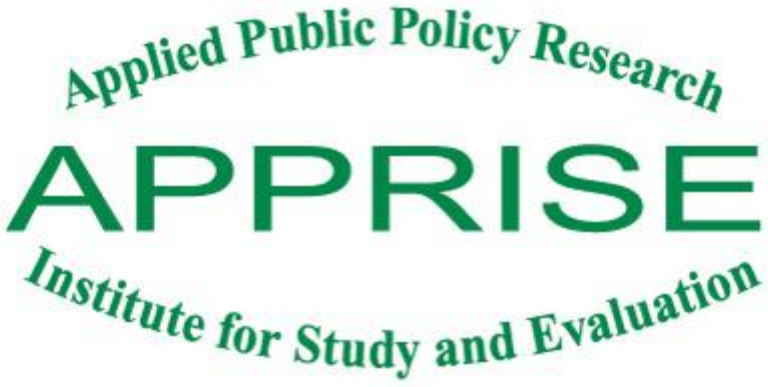

Ohio REACH

Interim Evaluation Report

July 2008

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Executive Summary

This report presents initial findings from the evaluation of The Ohio REACH Project. The Ohio REACH project targets additional resources to low income weatherization to go beyond energy use and energy bill reduction and more comprehensively address the needs of low-income households. This project sends energy professionals and health professionals in the homes of clients at the same time. Each professional is responsible for conducting an assessment of the needs in the home. Together, they prioritize the health and energy investments so that they complement each other, rather than work at cross purposes. The outcome of the program should be that the household energy systems are able to deliver the energy services needed by the home in a way that is energy efficient and healthy. The goal is to ensure that all households that have vulnerable individuals who receive services through the weatherization program will have adequate energy services and a healthier home environment after the completion of service delivery.

Evaluation

There are three primary goals of the evaluation.

1. Documentation: The evaluation documents how the program was implemented so that the pilot can be adapted and implemented as a new statewide approach to low-income energy assistance.

2. Impact measurement: The evaluation assesses the impact of the program on the health and safety of the home environment, the health and energy-related behaviors of the household members, and the health status of the household members.

3. Recommendations: The evaluation provides recommendations for statewide program implementation.

The evaluation consists of both process and impact evaluation research.

1. Process Evaluation Research: This research documents how the activities were implemented and develops a comprehensive understanding of barriers to implementation and potential modifications that would allow for improved execution or enhanced outcomes.

2. Outcome Evaluation Research: This research measures the impact of the services provided on the safety of the household environment and the health of the occupants.

Program Design

ODOD supports an extensive training program for Ohio weatherization providers. As part of that training, HWAP inspectors and work crews are trained to recognize conditions in the

home that may negatively impact the health of the occupants and health and safety issues that relate to combustion appliances. They are trained to modify weatherization measures to ensure that they do not introduce health problems as a result of the installation of energy efficiency measures in the home. However, these individuals do not have the comprehensive understanding of health issues that a health professional would.

This project sends energy professionals and health professionals in the homes of clients at the same time. Each professional is responsible for conducting an assessment of the needs in the home. Together, they prioritize the health and energy investments so that they complement each other, rather than work at cross purposes. The outcome of the program should be that the household energy systems are able to deliver the energy services needed by the home in a way that is energy efficient and healthy.

A second innovation of this project is the direct installation of measures that go beyond those health and safety measures that are allowable under the HWAP program. Under the existing DOE rules, HWAP can install some measures that enhance health and safety of the home. However, the primary focus of HWAP is saving energy; it cannot devote the level of attention to the indoor environment that is appropriate for these vulnerable households. In this pilot project, a health professional can explicitly look at the home in terms of its environmental risks and identify the key risks that need to be mitigated to create a healthy home.

The short term goal of the project is to enhance the health of vulnerable individuals served by the pilot program. This will be accomplished by assessing the health needs of individuals receiving weatherization services, prioritizing weatherization measures to best meet the energy and health needs of the households, funding supplemental measures that can reduce or eliminate environmental risks in the home, establishing a partnership with the household to take actions and develop behaviors to improve the health for vulnerable individuals, and leveraging other available resources to mitigate environmental health risks in the home.

The long term goal of this project is to develop a model for the Ohio energy programs that furnishes funding for supplemental measures to improve indoor environments for low-income households with vulnerable individuals, establishes protocols for weatherization measure selection and consumer education when services are delivered to homes that have vulnerable individuals, and establishes linkages between energy service delivery agencies and the agencies that can assist with environmental health risks for clients.

Program Implementation

This section describes some of the initial challenges, how the program was implemented, and initial program accomplishments.

Program Challenges

The Ohio REACH project was developed to test a specific program design, as described above. The project's focus was on delivering weatherization to vulnerable households and households with serious health conditions in a manner that more effectively addressed their needs. The key to the program design was a new model for service delivery with some additional funds for key health measures, rather than on a large additional funding method for addressing all potential issues in the home.

Program partners were not comfortable with this approach to service delivery. Based on their experience with other an HUD healthy home program, they felt it was not feasible to address issues in the home with this level of funding. Their previous program delivery was focused on comprehensively addressing the home health issues, and they would not approach this project as a new model for service delivery. To allow for greater costs of program measures, the REACH program dollars, with approval from HHS, were reprogrammed to increase the average home spending and reduce the number of treated homes.

Additionally, there is a concern that the REACH program is not always delivered in conjunction with HWAP, but sometimes as a post-HWAP service delivery system to provide additional services that HWAP could not provide. Conversations with managers at the lead agencies revealed that each household is treated in a somewhat different manner, so it is difficult to quantify the extent to which service delivery is implemented in this manner.

Service Delivery

The major issues that the agencies have found during the initial program visits include:

- Minor home repairs that lead to excess moisture
- Plumbing leaks
- Water leakage through basement walls
- Duct work
- Mold in the basement
- Wet insulation
- Gutters/downspouts that are improperly positioned
- Gutters are not properly installed or joints are not sealed and cause leaks that result in water saturating foundations and promoting mold and mildew growth.
- Lack of exhaust fans.
- Material in basements
- A need for air conditioning in homes with elderly household members. Some don't have air conditioning at all, and some need it repaired or replaced.
- Roofs that need to be fixed or replaced. They try to get those in need connected with roofing programs in the county. They have been successful with some of the clients, but not all. Those where they have not been successful, they are still looking for

programs that can help them (possibly through REACH if there is enough REACH funds at the end of the program.)

According to the lead agency managers, the REACH program is working well. It took some time for the agencies to develop the many partnerships that they needed, but they are now working quite well. The REACH program allows the agencies to help households in ways that other programs had not allowed. The managers expect to see changes in air quality, and resulting changes in occupant health, as result.

Program Accomplishments

While the REACH program faced many challenges and the service delivery was not implemented according to original plans, there are several accomplishments that should be recognized.

- *Service delivery*: By the end of June 2008, 42 homes received complete REACH services and an additional 53 homes received the initial REACH inspection.

- *Underserved households:* The lead agencies noted that the Ohio REACH program has allowed them to serve households that otherwise could not receive weatherization.

- *Program coordination:* The Cleveland Housing Network and the Breathing Association both worked diligently to leverage funds from all available programs and provide comprehensive services to REACH participants.

- *New partnerships:* In addition to leveraging funds, the REACH program has also leveraged human capital to help assist the households served by the program.

- *Capacity building:* Weatherization and health staff have worked together to conduct joint assessments of the needs of participating households. This cooperation has helped to build the skills of both groups.

Client Survey

The pre-treatment client survey showed that the households served by REACH have many health issues that are targeted by the program.

- 79 percent said that they felt there was a health issue in the home.
- 70 percent said they had seen mold in their home in the past year
- 65 percent said they had seen pests in their home in the past year
- 60 percent said someone in the home had asthma.
- 49 percent said someone in the home has chronic bronchitis or another lung disease.

I. Introduction

This report presents initial findings from the evaluation of The Ohio REACH Project. The Ohio REACH project targets additional resources to low income weatherization to go beyond energy use and energy bill reduction to more comprehensively address the needs of low-income households. The goal is to ensure that all of the households that have vulnerable individuals who receive services through the weatherization program will have adequate energy services and a healthier home environment after the completion of service delivery.

