational interventions include any of the following?

Select all that apply.

- ☐ Hands-on demonstration (e.g., cleaning demonstration)
- ☐ Participants asked to repeat a hands-on demonstration
- ☐ Participants completed a pre-test to assess knowledge or skills (describe findings below)
- ☐ Participants completed a post-test to assess knowledge or skills (describe findings below)
- ☐ None of the above

Please describe the main findings of your evaluation of pre- and/or post test of knowledge and skills:

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Community Education and Outreach

The questions on this page are about general community education and outreach. These are community or neighborhood-level activities your program may have implemented to raise awareness about healthy homes. For the purpose of the questions on this page, community outreach does not include education provided as part of a home assessment or intervention or activities used exclusively to recruit clients (other questions in the survey will give you an opportunity to tell us about those activities).

53. What type of general community education and outreach methods did your program use as part of this project?

Indicate which methods were used by rating their effectiveness or select not applicable. If your program did not collect evaluation data on community outreach strategies, please respond by indicating how effective you felt each method was in raising awareness.

	NOT effective	SOMEWHAT effective	VERY effective	Not applicable
Door to door outreach	◯	◯	◯	◯
Mailings to organizations and/or community groups	◯	◯	◯	◯
Participation in health fairs	◯	◯	◯	◯
Broadcast media outreach	◯	◯	◯	◯
Mass transit advertisements	◯	◯	◯	◯
Internet ads and postings	◯	◯	◯	◯
Facebook, Twitter or other social media	◯	◯	◯	◯
Visits to primary care provider offices	◯	◯	◯	◯
Visits to community or parent groups	◯	◯	◯	◯
Other (please specify)	◯	◯	◯	◯

Please specify what other types of outreach methods were used:

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54. Please tell us a little about the number of individuals you reached through your community outreach/education efforts:

Number of individuals targeted:

Estimated number of individuals reached:

55. How did you evaluate your community outreach activities?

Select all that apply.

- [ ] We did not track or evaluate any of our community outreach activities
- [ ] Counts of those who were reached
- [ ] Demonstration and return demonstration of techniques (e.g., cleaning)
- [ ] Pre- and Post-tests of knowledge, behaviors or attitudes
- [ ] Surveys/evaluation
- [ ] Self-reported behavior change (or intent to change if signing a pledge)
- [ ] Other (please specify)

Please specify what other methods you used to evaluate your community outreach activities:

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Staffing

56. Did your program provide skills training to any of the following individuals or groups?
Select all that apply.

- ☐ Code inspectors
- ☐ Affordable housing professionals
- ☐ Grantee or partner staff
- ☐ Remodelers/contractors
- ☐ Property owners (non-residents)
- ☐ Residents/tenants
- ☐ Nurses
- ☐ Physicians
- ☐ Community-health workers (CHW) or Promotores(as)
- ☐ Other (please describe below):

Please describe what other types of staff were provided with skills training as part of this project:

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57. What type of staff conducted the assessment and intervention?

Select all that apply in each row.

SANITARIANS: Consider any staff member who holds the job description of sanitarian, licensed environmental health risk assesor, registered environmental health specialist or similar titles as sanitarians.

OTHER HOUSING PROFESSIONALS: Consider any staff member who holds the title code inspector, housing assessor or housing inspector, or who writes job specifications for construction as an other housing professional.

	Nurse/ Social worker	CHW/ Promotores	Other health educator	Sanitarian	Lead inspector	Other housing professional	Other	Not applicable
Visual assessment	☐	☐	☐	☐	☐	☐	☐	☐
Code inspection	☐	☐	☐	☐	☐	☐	☐	☐
Client interviews	☐	☐	☐	☐	☐	☐	☐	☐
Health assessment/interview	☐	☐	☐	☐	☐	☐	☐	☐
Housing education	☐	☐	☐	☐	☐	☐	☐	☐
Health education	☐	☐	☐	☐	☐	☐	☐	☐
Property owner education	☐	☐	☐	☐	☐	☐	☐	☐

If you checked other for any category, please specify what other types of staff were used:

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Evaluation

58. What type(s) of evaluation design were used to evaluate health and housing outcomes?

Select all that apply in each row and use the definitions below as guidance. We recognize that different NOFAs contained different instructions about the level of detail to include in an evaluation. There is no right or wrong answer to these questions.

