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Identifying and Correcting Health Hazards in the Home: A Pilot Test Among Homes in Clark County, Nevada

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IDENTIFYING AND CORRECTING HEALTH HAZARDS IN THE HOME:

A PILOT TEST AMONG HOMES IN CLARK COUNTY, NEVADA

By

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ABSTRACT

IDENTIFYING AND CORRECTING HEALTH HAZARDS IN THE HOME: A PILOT TEST AMONG HOMES IN CLARK COUNTY, NEVADA

by

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The Nevada Healthy Homes Partnership (NVHHP) is collaboration between University of Nevada – Las Vegas (UNLV), the Southern Nevada Health District (SNHD), and other public and private housing authorities and health agencies throughout Clark County, Nevada. The primary mission of the NVHHP is to improve the health of Nevada residents, particularly those in disadvantaged communities, by identifying and addressing conditions in the home environment. For this study, a program created by the NVHHP, entitled "Nevada Healthy Homes" (hereafter, Healthy Homes) was piloted. Home health and risk assessments were conducted in 52 homes, with one or more interventions being provided to the primary resident of each home. These interventions included home-specific educational materials, home safety and cleaning devices, and home remediation. Data were analyzed and findings were summarized. Findings demonstrate an increase among participating households in self-reported ratings of home safety ($Z = -2.307$, $P=.021$) and in self-reported ratings of overall home satisfaction ($Z = -2.004$, $P= .045$). Data gathered provide insight on unhealthy conditions common in Clark County, Nevada. Suggestions for improvement and areas of future research are provided.

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PREFACE

The Department of Environmental and Occupational Health (DEOH) at the University of Nevada, Las Vegas (UNLV), School of Community Health Sciences, conducted an applied research project entitled, **"Identifying and Correcting Health Hazards in the Home: A Pilot Test Among Homes in Clark County, Nevada"**. This project was a pilot test for the recently developed program known as Healthy Homes, a program established and administered by a newly formed collaborative known as the Nevada Healthy Homes Partnership (NVHHP). The Healthy Homes program aims to improve the health and quality of life of Nevada residents living in Clark Country by first identifying health hazards and then empowering individuals through educational materials and resources to correct the problems identified. This program, once fully implemented, will be helpful in establishing baseline data regarding health hazards in Clark County and will be useful in securing future grants and funding to promote wellness and health in the home.

The development of the NVHHP, and ultimately the development the Healthy Homes program, was inspired in part by the Childhood Lead Poisoning Prevention Program (CLPPP), a program administered by the Southern Nevada Health District (SNHD) and funded by the Centers for Disease Control and Prevention (CDC). As health professionals entered pre-1978 homes to detect the presence of lead, other health problems related to housing and the home environment were evident. Funding at that time did not allow action outside of the scope of lead poisoning prevention to occur, however, a strong need for a more comprehensive approach to health and housing was apparent. Although progress was made in the surveillance and prevention of childhood

lead poisoning due to collaborative efforts of SNHD and UNLV, additional health concerns were raised and identified for residents of Southern Nevada.

The Healthy Homes program includes many of the objectives established by the CLPPP, but is a program that takes a more comprehensive approach to health and housing. Numerous health conditions are caused or exacerbated by exposures or conditions in the home environment. Allergies, asthma, unintentional injuries and poisoning, cancer, and heart disease are among health problems connected to the design and condition of housing as well as resident exposure to hazards such as cigarette smoke. By first assessing housing hazards and health conditions in the home, and then providing residents with educational resources and resources for remediation, the Healthy Homes program seeks to improve health outcomes by modifying the home environment.

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CHAPTER 1

INTRODUCTION

Numerous health conditions are caused or exacerbated by exposures or conditions in the home environment. Allergies, asthma, unintentional injuries and poisoning, cancer, and heart disease are among health problems connected to the design and condition of the home environment. Because individuals spend up to 90 percent of their time indoors, the home environment is a setting worthy of public health attention (Dales, Ling, Wheeler, & Gilbert, 2008). This study addresses the home environment as a primary contributing factor to health and quality of life.

The overarching purpose of this study was to pilot and evaluate an emerging program known as Healthy Homes. By first assessing housing hazards and health conditions in the home, and then providing residents with educational materials and resources for remediation through community partners, the Healthy Homes program seeks to improve health outcomes by modifying the home environment.