A. Background

The Residential Energy Assistance Challenge Option Program (REACH) was designed to pilot innovative strategies to reduce the energy vulnerability of LIHEAP-eligible households. The Ohio Department of Development was awarded a REACH grant to develop a more comprehensive approach to their weatherization program by assessing the needs of vulnerable households and providing services that are targeted to the individual household needs.

ODOD supports an extensive training program for Ohio weatherization providers. As part of that training, HWAP inspectors and work crews are trained to recognize conditions in the home that may negatively impact the health of the occupants and health and safety issues that relate to combustion appliances. They are trained to modify weatherization measures to ensure that they do not introduce health problems as a result of the installation of energy efficiency measures in the home. However, these individuals do not have the comprehensive understanding of health issues that a health professional would.

This project is designed to put energy professionals and health professionals in the homes of clients at the same time. Each professional is responsible for conducting an assessment of the needs in the home. Together, they prioritize the health and energy investments so that they complement each other, rather than work at cross purposes. The outcome of the program should be that the household energy systems are able to deliver the energy services needed by the home in a way that is energy efficient and healthy.

Under the existing DOE rules, HWAP can install some measures that enhance health and safety of the home. However, the primary focus of HWAP is saving energy; it cannot devote the level of attention to the indoor environment that is appropriate for these vulnerable households. In this pilot project, a health professional explicitly looks at the home in terms of its environmental risks and identifies the key risks that need to be mitigated to create a healthy home. Through this process, ODOD will develop better information on the performance of the installed measures in terms of concrete improvements in the health of individuals.

The short term goal of the project is to enhance the health of vulnerable individuals served by the pilot program. This is accomplished by assessing the health needs of individuals

receiving weatherization services, prioritizing weatherization measures to best meet the energy and health needs of the households, funding supplemental measures that can reduce or eliminate environmental risks in the home, establishing a partnership with the household to take actions and develop behaviors to improve the health for vulnerable individuals, and leveraging other available resources to mitigate environmental health risks in the home.

The long term goal of this project is to develop a model for the Ohio energy programs that furnishes funding for supplemental measures to improve indoor environments for low-income households with vulnerable individuals, establishes protocols for weatherization measure selection and consumer education when services are delivered to homes that have vulnerable individuals, and establishes linkages between energy service delivery agencies and the agencies that can assist with environmental health risks for clients.

B. Evaluation Objectives and Activities

There are three primary goals of the evaluation.

1. Documentation: The evaluation documents how the program was implemented so that the pilot can be adapted and implemented as a new statewide approach to low-income energy assistance.

2. Impact measurement: The evaluation assesses the impact of the program on the health and safety of the home environment, the health and energy-related behaviors of the household members, and the health status of the household members.

3. Recommendations: The evaluation provides recommendations for implementation of the program statewide.

The evaluation consists of both process and impact evaluation research.

1. Process Evaluation Research: This research documents how the activities were implemented and develops a comprehensive understanding of barriers to implementation and potential modifications that would allow for improved execution or enhanced outcomes. The Process Evaluation consists of the following activities.

    - **Administrative Interviews:** APPRISE conducted interviews with individuals at the state, CBO, and subcontractors to document the development of the program, the initial implementation of program services, and any barriers to initial program implementation.

    - **Document Review:** APPRISE reviewed program documents, including assessment materials and client education materials.

    - **Baseline Client Interviews:** APPRISE conducted interviews with clients prior to delivery of program services. These interviews document household conditions and

perceived health and safety problems in the household, client health conditions, and perceived need for program services.

- **Post Treatment Client Interviews:** APPRISE will conduct post-treatment interviews with 100 clients approximately one year after program services are delivered. These interviews will be conducted at the same time of year as the pre-treatment interviews, so that any changes in perceived home comfort or safety will not be related to the weather or time of year.

2. Outcome Evaluation Research: This research measures the impact of the services provided on the safety of the household environment and the health of the occupants. The Outcome Evaluation consists of the following activities.

   - **Pre/Post Weatherization Assessment:** APPRISE developed supplemental weatherization data collection forms to be used prior to service delivery and following service delivery. These forms collect information on the health and safety of the home. They include measures ambient levels of CO, levels of CO in the flue, presence of mold in the home, and other air quality measurements.

   - **Pre/Post Health Assessment:** APPRISE developed health assessment data collection forms to be used prior to service delivery and following service delivery. These forms collect information on additional health characteristics of the home and the occupants. They include issues such as smoking in the home, use of unsafe heating appliances, or control of unsafe indoor temperatures (those that are too hot or too cold for the health of the household members.)

   - **Pre/Post Client Assessment:** APPRISE will analyze the pre/post client assessment to determine if the treatments had an impact on clients' perceptions of home health and safety and client health.

C. Organization of the Report

Three sections follow this introduction.

- Section II – Program Design: This section describes the REACH program design.

- Section III – Program Implementation: This section describes the program implementation, obstacles that were faced, and modifications to the program design.

- Section IV – Customer Survey: This section presents results from the analysis of initial pre treatment customer survey data.

APPRISE prepared this report under contract to the Ohio Office of Community Services (OCS). OCS facilitated this research by furnishing data and information to APPRISE. Any errors or omissions in this report are the responsibility of APPRISE. Further, the statements,

findings, conclusions, and recommendations are solely those of analysts from APPRISE and do not necessarily reflect the views of OCS or the other program participants.

II. Program Design

This section describes the motivation for the project and the initial project design.

A. Ohio Energy Assistance Programs

The State of Ohio has four programs that help to mitigate the high cost of home energy for low-income households: LIHEAP, PIPP, HWAP, and EPP.

- LIHEAP – LIHEAP heating assistance benefits help low-income households with their home energy bills and LIHEAP crisis assistance helps low-income households maintain home energy services.

- PIPP – The Ohio Percentage of Income Payment program is a payment program that limits monthly payments for the main heating source to 10 percent of income and for the secondary heating source (which in most cases is electricity) to 5 percent of income.

- HWAP – The Ohio HWAP furnishes weatherization services to reduce energy usage and increase energy affordability and home comfort for low-income households.

- EPP – The Electric Partnership Program (EPP) furnishes electric baseload usage reduction services to PIPP participants in Ohio. It also provides weatherization services to PIPP participants who have a high heating or cooling load.

These programs illustrate the State's commitment to meeting the energy needs of low-income households in Ohio.

In addition, Ohio weatherization agencies also deliver the following programs:

- WarmChoice
- Vectren TEEM
- Housewarming
- Community Connections
- Other weatherization programs funded by Duke Energy Ohio, the Dayton Power & Light Company, Northeast Ohio Natural Gas, and Cleveland Public Power.

B. Unmet Needs

Ohio program managers have found that programs enhancements are needed to meet the needs of those low-income households that include individuals with chronic health conditions, young children, or frail older individuals. Inadequate heating and cooling systems, poor home ventilation systems, and other environmental risks can exacerbate the health conditions of vulnerable individuals, resulting in lost days at work and poor school

attendance, and increase the need for expensive health interventions. In a home with good functioning energy systems, the existing energy assistance and weatherization programs can provide a healthy and safe living environment. However, when these systems are not functioning properly, no amount of energy assistance can resolve the household's health problems.

The current weatherization protocol is not always able to address the specific conditions that may result in environmental health risks. In the Ohio HWAP, EPP and various utility funded programs, service providers furnish usage reduction services to low-income households. The weatherization services include installation of insulation, air infiltration measures, heating and cooling system duct measures, and other energy savings measures. The Weatherization Performance Standards used in all programs includes testing of combustion of appliances (e.g., furnaces, water heaters, and gas stoves) and resolution of performance issues. However, while service providers are alert to potential health risks in the home (e.g., mold, humidity, and other environmental hazards) the current measure selection guidelines place the highest priority on energy saving measures. In homes where one or more residents have chronic health conditions, weatherization procedures are sometimes modified (e.g., minimum ventilation guidelines are raised), but there has been only a limited opportunity to adapt the weatherization protocol to specifically address health issues in a systematic way. Similarly, the EPP has focused on cost-effective electric energy saving measures, with no systematic approach to addressing health issues in a home.

C. Target Population

The literature shows that three groups of individuals are particularly vulnerable to the environmental risks in the home.

- Chronic Health Conditions – Individuals with chronic health conditions are susceptible to environmental risks associated with both the temperature in the home and indoor air quality. Individuals with diabetes, heart disease, and other circulatory problems may be susceptible to risks even when the winter indoor temperatures are as high as 65°F. Individuals with asthma and other respiratory problems are affected by mold, dampness, and other indoor air quality problems. Health statistics show that diabetes and asthma are two chronic conditions that are increasing rapidly in the low-income population.