Implementation/process evaluation: *Process evaluations might examine whether the activities are taking place, who is conducting the activities, who is reached through the activities, and whether sufficient inputs have been allocated or mobilized. Typically reported in counts or percents (e.g., percent or number of people reached, number or percent of units receiving pest control services, etc).*

Outcome/effectiveness evaluation:*Outcome evaluations assess progress related to the specific outcomes the program is designed to address. These evaluations are characterized by a pre/post design that measure the same condition or behavior before and after the intervention. Typical measures might include changes in attitudes or beliefs, changes in risk or health-protective behaviors, changes in the environment and changes in health outcomes.*

Quasi-experimental evaluation:*The program's outcome evaluation (defined above) also included a control or comparison group who did not receive the intervention during the evaluation timeframe. While an experimental design uses random assignment or other methods to ensure comparison among equivalent groups, the quasi-experiemental design allows for comparisons with groups between non-equivalent groups that are highly similar or equivalent on key factors only.*

Cost-benefit or cost-effectiveness evaluation:*The program systematically evaluated the costs and benefits of providing the intervention.*

	Implementation/ process	Outcome/ effectiveness	Quasi-experimental	Cost analysis	Other (describe below)	Not applicable
Housing conditions	☐	☐	☐	☐	☐	☐
Health outcomes	☐	☐	☐	☐	☐	☐
Behavior or knowledge among residents	☐	☐	☐	☐	☐	☐

Please describe what other type of evaluation you used:

59. Did your project include a control or comparison group?

- ☐ Yes (please describe below)
- ☐ No

Tell us more about your comparison or control group:

60. What quality assurance (QA) or quality control (QC) activities did you use?

Select all that apply.

- [ ] Data was double-entered into the study database.
- [ ] Range checks were programmed into the study database.
- [ ] Inter-rater reliability was determined for assessment tools.
- [ ] Questionnaires were pilot tested during development.
- [ ] QC samples were integrated into the biological/environmental sampling process.
- [ ] Collection of field data was observed at a specified frequency.
- [ ] Staff provided with refresher training at specified intervals.
- [ ] Frequent meetings with all project staff.
- [ ] Monitoring of interventions/work in progress.
- [ ] Other (please describe below)

Please describe any other QA/QC activities:

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Evaluation Results

61. For each of the following housing issues, please use the drop-down menu indicate if your evaluation showed an improvement between the baseline and final assessment across all housing units, a worsening, no change or if a change was not assessed. Use the second drop-down menu to indicate whether each change was statistically significant or whether no statistical test was applied.

If you did not measure a change in a particular condition, do not complete the second drop down menu.

	Evaluation findings: Change from baseline	Statistical significance
Asthma trigger reduction or other asthma education		
Carbon monoxide hazards		
Environmental tobacco smoke/smoking cessation		
Fire safety		
Housing code issues		
Injury prevention and safety		
Inspection of appliances		
Interventions to improve physical comfort		
Lead hazard control		
Mold and moisture control		
Pest control or integrated pest management		
Poisoning prevention		
Radon		
Structural hazards (e.g., foundations, walls, roof)		
Weatherization/energy efficiency		
Other indoor air quality		

62. Describe any key outcomes related to housing conditions or quality.

Include a detailed description of the outcomes (magnitude of the outcome, how and when it was measured, statistical significance).

63. Did your program track any health outcomes related to ASTHMA?

- ◯ Yes
- ◯ No

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Additional Detail About Asthma Outcomes

You are seeing the questions on this page because you previously indicated that your program tracked and reported on asthma outcomes.

64. Here are some commonly assessed asthma outcomes. Use the drop-down menus to indicate what timeframe was used to assess each outcome at baseline and at the final assessment. If you evaluated a change between baseline and final for any outcome, use the last drop-down menu to indicate if these outcomes improved, worsened or did not change.

For any items you did not assess, choose not assessed in the first column and leave the remaining columns blank.

	Timeframe asked about during baseline assessment	Timeframe asked about during final assessment	Evaluation findings: Change from baseline
Asthma hospitalizations			
Asthma ED/urgent care visits			
Days with worsening asthma			
Symptom-free days			
Nighttime symptoms			
Days missed of school, work or daycare			
Use of rescue inhaler			
Limitations on usual activity			

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65. Describe any key outcomes related to ASTHMA that are not captured in the question above.

Include a detailed description of the outcomes (magnitude of the outcome, how and when it was measured, statistical significance).

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Lead poisoning

66. Did your program track any health/case management outcomes related to LEAD POISONING?

- ◯ Yes
- ◯ No

Additional Detail About Lead Poisoning Outcomes

You are seeing the questions on this page because you previously indicated that your program tracked and reported on lead poisoning outcomes.

67. Please enter the number of children identified through the program:

Leave blank if unknown.

In need of screening:	
With elevated blood lead levels (5-9 ug/dl or above):	
With elevated blood lead levels (10 ug/dl or above):	
In need of case management services:	
Who needed to be temporarily relocated:	
Who needed to be permanently moved:	

68. Describe any key outcomes related to LEAD POISONING that are not captured in the question above.

Include a detailed description of the outcomes (magnitude of the outcome, how and when it was measured, statistical significance).

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Injury Prevention

69. Did your program track any health outcomes related to INJURY PREVENTION?

- ◯ Yes
- ◯ No

Additional Detail About Injury Prevention Outcomes

You are seeing the questions on this page because you previously indicated that your program tracked and reported on injury prevention outcomes.

70. Describe any key outcomes related to INJURY PREVENTION.

Include a detailed description of the outcomes (magnitude of the outcome, how and when it was measured, statistical significance).

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Other Health Outcomes

71. Describe any key outcomes related to OTHER HEALTH CONDITIONS (besides asthma, injury prevention or lead poisoning).

Identify the type of health condition and include a detailed description of the outcomes (magnitude of the outcome, how and when it was measured, statistical significance).

Publications and Datasets

72. Did you publish, publicize or present any of your findings?

Select all that apply and provide additional information about publications and presentations (websites, citations) in the box provided below.

- ☐ Conference poster
- ☐ Oral presentation at conference
- ☐ Presentation to elected officials or community group
- ☐ Published evaluation online (e.g., posted evaluation report on website)
- ☐ Peer-reviewed publication
- ☐ Community newsletter (print or online)
- ☐ Local TV or news broadcast
- ☐ Local radio broadcast
- ☐ Other
- ☐ None

Please provide the citation, website or other information for any publications or presentations related to this project:

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73. Would your program be able to share any of the following with HUD*?

Select all that apply.

- ☐ De-identified raw data (e.g., Excel file, Access database, SAS dataset, comma or tab-delimited file)
- ☐ De-identified cleaned data (e.g., Excel file, Access database, SAS dataset, comma or tab-delimited file)
- ☐ Aggregate data
- ☐ Data dictionary
- ☐ SPSS, SAS (statistical software) or other code used to analyze data
- ☐ Other documentation (e.g., summary of methods used)
- ☐ None of the above (explain your answer below):

Please briefly describe why data is not available for sharing with HUD:

*HUD is interested in obtaining grantee datasets to assess the feasibility of combining datasets for additional analysis.