- Young Children – In addition to risks associated with the indoor air quality and temperature, young children are at risk for poisoning associated with lead paint. While nationally there have been significant reductions in the average level of lead detected in young children, there are still substantial risks in older cities like those found in Ohio.

- Frail Older Individuals – Frail, older individuals are particularly susceptible to risks associated with temperature extremes. Many studies have found that individuals over 65, and especially those over 75, are the most likely to suffer from morbidity and mortality due to exposure to extreme cold or extreme heat. This susceptibility may be

due to a reduced ability to feel or respond to changes in temperature, illnesses, and medications.[1]

The pilot program was designed to target homes with individuals under age six, individuals over age 65, and individuals that have been diagnosed with a chronic health problem, including: asthma, diabetes, and heart disease or stroke.

D. Geographic Areas

OCS aims to develop a statewide strategy for enhancing the energy assistance and weatherization programs to address the needs of vulnerable individuals. This pilot program focuses on two areas with particularly high needs: Cleveland and Franklin County.

Typical of many older cities in the Midwest, Cleveland has a large low-income population and an older housing stock. Over 23 percent of individuals in Cleveland have incomes below the poverty line and about 32 percent of children under the age 18 live in homes that have income below the poverty line. Over 80 percent of the homes in Cleveland were built prior to 1960, indicating that they are extremely vulnerable to lead paint risks. Cleveland is an Empowerment Zone community.

Franklin County includes both Columbus, the capital city of Ohio, and suburban and exurban areas outside Columbus. Columbus is an Empowerment Zone city with 17 percent of individuals in poverty and 23 percent of children under the age of 18 living in poverty. The homes in Columbus are newer, with about half of all units built since 1970. The inclusion of Columbus and Franklin County in the pilot was designed to help program managers to get a better understanding of how environmental risks compare between the older housing stock in Cleveland and the somewhat newer housing stock in Columbus and Franklin County.

[1] Kalkstein L and Valimont KM. "Climate Effects on Human Health," *Potential Effects of Future Climate Changes on Forests and Vegetation, Agriculture,Water Resources, and Human Health.* EPA Science and Advisory Committee Monograph #25389, 122-52, 1987. Basu R and Samet JM. "Relation Between Elevated Ambient Temperature and Mortality: A Review of the Epidemiologic Evidence," *Epidemiologic Reviews*, 24:190-202, 2002.

E. Logic Model

The project logic model summarizes the design framework.

Ohio REACH Logic Model

<table>
<tr><th>Assumptions</th><th>Activities</th><th>Immediate Outcomes</th><th>Intermediate Outcomes</th><th>Program Impacts</th></tr>
<tr><td>Unhealthy homes or unsafe indoor air quality can aggravate existing medical conditions.</td><td rowspan="2">Conduct pre-screening to select vulnerable households for assessment.</td><td rowspan="2">Clients with potential for health improvements to the home are identified.</td><td rowspan="6">The home uses less energy due to weatherization services.

Clients change their behavior in ways that reduce their energy usage.

Clients change their behavior in ways that positively impact the health of their homes.

Indoor air quality is improved.

Clients receive additional social services through the referrals (for example, lead abatement).</td><td rowspan="6">Clients are able to better afford their energy bills.

Clients' health improves.</td></tr>
<tr><td>Clients are more dependent on energy programs due to the use of breathing assistance machines.</td></tr>
<tr><td>Weatherization decisions can be better prioritized if health impacts are factored in.</td><td>Jointly conduct weatherization and healthy homes assessment.</td><td>A set of weatherization and healthy homes services that will most benefit the household are identified.</td></tr>
<tr><td>Relatively small health-related investments can yield large improvements in health.</td><td>Jointly deliver weatherization services and healthy homes services.</td><td>Households receive services that improve the energy efficiency and health of their homes.</td></tr>
<tr><td>Clients do not know how to reduce energy usage and create healthy homes.</td><td rowspan="2">Involve and educate the household as a partner in the home improvement process.</td><td rowspan="2">The householders take actions to reduce energy usage and increase the heath of their homes.</td></tr>
<tr><td>Households will be more invested if they are involved in the process.</td></tr>
<tr><td>Additional services are available for eligible clients.</td><td>Make referrals for additional services.</td><td>Households receive additional social services.</td></tr>
</table>

F. REACH Program Design

The Ohio Office of Community Service (OCS) is planning to devote additional LIHEAP resources to weatherization. OCS would like to target those additional resources in a way that addresses the more comprehensive needs of low-income households, rather than primarily focusing on the reduction of home energy bills. Specifically, OCS plans to develop procedures for using those funds to:

- Assess in-home environmental health risks for vulnerable individuals.
- Prioritize usage reduction measures in a way that best addresses both energy and health needs of vulnerable individuals.
- Supplement usage reduction measures with measures that enhance the health and safety of occupants and the home.
- Establish a partnership with vulnerable households to take actions that will help to mitigate environmental health risks in the home.
- Refer clients to other services that can improve the health of the home and the clients who live there.

The goal is to ensure that all of the households that have vulnerable individuals who receive services through HWAP and EPP will have adequate energy services after the completion of service delivery, including:

- Heating System – A heating system that delivers safe and effective heat to the home for a reasonable cost.
- Cooling System/Strategy – A cooling system and/or strategy that delivers safe and effective cooling to the home for a reasonable cost.
- Indoor Air Quality Strategy – A ventilation system and/or strategy that results in high indoor air quality during all seasons of the year.

Through this pilot program, ODOD is developing procedures for assessing the needs of vulnerable households, establishing protocols for prioritizing the delivery of energy efficiency services in the homes of vulnerable individuals, installing appropriate health measures in the homes of vulnerable individuals, making referrals to other available services that can improve the health of low-income households, and measuring the impact of the program on the health and well-being of targeted individuals. The pilot plan includes the following elements.

- Partnerships – The participating CBOs will establish a partnership between the local HEAP delivery agency, the local weatherization delivery agency (ies), and a local health agency to jointly deliver assessment and remediation services.

- Inspections – The service delivery partners will identify treated homes with vulnerable individuals and will conduct inspections of completed weatherization jobs to assess the environmental outcomes of existing weatherization procedures, identify missed opportunities for installation of remediation measures, and measure the household's understanding of energy practices that lead to healthy in-home environments.

- Prescreening – The service delivery partners will prescreen weatherization jobs to identify households with vulnerable individuals.

- Assessment – The service delivery partners will conduct a joint assessment of the energy needs of the home, the environmental risks in the home, and the health status of all household members.

- Prioritization – The service delivery partners will prioritize weatherization measures to select those that have the greatest positive impact on both energy usage and health.

- Supplemental Measures – The service delivery partners will identify additional measures that can enhance the health of the vulnerable individuals in the home.

- Household Contract – The service delivery partners will work with members of the household to identify actions the household can take to reduce environmental risks in the home and behaviors that will enhance the long-term health of household members.

- Referrals – The service delivery partners will make referrals to additional services that may further improve the health of the home.

- Assessment – The program evaluation will examine the specific outcomes of the program in terms of both the minimization of environmental risks and the change in health status for individuals in the household.

The results of the pilot will be used by OCS in developing the LIHEAP State Plan and the Weatherization Performance Standards, as well as in making funding decisions with respect to the allocation of federal LIHEAP and HWAP funds.

1. Partnerships

The CBOs will establish a partnership among the local HEAP delivery agency, the local weatherization delivery agency (ies), and a local health agency to jointly deliver assessment and remediation services to households with vulnerable individuals.

In Cleveland, the Cleveland Housing Network (CHN) is the lead agency. CHN is a broad-based housing organization that delivers LIHEAP, HWAP, Housewarming, Community Connections, and EPP to low-income households in Cleveland. CHN had already established a partnership with the Cleveland Health Department to furnish health assessment services and to supply funding for lead abatement funding for homes with children under the age of six.

In Franklin County, the Breathing Association is the lead agency. The Breathing Association delivers LIHEAP in Franklin County, as well as a host of health and wellness programs. The Breathing Association will partner with Ground Level Solutions, Columbus LEADS, and Mid-Ohio Regional Planning Commission, the weatherization providers in Franklin County.