***74. Who do we need to contact to find out more about the datasets and documentation available for sharing with HUD?**

Name:

Email Address:

Phone Number:

Institutional Review Board (IRB)

75. Did your program require IRB review or obtain IRB approval?

- ◯ No IRB review was required
- ◯ IRB review determined that the project was exempt
- ◯ Project was subject to expedited review
- ◯ Project was subject to full review
- ◯ Unsure

Any additional comments about IRB review:

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Cost information

76. Did your program track costs?

- ◯ Yes, we have detailed information about costs broken down by activity or component
- ◯ Yes, but not for all activities
- ◯ No, but we have estimated costs for all or some activities
- ◯ No, we have no cost information
- ◯ Unsure

Additional Detail About Costs Overall and by Program Component

You are seeing the questions on this page because you indicated that you had detailed cost information. You will be asked to provide the average, maximum and minimum per unit cost for different intervention components. **Near the end of the page you will be asked what costs were included in the numbers you provide (e.g, labor, supplies, equipment).**

OVERALL COST PER UNIT

77. Please estimate the average per unit cost for ALL physical intervention and clearance activities:

- ◯ Less than $500
- ◯ $500-$999
- ◯ $1000-$2499
- ◯ $2500-$4999
- ◯ $5000 or more
- ◯ Unsure or unable to estimate

78. Enter the minimum amount spent per unit and the maximum amount spent per unit to complete ALL physical intervention and clearance activities (the overall cost per unit in US dollars).

Minimum total cost per unit: ☐

Maximum total cost per unit: ☐

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PER UNIT COSTS FOR WEATHERIZATION & ENERGY EFFICIENCY ACTIVITIES

Weatherization and energy efficiency activities may include, but are not limited to:

Repairing/replacing windows
Installing weather stripping
Installing insulation
Sealing ducts
Servicing furnace/boiler/hot water heater
Other weatherization activities

79. Please estimate the average per unit cost for all WEATHERIZATION & ENERGY EFFICIENCY activities:

- ◯ Less than $500
- ◯ $500-$999
- ◯ $1000-$2499
- ◯ $2500-$4999
- ◯ $5000 or more
- ◯ Unsure or unable to estimate

80. Enter the minimum amount spent per unit and the maximum amount spent per unit to complete all WEATHERIZATION & ENERGY EFFICIENCY activities:

Minimum cost per unit for weatherization and energy efficiency activities: _____

Maximum cost per unit for weatherization and energy efficiency activities: _____

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PER UNIT COSTS FOR MOISTURE CONTROL ACTIVITIES

Moisture control activities may include, but are not limited to:

Fix roof leaks
Fix/clean gutters/downspouts
Fix plumbing/appliance leaks
Confirm dryer/bathroom fan/range hood vented to outside
Install dryer vented to outside
Install bathroom fan vented to outside
Install range hood fan vented to outside
Seal dirt crawl spaces in basement with plastic sheeting
Provide dehumidifier
Service furnace/air conditioner
Redirect ground or storm water runoff
Other moisture control activities

81. Please estimate the average per unit cost for all MOISTURE CONTROL activities:

- ◯ Less than $500
- ◯ $500-$999
- ◯ $1000-$2499
- ◯ $2500-$4999
- ◯ $5000 or more
- ◯ Unsure or unable to estimate

82. Enter the minimum amount spent per unit and the maximum amount spent per unit to complete all MOISTURE CONTROL activities:

Minimum cost per unit for moisture control activities: _____

Maximum cost per unit for moisture control activities: _____

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PER UNIT COSTS FOR LEAD HAZARD CONTROL ACTIVITIES

Lead hazard activities may include, but are not limited to:

Stabilize paint
Encapsulate paint
Strip paint from components (e.g., doors, windows)
Enclose walls
Replace components (e.g., doors, windows)
Make floor and window surfaces smooth and cleanable
Perform specialized cleaning of horizontal surfaces
Other lead hazard control activities

83. Please estimate the average per unit cost for all LEAD HAZARD CONTROL activities:

- ◯ Less than $500
- ◯ $500-$999
- ◯ $1000-$2499
- ◯ $2500-$4999
- ◯ $5000 or more
- ◯ Unsure or unable to estimate

84. Enter the minimum amount spent per unit and the maximum amount spent per unit to complete all LEAD HAZARD CONTROL activities:

Minimum cost per unit for lead hazard control activities: _____

Maximum cost per unit for lead hazard control activities: _____

PER UNIT COSTS FOR INJURY PREVENTION ACTIVITIES

Injury prevention activities may include, but are not limited to:

Provide smoke detector, CO alarm, window guards or cabinet locks
Install smoke detectors
Install carbon monoxide alarms
Install window guards
Install cabinet locks
Fix stair rails and stair treads
Provide night lights
Other

85. Please estimate the average per unit cost for all INJURY PREVENTION activities:

- ◯ Less than $500
- ◯ $500-$999
- ◯ $1000-$2499
- ◯ $2500-$4999
- ◯ $5000 or more
- ◯ Unsure or unable to estimate

86. Enter the minimum amount spent per unit and the maximum amount spent per unit to complete all INJURY PREVENTION activities:

Minimum cost per unit for injury prevention activities: _____

Maximum cost per unit for injury prevention activities: _____

PER UNIT COSTS FOR INDOOR AIR QUALITY AND ALLERGEN REDUCTION ACTIVITIES

Indoor air quality (IAQ) and allergen reduction activities may include, but are not limited to:

Make floor surfaces smooth and cleanable
Install air filtration devices
Perform cleaning
Provide mattress or pillow covers
Take steps to reduce environmental tobacco smoke in the home
Other

87. Please estimate the average per unit cost for all INDOOR AIR QUALITY & ALLERGEN REDUCTION activities:

- ◯ Less than $500
- ◯ $500-$999
- ◯ $1000-$2499
- ◯ $2500-$4999
- ◯ $5000 or more
- ◯ Unsure or unable to estimate

88. Enter the minimum amount spent per unit and the maximum amount spent per unit to complete all INDOOR AIR QUALITY & ALLERGEN REDUCTION activities:

Minimum cost per unit for IAQ and allergen reduction activities: _____

Maximum cost per unit for IAQ and allergen reduction activities: _____

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PER UNIT COSTS FOR INTEGRATED PEST MANAGEMENT (IPM) ACTIVITIES

Integrated pest management activities may include, but are not limited to:

Seal holes and cracks
Eliminate food sources
Use low-toxicity baits or gels
Vacuum
Conduct monitoring
Other

89. Please estimate the average per unit cost for all IPM activities:

- ◯ Less than $500
- ◯ $500-$999
- ◯ $1000-$2499
- ◯ $2500-$4999
- ◯ $5000 or more
- ◯ Unsure or unable to estimate

90. Enter the minimum amount spent per unit and the maximum amount spent per unit to complete all INTEGRATED PEST MANAGEMENT (IPM):

Minimum cost per unit for IPM activities: _____

Maximum cost per unit for IPM activities: _____

ADDITIONAL QUESTIONS

91. What was included in the costs (or estimated costs) you provided above?

Select all that apply in each row.

	Grant-funded	Donated, in-kind, leveraged or other funding	Not applicable
Labor	☐	☐	☐
Supplies	☐	☐	☐
Equipment	☐	☐	☐
Services (e.g., professional pest management services, professional cleaning)	☐	☐	☐
Outreach materials	☐	☐	☐
Travel (local travel only)	☐	☐	☐
Overhead/administrative/fringe/indirect costs	☐	☐	☐
Other (describe below)	☐	☐	☐

Please describe what other costs are included in your estimate. IF YOU ARE ABLE TO BREAK OUT STAFF OR OTHER COSTS ASSOCIATED WITH EDUCATIONAL OR FOLLOW UP EVALUATION VISITS, PLEASE DESCRIBE THESE HERE:

92. Did you conduct any type of formal cost analysis (e.g., cost-benefit, cost-effectiveness, ROI) for this project?

- ◯ Yes
- ◯ No
- ◯ Unsure

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Additional Detail About Overall Costs

You are seeing the questions on this page because you indicated that your program tracked some, but not all, costs. You will be asked to provide the average, maximum and minimum per unit cost for your program's interventions. Near the end of the page you will be asked what costs were included in the numbers you provide (e.g, labor, supplies, equipment).

93. Please estimate the average per unit cost for ALL physical intervention and clearance activities:

- ◯ Less than $500
- ◯ $500-$999
- ◯ $1000-$2499
- ◯ $2500-$4999
- ◯ $5000 or more
- ◯ Unsure or unable to estimate

94. Enter the minimum amount spent per unit and the maximum amount spent per unit to complete ALL physical intervention and clearance activities (the overall cost per unit).