CHN and the Breathing Association will collaborate during the program design and implementation phase of the project to share their insights on program approaches and to compare and contrast their findings. The output from this phase is a series of agreements and/or contracts with partner organizations.

2. Design Inspections and Measurement

The service delivery partners have extensive experience working in households with vulnerable individuals. However, this project makes two new resources available to the weatherization provider – a joint assessment with a health professional and supplemental funding for measure(s) that target the improvement of the indoor environment of the home.

In the first phase of this project, the service delivery partners will screen 25 homes with vulnerable individuals and conduct on-site inspections of completed weatherization jobs. [Note: It is estimated that about 25 percent of treated homes will have vulnerable individuals (i.e., children under 6, individuals over 65, or individuals with a chronic health condition).] The purposes of the inspections are to:

- Assess the environmental outcomes of existing weatherization procedures,
- Identify missed opportunities for installation of remediation measures that could improve the indoor environment, and
- Measure the household's knowledge of energy practices that lead to healthy in-home environments.

As a result of completing and reviewing the inspections, the service delivery partners will be able to finalize the design of the program, including:

- Targeting – Refine the program targeting to identify the households that are in the greatest need for program services.
- Weatherization Measure Priority – Revise the priority assigned to weatherization measures to account for both energy and health impacts.
- Supplemental Measure Priority – Identify the highest priority supplemental measures that can improve the indoor environment for households with vulnerable individuals, estimate the cost of installing each type of measure, and finalize the targeted expenditures for supplemental measures.

- Household Actions and Behaviors – Assess the most important actions that households can take to improve their environment and the behaviors that are likely to lead to the greatest improvements in health.

- Linkages – Estimate the eligibility of homes for additional services that are furnished by other organizations with other funding sources.

The output from this phase will be a final program protocol.

3. Prescreening

The service delivery partners will prescreen all weatherization jobs in the targeted geographic areas to identify households that have targeted individuals. During weatherization program intake, schedulers will use a special module to identify households who meet the demographic and/or health requirements for the program. Those households will be targeted for delivery of the pilot program services.

Statistics from the prescreening step will be kept to give more accurate estimates of the statewide number of households with vulnerable individuals.

The output from this phase will be screened cases for service delivery.

4. Service Delivery

The service delivery phase will include four activities:

- Joint Assessment – Joint health and energy assessment

- Service Delivery – Prioritization and delivery of weatherization measures

- Supplemental Measures – Prioritization and delivery of environmental measures

- Household Contract – Establishment of the household contract

Joint Assessment

An initial in-home visit will be conducted jointly by the weatherization inspector and the health assessment auditor.

- The health assessment auditor will identify the specific health conditions faced by individuals in the home, the specific environmental risks observed in the home (including behaviors), and the environmental risks that would be likely to aggravate the health conditions faced by the individuals in the home.

- The weatherization inspector will conduct the standard weatherization audit. That audit would be supplemented by a review of the specific environmental risks identified by the health auditor.

The output of the assessment is a list of potential energy measures and environmental mitigation measures for the home.

Energy Service Delivery

In most cases, weatherization providers have to prioritize among a number of valuable energy efficiency measures; there are far more measures that could be applied to a home than can be installed with the available budget. In addition, the weatherization provider also must assess whether there are measures that must be installed to maintain a safe environment for the household. Under the existing guidelines, certain measures are already identified as necessary, even though they do not directly contribute to a reduction in energy use. The first step in the service delivery process for the pilot is for the weatherization inspector to identify the measures that would be funded in the absence of the pilot program, and other measures that are needed but are not the highest priority for funding.

The list of proposed measures, including those that are needed but not selected, is then reviewed by the health auditor. The health auditor will propose revisions in the priority list, increasing the priority of those measures that improve the indoor environment and reducing the priority of those measures that might detract from the indoor environment. [This information should be recorded, as well.]

The final set of weatherization measures will be determined by the weatherization inspector. The measures will be delivered with HWAP funds.

Supplemental Measures

Once the final set of weatherization measures has been identified, the health auditor will identify and prioritize a set of supplemental health measures that are targeted to increase the indoor environment in the home. The highest priority will be given to those measures that specifically address the health issues for the subject household. Examples of health measures include:

- Window Preservation - Enables windows to function as intended, allowing for cross ventilation for cooling and air quality improvement.
- Installation of Central AC – For individuals who cannot suffer from the heat and cannot tolerate the fine particulate matter in “fresh air”
- Mold Remediation – Elimination of existing mold and remediation of the cause of mold growth
- Ventilation System – Installation of a ventilation system that improves air quality and reduces relative humidity
- Pest Control- Elimination of household pests that contribute to breathing problems.

The weatherization inspector will review the proposed supplemental measures and assess what energy impacts, if any, should be considered.

The final supplemental measure(s) will be selected by the health auditor. The pilot program funding will pay for the supplemental measures.

Household Contract

The health auditor will identify up to five health actions and/or behaviors that can be adopted by the client. These should include some one time measures (e.g., removal of dirty carpeting) and some on-going behaviors (e.g., stop smoking or smoke only outside the home).

The energy auditor will review the proposed health actions for energy consequences and will propose revisions.

The final household contact will be established by the health auditor with the household.

Summary

The output from this phase will be service delivery to 500 households.

5. Follow-Up and Inspection

The lead agency in each community will conduct follow-up with the client and inspection of a sample of homes.

Client Follow-Up

Each client served by the program will receive a follow-up call three months after service delivery. The call will serve several purposes, including: assessment of the performance of weatherization measures, assessment of the performance of supplemental health measures, follow-up on the actions and behaviors in the household contract, and tracking the impact of program linkages and referrals.

Post-Delivery Inspections

Following the model established in the program design inspections, the service delivery team for each CBO will conduct on-site inspections for 25 homes that received the program services. The inspection will be conducted one year after the completion of service delivery. Just as with the program design inspections, the inspections will include:

- Assess the environmental outcomes of existing weatherization procedures,
- Identify missed opportunities for installation of remediation measures that could improve the indoor environment, and

- Measure the household's knowledge of energy practices that lead to healthy in-home environments.

Summary

The output from this phase will be inspection reports for 50 jobs.

III. Program Implementation

This section of the report discusses how the program was implemented, the barriers that were faced during program implementation, and the program accomplishments. Service delivery statistics for jobs completed to date are also presented in this section.

A. Program Partners

The Cleveland Housing Network and the Breathing Association are the two lead service delivery agencies for the REACH grant. Each agency has partners that they work with for service delivery. Additionally, Ohio Partners for Affordable Energy (OPAE) was given the role of administration and coordination.

1. Cleveland Housing Network (CHN)

The Cleveland Housing Network developed agreements with two weatherization partners and two health departments. These agencies are as follows.

- Cuyahoga County Department of Development – This is the weatherization agency for Cuyahoga County.
- Summit County Department of Community and Economic Development – This is the weatherization agency for Summit County.
- Cuyahoga County Board of Health – This is the agency that provides the healthy homes assessments in Cuyahoga County.
- Akron City Health Department – This is the agency that provides the healthy homes assessments in Summit County.

2. Breathing Association (BA)

The Breathing Association developed agreements with three weatherization partners. Three weatherization agencies that provide services in Columbus are:

- Ground Level Solutions
- Mid-Ohio Regional Planning Commission (MORPC)
- Columbus-Franklin County Community Action Association

The Breathing Association has also partnered with many other organizations in this work. The following is a list of these other organizations.

- Economic and Community Development Institute
- OSU College of Nursing
- Central Ohio Diabetes Association
- Ohio State University, Division of Environmental Health Sciences

- Ohio Agency on Aging
- Ohio Environmental Protection Environmental Education
- Rebuilding Together Central Ohio
- Ohio Department of Health
- SERVPRO (fire and water damage cleanup)
- City of Columbus, Department of Development, Emergency Repair Program

B. Implementation Challenges

The Ohio REACH project was developed to test a specific program design, as described in the previous section of this report. The project's focus was on delivering weatherization to vulnerable households and households with serious health conditions in a manner that more effectively addressed their needs. The key to the program design was a new model for service delivery with some additional funds for key health measures, rather than on a large additional funding method for addressing all potential issues in the home.

While the Ohio REACH program goal is to meet the needs of the most vulnerable households, the goal of the pilot is to develop a model that can be implemented to enhance the weatherization program. Ohio's Office of Community Services does have the flexibility to use a portion of their LIHEAP funds to supplement weatherization measures. However, a model that requires thousands of dollars of additional measure funding is not feasible to continue after the conclusion of REACH, unless substantial leveraging is accomplished. Therefore, the REACH design focused on the reprioritizing of weatherization measures and the addition of some key health measures that could not be done through HWAP.