Minimum total cost per unit: _____

Maximum total cost per unit: _____

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95. What was included in the costs (or estimated costs) you provided above?

Select all that apply in each row.

	Grant-funded	Donated, in-kind, leveraged or other funding	Not applicable
Labor	☐	☐	☐
Supplies	☐	☐	☐
Equipment	☐	☐	☐
Services (e.g., professional pest management services, professional cleaning)	☐	☐	☐
Outreach materials	☐	☐	☐
Travel (local travel only)	☐	☐	☐
Overhead/administrative/fringe/indirect costs	☐	☐	☐
Other (describe below)	☐	☐	☐

Please describe what other costs are included in your estimate. IF YOU ARE ABLE TO BREAK OUT STAFF OR OTHER COSTS ASSOCIATED WITH EDUCATIONAL OR FOLLOW UP EVALUATION VISITS, PLEASE DESCRIBE THESE HERE:

96. Did you conduct any type of formal cost analysis (e.g., cost-benefit, cost-effectiveness, ROI) for this project?

- ◯ Yes
- ◯ No
- ◯ Unsure

Additional Detail About Cost Analysis

You are seeing the questions on this page because you indicated that you conducted a cost analysis as part of this project.

97. Can you make any conclusions about the cost-effectiveness of your approach? Choose the best answer and then provide additional detail in the box provided.

- ◯ The approach was not cost-effective.
- ◯ The approach was cost-effective.
- ◯ We were not able to determine if the approach was cost-effective (inconclusive results).
- ◯ We have not finished our cost analysis.

Please provide additional information about your cost analysis:

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Challenges encountered

98. How frequently did you encounter the following challenges during the course of this project? ***Please check one option per row.***

	This was NOT a challenge.	This was SOMETIMES a challenge.	This was FREQUENTLY a challenge.
Cost constraints	◯	◯	◯
Obtaining reliable contractors	◯	◯	◯
Obtaining qualified contractors	◯	◯	◯
Obtaining consent of the property owner	◯	◯	◯
Meeting timeframes	◯	◯	◯
Getting into housing units	◯	◯	◯
Contractual issues	◯	◯	◯
Obtaining timely environmental review	◯	◯	◯
Getting landlords/homeowners to do work	◯	◯	◯
Relocating residents	◯	◯	◯
Working with residents whose first language is not English	◯	◯	◯
Residents fearful of repercussions from landlord	◯	◯	◯
Change in target area or population	◯	◯	◯
Other (specify below)	◯	◯	◯

Please specify what other types of challenges you encountered:

99. How did you overcome these challenges?

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100. Were there any challenges you couldn't overcome?

- ◯ Yes (describe below)
- ◯ No
- ◯ Unsure

Please describe any challenges you had difficulty in overcoming:

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Best Practices and Sustainability

101. What aspects of your program or approach do you think were strongest or most effective?

Select all that apply.

- ☐ Identifying high-risk target areas or populations
- ☐ Addressing obstacles to enrollment and participation
- ☐ Leveraging statutory, regulatory and enforcement authority
- ☐ Collaboration and partnerships
- ☐ Educational approaches
- ☐ Housing/structural interventions
- ☐ Evaluation
- ☐ Leveraging resources and funding
- ☐ Sustainability
- ☐ Other (please specify below)

Please specify what other aspects of your program you felt were particularly strong:

102. Are there any parts of your approach that you would identify as best practices or that you would recommend highly to a new grantee or program?

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103. What aspects of your project do you think were ineffective?

104. Did you develop or adapt any of the following for use in this program?

	Yes	No	Unsure
Visual assessment tool	◯	◯	◯
Client interview guide	◯	◯	◯
Educational materials	◯	◯	◯
Recruitment method	◯	◯	◯
Referral system	◯	◯	◯
Partnership	◯	◯	◯
Training curriculum	◯	◯	◯

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