Given this program design, the original REACH budget allowed for an average of $1,500 per home with $500 allocated for the home health and energy audits and $1,000 allocated for additional health-related measures. With this budget, it was expected that approximately 500 homes would be served with the grant, with 250 served by each of the key agencies.

Program partners were not comfortable with this approach to service delivery. Based on their experience with another HUD healthy home program, they felt it was not feasible to address issues in the home with this level of funding. Their previous program delivery was focused on comprehensively addressing the home health issues, and they would not approach this project as a new model for service delivery. To allow for the higher cost of measures, the REACH program dollars, with approval from HHS, were reprogrammed to increase the average home spending to $3,000 and target a total of 250 treated homes (including the initial post-weatherization test jobs).

Additionally, there is a concern that the REACH program is not always delivered in conjunction with HWAP, but sometimes as a post-HWAP service delivery system to provide additional services that HWAP could not provide. Conversations with managers at the lead agencies revealed that each household is treated in a somewhat different manner, so it is difficult to quantify the extent to which service delivery is implemented in this manner.

C. Initial Service Delivery

The first step in the service delivery was for each of the two lead providers to visit a sample of homes that had received weatherization services and had individuals who might be at risk, including children and the elderly.

The Cleveland Housing Network (CHN) went out to 12 homes as part of this effort and found problems that were either not identified at the time of the WAP visit or that had issues that had come about since the weatherization service delivery. Some of the types of issues that were addressed included:

- An overflowed toilet that had not been cleaned up.
- Moisture issues that could be addressed by fixing gutters and downspouts, and regrading soil
- Severe breathing issues in the home that could be addressed with central air conditioning
- Environmental and mold cleaning
- Minor roof repairs
- Ventilation

The Breathing Association targeted homes that had an individual under six, over 65, or with chronic health problems. They assigned three homes to each of their three weatherization providers. They determined that the priorities in these homes were mold, moisture, and environmental cleanings. Other issues that they found in these homes included:

- Active leaks in the plumbing
- Floor drain with standing water
- Gutter and downspout replacement or addition
- Plastic storage containers and shelves to hold them to help prevent mold formation on cardboard boxes and other items stored in basements.
- Dehumidifiers
- Extermination
- Ramps and rails to help clients deal with physical limitations

After the conclusion of these homes, the agencies began full service delivery. The steps in the service delivery were the following:

1. The lead agency received obtained a list of households who were referred to REACH. These households were usually referred to the program because of health issues that were identified in the home. The referrals come from LIHEAP, HWAP, Housewarming, a plumbing program, and other community partners.

2. The lead agency determines if the client is a good candidate for REACH.

   The Breathing Association first determines that the household is income eligible for the program. They next look to see if the client has a chronic illness, such as COPD, asthma, a heart condition, or heart disease. They look for clients with conditions that have been identified by physicians as chronic. They prefer to have the condition associated with the home environment –respiratory or home mobility. So far, they have not had any problem identifying enough clients for the program. They have more referrals than they can handle. They are about half way toward their goal and have not done any advertising.

   CHN conducts an initial questionnaire with the client to determine if there are health issues in the home, to see if there are moisture issues that cannot be addressed with HWAP, and to determine if there are breathing problems in the household. HWAP and Housewarming are now asking some of these questions during their audits to provide CHN with the information needed to determine if the client should be treated by REACH.

3. The lead agency sent these households to APPRISE so that APPRISE could conduct a pre-treatment interview with the household. It was important that this interview be conduct prior to any service delivery. APPRISE would then notify the agency after the pre-treatment survey was completed.

4. A joint assessment of the home is conducted by the health and weatherization inspector. They consult and recommend measures for the home.

5. Services are delivered by the agencies and/or their subcontractors.

6. One year later, the home is revisited by the health inspector to assess the post treatment health and safety of the household.

The major issues that the agencies have found during these visits are similar to those found during the initial tests. These include:

- Minor home repairs that lead to excess moisture
- Plumbing leaks
- Water leakage through basement walls
- Duct work

- Mold in the basement
- Wet insulation
- Gutters/downspouts that are improperly positioned
- Gutters are not properly installed or joints are not sealed and cause leaks that result in water saturating foundations and promoting mold and mildew growth.
- Lack of exhaust fans.
- Material in basements
- A need for air conditioning in homes with elderly household members. Some don't have air conditioning at all, and some need it repaired or replaced.
- Roofs that need to be fixed or replaced. They try to get those in need connected with roofing programs in the county. They have been successful with some of the clients, but not all. Those where they have not been successful, they are still looking for programs that can help them (possibly through REACH if there is enough REACH funds at the end of the program.)

According to the lead agency managers, the REACH program is working well. It took some time for the agencies to develop the many partnerships that they needed, but they are now working quite well. The REACH program allows the agencies to help households in ways that other programs had not allowed. The managers expect to see changes in air quality, and resulting changes in occupant health, as result.

D. Program Accomplishments

While the REACH program faced many challenges and the service delivery was not implemented according to original plans, there are several accomplishments that should be recognized.

- *Underserved households:* The lead agencies noted that the Ohio REACH program has allowed them to serve households that otherwise could not receive weatherization. These clients had other issues that needed to be resolved prior to weatherization, but that weatherization funding would not cover. Therefore, the program has helped clients who otherwise could not have been helped.
- *Program coordination:* The Cleveland Housing Network and the Breathing Association both worked diligently to leverage funds from all available programs and provide comprehensive services to REACH participants. These are invaluable partnerships and this development work will continue to benefit clients who are served by these agencies even after the REACH project has been completed.

- CHN spent approximately $88,000 in REACH funds on program measures for the first 34 completed jobs. They were able to leverage an additional $150,000 from other programs that they worked with.

- The Breathing Association spent approximately $11,000 in REACH funds on program measures for the first 7 completed jobs. They leveraged approximately $28,000 in funding from other programs (not including $19,000 in HWAP funding) from other programs that they worked with.

- *New partnerships:* In addition to leveraging funds, the REACH program has also leveraged human capital to help assist the households served by the program. For example, the Breathing Association has been working with the Ohio State College of Nursing. Student nurses are working on the program for one of their clinical rotations, and graduated nurses are working on the program as part of their community rotation. These nurses provide important services to clients.

- *Capacity building:* Weatherization and health staff have worked together to conduct joint assessments of the needs of participating households. This cooperation has helped to build the skills of both groups. Weatherization staff, as a result, have increased knowledge of health issues in the home and the ways in which the weatherization program can be used to address those issues.

E. Service Delivery Statistics

Table III-1 displays the initial service delivery statistics for the Ohio REACH program through June 2008. The table shows that while only 42 homes have been completed, many other homes are currently in progress.

Table III-1
REACH Service Delivery Statistics
Through June 2008

	Initial HWAP/REACH Inspection	REACH Homes Completed
CHN	48	35
Breathing Association	47	7

IV. Client Survey

The goal of the Ohio REACH project is to improve the health and safety of the home and the occupants. Therefore, a pre/post survey was included in the evaluation plan to assess the impact of the program. To date, pre treatment client surveys were conducted with 80 program participants. Managers at the Breathing Association and at Cleveland Housing Network send APPRISE clients who are prescreened for services, APPRISE conducts the surveys, and then informs the agencies that the clients have been surveyed so that program service delivery can begin.

This section summarizes key findings from the 80 pre treatment client surveys. The survey instrument is contained in Appendix C of this report.

A. Healthy Home Basics

This section provides information on basic healthy home issues. Table IV-1 shows that 79 percent of the clients reported that they felt there was a condition in their home that was unsafe or unhealthy.

Table IV-1
Unsafe Condition Exists in Home

Do you believe there is any condition in your home that is unsafe or unhealthy?		
	Number	**Percent**
Yes	63	79%
No	15	19%
Don't know	2	3%

Respondents were asked to describe what they felt that was unhealthy in their home. Half of the respondents said that there was mold in the home, nine percent said the home was drafty, and five percent said there was a problem with the heating equipment. Others reported that there were leaks, drainage problems, problems with the roof, humidity issues, or dust.

Table IV-2
Unsafe Condition in the Home

What do you feel is unhealthy in your home?		
	Number	**Percent**
Mold	39	50%
Drafty home	7	9%
Heating equipment	4	5%
Leaks	3	4%

What do you feel is unhealthy in your home?		
	Number	**Percent**
Drainage	3	4%
Roof	2	3%
Humidity	1	1%
Dust	1	1%
Other	2	3%
Don't know	1	1%
None	15	19%

Respondents were also asked about several behaviors that could lead to an unhealthy home environment. Many of the households reported that they did have behaviors that could be altered to lead to a healthier home. These included:

- 21 percent said that someone smokes inside the home.
- 58 percent said that they don't use a bathroom fan when showering.
- 60 percent said that they don't use a kitchen exhaust when cooking.
- 3 percent said that they warm up the car in an attached garage.
- 34 percent said that they use their kitchen stove or oven for heating.

Table IV-3
Unhealthy Home Practices

	Number	**Percent**
Smoke inside the house	17	21%
Do not use bathroom fan when showering (or do not have fan in bathroom)	46	58%
Do not use kitchen exhaust fan when cooking (or do not have fan)	48	60%
Warm up car in attached garage	2	3%
Used kitchen stove or oven to heat home in past year	27	34%

B. Common Household Problems

Respondents were asked whether they have seen mold in their home in the past year. Seventy percent said that they had seen mold. Thirteen percent said they had seen mold in their kitchen, 46 percent in their bathroom, and 50 percent in their basement.

Table IV-4
Mold in the Home

	Number	**Percent**
Seen mold in home in the past year	56	70%

	Number	Percent
Kitchen	10	13%
Bathroom	37	46%
Basement	40	50%

Respondents were asked whether they had seen pests in their home in the past year. Sixty-five said that they had seen pests, 46 percent said that they used baits or poison, and 21 percent said that the poison was still in the home.

Table IV-5
Pests in the Home

	Number	Percent
Seen pests in home in the past year	52	65%
Used baits/poison	37	46%
Poison still in the home	17	21%

The survey included questions about the respondents' perception of the home humidity level. About one third said that the home was too humid in the summer and about one third said that the home was too dry in the summer. About one fifth said the home was too humid in the winter and about one third said that the home was too dry in the winter.

Table IV-6
Home Humidity

	Too Moist	Too Dry	Just Right	Don't Know
Summer	30%	30%	23%	16%
Winter	19%	34%	31%	16%

C. Health Issues

Respondents were also asked about health issues for the individuals in their home. Table IV-7 shows that 60 percent reported that someone in the home has asthma and 30 percent reported that someone went to the emergency room in the past year because of the asthma.

Table IV-7
Asthma

	Number	Percent
Someone in the home has asthma	48	60%
Went to doctor for asthma in past year	42	53%
Went to emergency room for asthma in past year	24	30%

Table IV-8 shows that allergies are also a common problem in these households. Three quarters of the respondents reported that someone in the home has allergies and 58 percent said that someone takes medicine for allergies. Additionally, 76 percent said that someone in the home always seems to have a cold, runny nose, wheezing, coughing, burning eyes, or headaches.

Table IV-8
Allergies

	Number	Percent
Someone in the home has allergies	60	75%
Takes medicine for allergies	46	58%
Someone always seems to have cold, runny nose, wheezing, coughing, burning eyes, or headaches	61	76%

Table IV-9 shows that about half of the respondents reported that someone in the home has chronic bronchitis or another lung disease, and about one quarter said that someone in the households went to the emergency room in the past year because of bronchitis or lung disease.

Table IV-9
Bronchitis

	Number	Percent
Someone in home has chronic bronchitis or another lung disease	39	49%
Went to emergency room in past year because of bronchitis or lung disease	21	26%

When asked for an overall health rating of the household members, five percent said they were very healthy, 41 percent said that they were somewhat healthy, 39 percent said that they were somewhat unhealthy, and 15 percent said that they were very unhealthy.

Table IV-10
Health Rating

How do you rate the health of your household members overall		
	Number	Percent
Very healthy	4	5%
Somewhat healthy	33	41%
Somewhat unhealthy	31	39%
Very unhealthy	12	15%

D. Home Comfort

Respondents home comfort ratings are shown in Table IV-11. The table shows that 14 percent said that their home was very comfortable, 55 percent said it was somewhat comfortable, 23 percent said it was somewhat uncomfortable, and 8 percent said it was very uncomfortable.

Table IV-11
Home Comfort

How do you rate the comfort of your home?		
	Number	**Percent**
Very comfortable	11	14%
Somewhat comfortable	44	55%
Somewhat uncomfortable	18	23%
Very uncomfortable	6	8%
Don't Know	1	1%

Table IV-12 shows that 75 percent said that their home is drafty in the winter, 28 percent said that the heating system does not heat the home to a comfortable temperature, and 43 percent said that the home was uncomfortably cold in the past year.

Table IV-12
Winter Comfort

	Number	**Percent**
Drafty in the winter	60	75%
Heating system does not heat home to comfortable temperature	22	28%
Home was uncomfortably cold in past year	34	43%

While most respondents reported that they have air conditioners, many reported that they are uncomfortable in the summer as well. Twenty-nine percent said that their air conditioner does not cool their home to a comfortable temperature and 39 percent said that their home was uncomfortably warm in the past year.

Table IV-13
Summer Comfort

	Number	**Percent**
Have air conditioner	66	83%
Air conditioner does not cool home to comfortable	23	29%

	Number	Percent
temperature		
Home was uncomfortably warm in past year	31	39%

Appendix A. Weatherization Summary

CLIENT NAME:	
PHONE NUMBER:	ZIP CODE:
START DATE:	COMPLETE DATE:
AUDITOR:	
TOTAL COST (=LABOR+MATERIAL):	
TOTAL LABOR COST:	
TOTAL MATERIAL COST:	
TOTAL REACH COST:	

	WEATHERIZATION MEASURES					
		No	Yes	Funded		
		1	2	REACH	WAP	OTHER
	AIR SEALING					
AS1	General house caulking and weatherstripping (e.g. doors, windows)	☐	☐	☐	☐	☐
AS2	House air sealing emphasizing bypasses – leaks identified without blower door	☐	☐	☐	☐	☐
AS3	House air sealing emphasizing bypasses – leaks identified with blower door	☐	☐	☐	☐	☐
AS4	Duct sealing and repair	☐	☐	☐	☐	☐
AS5	Other non-window non-door air sealing work	☐	☐	☐	☐	☐
	INSULATION					
INSUL6	Attic insulation	☐	☐	☐	☐	☐
INSUL7	Wall insulation	☐	☐	☐	☐	☐
INSUL8	Floor insulation	☐	☐	☐	☐	☐
INSUL9	Duct insulation	☐	☐	☐	☐	☐
INSUL10	Other insulation	☐	☐	☐	☐	☐
	SPACE HEATING SYSTEMS					
SH11	11. New space heating system	☐	☐	☐	☐	☐
SH12	12. Space heating system repair	☐	☐	☐	☐	☐
SH13	13. Space heating system tune-up	☐	☐	☐	☐	☐
	AIR CONDITIONING					
AC14	14. New window air conditioner	☐	☐	☐	☐	☐
AC15	15. New central air conditioner	☐	☐	☐	☐	☐
AC16	16. Air conditioner repair	☐	☐	☐	☐	☐
AC17	17. Air conditioner recharge/tune-up	☐	☐	☐	☐	☐
AC18	18. Ceiling or whole-house fan installation	☐	☐	☐	☐	☐
	VENTILATION					
VENT19	19. Exhaust fan in bathroom	☐	☐	☐	☐	☐
VENT20	20. Exhaust fan in kitchen	☐	☐	☐	☐	☐
VENT21	21. Whole house ventilation system	☐	☐	☐	☐	☐
VENT22	22. Other ventilation system improvements	☐	☐	☐	☐	☐
	HVAC ACCESSORIES					
HVAC23	23. New programmable thermostat	☐	☐	☐	☐	☐
HAVC24	24. New standard thermostat	☐	☐	☐	☐	☐
HVAC25	25. Standard air filter	☐	☐	☐	☐	☐
HVAC26	26. HEPA air filter	☐	☐	☐	☐	☐
HVAC27	27. Other HVAC accessories	☐	☐	☐	☐	☐

	WEATHERIZATION MEASURES					
		No	Yes	Funded		
		1	2	REACH	WAP	OTHER
	WATER HEATING SYSTEM					
WH28	28. New water heater	☐	☐	☐	☐	☐
WH29	29. Water heating system repair	☐	☐	☐	☐	☐
WH30	30. Water heater tank insulation wrap	☐	☐	☐	☐	☐
WH31	31. Pipe insulation	☐	☐	☐	☐	☐
WH32	32. Water heater temperature reduction	☐	☐	☐	☐	☐
WH33	33. Other water heating system measure	☐	☐	☐	☐	☐
	OTHER BASELOADS					
BASE34	34. Indoor lighting	☐	☐	☐	☐	☐
BASE35	35. Outdoor lighting	☐	☐	☐	☐	☐
BASE36	36. Refrigerator	☐	☐	☐	☐	☐
BASE37	37. Other baseload measures – specify _____	☐	☐	☐	☐	☐
	OTHER HEALTH AND SAFETY					
HS38	38. Smoke alarm	☐	☐	☐	☐	☐
HS39	39. CO monitor	☐	☐	☐	☐	☐
HS40	40. Attic ventiliation	☐	☐	☐	☐	☐
HS41	41. Roof repair	☐	☐	☐	☐	☐
HS42	42. Wall repair	☐	☐	☐	☐	☐
HS43	43. Floor repair	☐	☐	☐	☐	☐
HS44	44. Foundation repair	☐	☐	☐	☐	☐
HS45	45. Ground vapor barrier	☐	☐	☐	☐	☐
HS46	46. Gutter or downspout repair	☐	☐	☐	☐	☐
HS47	47. Grading of lot	☐	☐	☐	☐	☐
HS48	48. Plumbing repair	☐	☐	☐	☐	☐
HS49	49. Sewer repair	☐	☐	☐	☐	☐
HS50	50. Electrical repair	☐	☐	☐	☐	☐
HS51	51. Stair repair	☐	☐	☐	☐	☐
HS52	52. Grab bar in bathroom	☐	☐	☐	☐	☐
HS53	53. Non skid material in bathtub	☐	☐	☐	☐	☐
HS54	54. Metal chimney liner	☐	☐	☐	☐	☐
HS55	55. Lead abatement	☐	☐	☐	☐	☐
HS56	56. Asbestos containment	☐	☐	☐	☐	☐
HS57	57. Removal or safe storage of household poisons	☐	☐	☐	☐	☐
HS58	58. Pest extermination	☐	☐	☐	☐	☐
HS59	59. Environmental cleaning	☐	☐	☐	☐	☐
HS60	60. Other Health and Safety – specify _____	☐	☐	☐	☐	☐

Appendix B. Pre/Post Client Assessment

CLIENT NAME:					☐ PRE	☐ POST
CLIENT PHONE NUMBER:		CLIENT ZIP CODE:				
DATE:						
AUDITOR:						
Demographics						
Sex	☐ Male	☐ Female				
Marital	☐ Married	☐ Single				
Disability	☐ Yes	☐ No				
Education	☐ 0-8	☐ 9-12	☐ HS Grad/GED	☐ 12+	☐ College Degree	
Employed	☐ Full time	☐ Part time	☐ Student	☐ Unemployed	☐ Retired	
# children 5 or under						
# children 18 or under						
# 60 or older						
# with disability						
Family Type	☐ Male S/P	☐ Female S/P	☐ Two Parent	☐ Couple	☐ Single	☐ Other
Housing						
Age of Home						
Housing	☐ Rent	☐ Own	☐ Subsidized	☐ Other		
Dwelling Type	☐ Single Family	☐ 2-4 Units	☐ 5+ Units			
# Floors in Home						
Home Type	☐ Slab	☐ Crawl space	☐ Basement - block	☐ Basement - stone	☐ Basement - concrete	
Primary Heating Fuel	☐ Natural Gas	☐ Electricity	☐ Fuel Oil	☐ Propane	☐ Other _____	
Dwelling Condition	☐ Excellent	☐ Good	☐ Average	☐ Below average	☐ Poor	

	CLIENT KNOWLEDGE AND BEHAVIOR			
		No	Yes	Comments
		1	2	
HOMESMOKE	1. Do you allow smoking in your home?	☐	☐	
EXHAUST_BATH	2. Do you use your bathroom exhaust fan when showering or bathing?	☐	☐	
EXHAUST_KITCHEN	3. Do you use your kitchen exhaust fan when using your stove?	☐	☐	
FILTER	4. Do you change your furnace filter?	☐	☐	
FILTER_OFTEN	If yes, how often ☐ Every 3 months ☐ Every 6 months		☐ Once per year	☐ Less than once per year
		No	Yes	
UNVENTED	5. Do you use unvented gas or kerosene space heaters?	☐	☐	
FIREPLACE	6. Do you use a fireplace?	☐	☐	
STOVE	7. Do you use your kitchen stove or oven to provide heat?	☐	☐	
GRILL	8. Do you use charcoal grills inside your home?	☐	☐	
GARAGE	9. Do you warm up your car inside your garage?	☐	☐	

	CLIENT HOME CONDITIONS			
		No	Yes	Comments
		1	2	
ILL_HOT	1. Did you become ill in the past year because your home was too hot and you could not cool it?	☐	☐	
ILL_COLD	2. Did you become ill in the past year because your home was too cold and you could not heat it?	☐	☐	
TEMP	3. Did you keep your home at a temperature that you felt was unsafe or unhealthy in the past year?	☐	☐	
MOLD	4. Have you seen mold in your home in the past year?	☐	☐	
MOLD_RATE	If yes, rate ☐ minor ☐ significant ☐ severe			
MOLD_WHERE	If yes, where was the mold seen?			
PESTS	5. Have you seen pests in your home in the past year?	☐	☐	
PESTS_RATE	If yes, rate ☐ minor ☐ significant ☐ severe			
BASE_DRY	6. Is your basement dry?	☐	☐	
BASE_FLOOD	7. Does your basement flood?	☐	☐	
HUMIDIFIERS	8. Do you use humidifiers?	☐	☐	
DEHUMIDIFIERS	9. Do you use dehumidifiers?	☐	☐	

	CLIENT HEALTH			
		No	Yes	Comments
		1	2	
ASTHMA	1. Does anyone in the home have asthma?	☐	☐	
ASTHMA_NUM	If yes, how many attacks has the person with the worst case had in the past month?			Number ____
ALLERGIES	2. Does anyone in the home have allergies?	☐	☐	
ALLERGY_MED	If yes, has allergy medication been used in the past month?	☐	☐	
LUNG	3. Does anyone in the home have chronic bronchitis or another lung disease?	☐	☐	
LUNG_MED	If yes, has any medication been used to treat these conditions in the past month?	☐	☐	
DISEASE1	4. Does anyone in the home have heart disease or diabetes or has had a stroke?	☐	☐	
PROBLEM1	5. Does anyone in the home always seem to have a cold, a runny nose, wheezing, coughing, burning eyes, or headaches?	☐	☐	
MED	6. Has anyone in the home had difficulty getting needed medications? (Breathing Assoc. Only)	☐	☐	
DIAGNOSIS	7. What diagnoses have household members received from their doctors?			

TESTING RESULTS					
	Level	Comments			
1. Ambient CO					
2. Furnace flue CO					
3.Water heater CO					
4.Gas leak	CHECK BOX:	☐ none	☐ minor	☐ significant	☐ severe
5. Mold	CHECK BOX:	☐ none	☐ minor	☐ significant	☐ severe
6. Humidity - ambient					
7. Humidity - floor					
8. Humidity - walls					
9. Home temperature					
10. Peeling paint	CHECK BOX:	☐ none	☐ minor	☐ significant	☐ severe

	CLIENT SUMMARY				
	Have client rate on a scale from 1-4 (highest to lowest)	Excellent	Good	Satisfactory	Unsatisfactory
		1	2	3	4
WINTER_COMFORT	1. Comfort of your home in the winter	☐	☐	☐	☐
SUMMER_COMFORT	2. Comfort of your home in the summer	☐	☐	☐	☐
AIR_QUALITY	3. Home air quality	☐	☐	☐	☐
HEALTH	4. Household member health	☐	☐	☐	☐

Appendix C. Pre Treatment Client Survey

OHIO REACH Baseline Survey Instrument

Client Name _____
Client Phone_____
Client Zipcode_____
Survey Date _____

Introduction:
Hello. My name is (INTERVIEWER) and I'm calling from APPRISE in Princeton, New Jersey. I'm calling for (NAME) regarding the Ohio Weatherization Assistance Program. You are scheduled to receive services this week.

IF (NAME) IS NOT AVAILABLE TO SPEAK, ASK a)

a) When can I call back to speak with (NAME)? _____
{Interviewer Note: Write date and time for callback.}

IF (NAME) IS NOT ABLE TO SPEAK, ASK b):

b) Is there another person in the home who is familiar with the program and household?
{Interviewer Note: If answer is yes, proceed to interview this person.}

IF (NAME) IS AVAILABLE TO SPEAK, BEGIN SURVEY NOW.

A. Introduction

A1. How did you find out about the Weatherization Assistance Program?

01 COMMUNITY AGENCY
02 LIHEAP
03 FRIEND OR RELATIVE
04 CHURCH
05 OTHER _____
97 DON'T KNOW
98 REFUSED

A2. Why did you apply for the Weatherization Assistance Program?

01 REDUCE ENERGY BILLS/USAGE
02 MAKE HOME MORE COMFORTABLE
03 RECEIVE FREE SERVICES
04 OTHER _____
97 DON'T KNOW
98 REFUSED

B. Healthy Home Basics

B1. Do you believe that there is any condition in your home that is unsafe or unhealthy?

01 YES
02 NO
97 DON'T KNOW
98 REFUSED

(Ask B2 if B1=01, YES)
B2. What do you feel is unhealthy in your home?

01 HEATING EQUIPMENT
02 MOLD
03 PESTS
04 SMOKING
05 DRAFTY
06 OTHER _____
97 DON'T KNOW
98 REFUSED

B3. Does anyone smoke inside the house?

01 YES
02 NO
97 DON'T KNOW
98 REFUSED

B4. Do you use your bathroom exhaust fan when you are showering or bathing?

01 YES
02 NO
03 DO NOT HAVE A BATHROOM EXHAUST FAN
97 DON'T KNOW
98 REFUSED

B5. Do you use your kitchen exhaust fan when you are cooking?

01 YES
02 NO
03 DO NOT HAVE A KITCHEN EXHAUST FAN
97 DON'T KNOW
98 REFUSED

B6. Do you have a garage that is attached to your home?

01 YES
02 NO
97 DON'T KNOW
98 REFUSED

(Ask B7 IF B6=01, YES)
B7. Do you warm up your car in the garage?

01 YES
02 NO
97 DON'T KNOW
98 REFUSED

B8. Have you used your kitchen stove or oven to heat your home in the past year?

01 YES
02 NO
97 DON'T KNOW
98 REFUSED

C. Common Household Problems

C1. Have you seen mold in your home in the past year?

01 YES
02 NO
97 DON'T KNOW
98 REFUSED

(Ask C2-C6 if C1=01, YES)
C2. Have you seen mold in the kitchen?

01 YES
02 NO
97 DON'T KNOW
98 REFUSED

C3. Have you seen mold in the bathroom?

01 YES
02 NO
97 DON'T KNOW
98 REFUSED

C4. Have you seen mold in the basement?

01 YES
02 NO
97 DON'T KNOW
98 REFUSED

C5. Where else have you seen mold?

01 LIVING ROOM
02 DINING ROOM
03 HALLWAY
04 PORCH
05 BASEMENT
06 OTHER _____
97 DON'T KNOW
98 REFUSED

C6. What have you done about the mold?

01 NOTHING
02 CLEANED WITH BLEACH
03 CLEANED WITH MOLD REMOVER
04 OTHER _____
97 DON'T KNOW
98 REFUSED

C7. Have you seen pests (cockroaches, ants, mice, rats…) in your home in the past year?

01 YES
02 NO
97 DON'T KNOW
98 REFUSED

(ASK C8 if C7=01, YES)
C8. What have you done about the pests?

01 NOTHING
02 USED BAIT/POISON
03 HIRED AN EXTERMINATOR
97 DON'T KNOW
98 REFUSED

(ASK C9 if C8=02, BAIT/POISON)
C9. Is the bait/poison still in the home?

01 YES
02 NO
97 DON'T KNOW
98 REFUSED

C10. Does your home seem too moist, too dry, or just right in the summer?

01 TOO MOIST
02 TOO DRY
03 JUST RIGHT
97 DON'T KNOW
98 REFUSED

C11. Does your home seem too moist, too dry, or just right in the winter?

01 TOO MOIST
02 TOO DRY
03 JUST RIGHT
97 DON'T KNOW
98 REFUSED

C12. Do you check the humidity level in your home?

01 YES
02 NO
97 DON'T KNOW
98 REFUSED

C13. What do you think is a safe home humidity level?

01 <30%
02 30-50%
03 >50%
97 DON'T KNOW
98 REFUSED

D. Health Issues

D1. Does anyone in the home have asthma?

01 YES
02 NO
97 DON'T KNOW
98 REFUSED

(Ask D2-D3 if D1=1, YES)
D2. Has anyone in the home gone to the doctor for the asthma in the past year?

01 YES
02 NO
97 DON'T KNOW
98 REFUSED

D3. Has anyone in the home gone to the emergency room for asthma in the past year?
01 YES
02 NO
97 DON'T KNOW
98 REFUSED

D4. Does anyone in the home have allergies?
01 YES
02 NO
97 DON'T KNOW
98 REFUSED

(Ask D5 if D4=01, YES)
D5. Does anyone in the home take medicine for the allergies?
01 YES
02 NO
97 DON'T KNOW
98 REFUSED

D6. Does anyone in the home have chronic bronchitis or another lung disease?
01 YES
02 NO
97 DON'T KNOW
98 REFUSED

(ASK D7 IF D6=1, YES)
D7. Has anyone in the home gone to the emergency room in the past year because of chronic bronchitis or lung disease?
01 YES
02 NO
97 DON'T KNOW
98 REFUSED

D8. Does anyone in the home always seem to have a cold, a runny nose, wheezing, coughing, burning eyes, or headaches?
01 YES
02 NO
97 DON'T KNOW
98 REFUSED

E. Home and General Comfort and Health

E1. How do you rate the comfort of your home?

01 VERY COMFORTABLE
02 SOMEWHAT COMFORTABLE
03 SOMEWHAT UNCOMFORTABLE
04 VERY UNCOMFORTABLE
97 DON'T KNOW
98 REFUSED

E2. Is your home drafty in the winter?

01 YES
02 NO
97 DON'T KNOW
98 REFUSED

(Ask E3 if E2=01, YES)
E3. How drafty is your home in the winter?

01 EXTREMELY DRAFTY
02 SOMEWHAT DRAFTY
03 NOT VERY DRAFTY
97 DON'T KNOW
98 REFUSED

E4. What temperature do you keep you home in the winter when you are doing things around the house?

01 TEMPERATURE _____
97 DON'T KNOW
98 REFUSED

E5. Does your heating system heat your home to a comfortable temperature?

01 YES
02 NO
97 DON'T KNOW
98 REFUSED

E6. Was there any time in the past year that your home was uncomfortably cold and you could not afford to heat it?
01 YES
02 NO
97 DON'T KNOW
98 REFUSED

E7. Do you have an air conditioner?

01 YES
02 NO
97 DON'T KNOW
98 REFUSED

(Ask E8 if E7=01, YES)
E8. Do you have a central air conditioner, or a window or wall air conditioner?

01 CENRTAL AIR CONDITIONER
02 WINDOW AIR CONDITIONER
03 WALL AIR CONDITIONER
04 NO AIR CONDITIONER
97 DON'T KNOW
98 REFUSED

(ASK E9 IF E8=01, CENTRAL AIR CONDITIONER
E9. What temperature do you set your air conditioner on when you are doing things around the home in the summer?

01 TEMPERATURE _____
97 DON'T KNOW
98 REFUSED

E10. Does your air conditioner cool your home to a comfortable temperature?

01 YES
02 NO
97 DON'T KNOW
98 REFUSED

E11. Was there a time in the past year that your home was uncomfortably warm and you could not afford to cool it?

01 YES
02 NO
97 DON'T KNOW
98 REFUSED

E12. How do you rate the health of your household members overall?

01 VERY HEALTHY
02 SOMEWHAT HEALTHY
03 SOMEWHAT UNHEALTHY
04 VERY UNHEALTHY

That was my last question. Thank you very much for your time and cooperation. Have a pleasant day/evening.