There were two primary goals of this research project. The first goal was to pilot test the Healthy Homes program with Rebuilding Together (RBT) and other community partners. The second goal of this study was to test four specific hypotheses related to home safety, overall home satisfaction, knowledge of factors related to creating and maintaining a healthy home environment, and changes in hazard density scores among participating homes. The research questions, objectives, and hypotheses encompassed by this study are described hereafter.

Research Questions

1. Will self-reported ratings of home safety increase among residents of Clark County after participating in the pilot test of the Healthy Homes program?
2. Will self-reported ratings of overall home satisfaction increase among residents of Clark County after participating in the pilot test of the Healthy Homes program?
3. Will knowledge of factors related to creating and maintaining a healthy home, improve among Clark County residents participating in the Healthy Homes program, after receiving program educational materials?
4. Will hazard-density scores obtained from each home assessment decrease among residents of Clark County participating in the pilot test of the Healthy Homes program?

Hypotheses

1. Self-reported ratings of home safety will increase among residents of Clark County after participating in the Healthy Homes pilot program.
2. Self-reported ratings of overall home satisfaction will increase among residents of Clark County after participating in the Healthy Homes pilot program.
3. Knowledge of factors related to creating and maintaining a healthy home, will improve among Clark County residents participating in the pilot test of the Healthy Homes program, after receiving program educational materials.
4. The hazard-density scores obtained from each home assessment will decrease among residents of Clark County participating in the pilot test of the Healthy Homes program.

To achieve the specific aims described above, researchers took a descriptive, quasi-experimental approach to measure outcomes produced by participation in the pilot test of the Healthy Homes program. Although researchers were able to test hypothesis one and hypothesis two, hypothesis three and hypothesis four were not tested due to limitations that arose during the duration of this project. These limitations are described in the 'Discussion of Results' section.

This project involved data collection through surveys and questionnaires regarding health behavior and the home environment. The pre- and post- test design of this study, accomplished through the utilization of the assessment tools and questionnaires created for this study, allowed progress and change to be measured and evaluated throughout the duration of the program. Results yielded from this study allowed researchers to evaluate the process and impact of the Healthy Homes program in its initial stages of delivery. The continuation of the Healthy Homes program has the potential to improve the health and quality of life for thousands of residents living in Clark County, Nevada.

Target Population

In 2008, the Department of Environmental and Occupational Health at UNLV conducted a sample of 88 housing inspections to determine the unhealthy home conditions in Clark County (Torres, 2009). Over 50 percent of housing that needed interior and/or exterior remediation was located in areas that were selected as target zip codes for the Healthy Homes program (Table 1).

Table 1. Target Areas for Healthy Homes

Zip Code	Clark County Community
89106	Las Vegas, NV
89030	North Las Vegas, NV
89110	Las Vegas, NV
89109	Las Vegas, NV
89121	Las Vegas, NV
89119	Las Vegas, NV
89101	Las Vegas, NV
89104	Las Vegas, NV
89107	Las Vegas, NV

These target zip codes are comprised primarily of low-income, older communities containing high-risk groups such as Hispanics and families with young children (Torres, 2009). The selection of these target zip codes was solidified after the utilization of the National School Lunch Program in Clark County was explored among middle schools in Clark County, to determine the location of a Healthy Homes poster contest that was directed at middle school students. All but two of the zip codes listed above were represented in a list of the top 15 middle schools in Clark County for utilization of the National School Lunch Program for March 2010 (CCSD, 2010). The specified target zip codes represent areas where educational activities and outreach efforts have taken place throughout the duration of the project, as well as areas where outreach events will be held in the near future.

Focal Areas

To better understand the scope of the Healthy Homes program, and its relevance to this project, it is important to note that the Healthy Homes program targets low-income

communities in Nevada by focusing on four focal areas. These focal areas are reducing asthma triggers, preventing unintentional injuries, eliminating poisoning hazards, and leveraging resources to fix structural problems in the home. The long-term goal of the Healthy Homes program is to improve the overall health and quality of life for the occupants of participating homes.

The Healthy Homes program is centered on the Seven Principles of Healthy Homes as established by the National Center for Healthy Housing. These Seven Principles of Healthy Homes are Keep it Dry, Keep it Clean, Keep it Pest-Free, Keep it Safe, Keep it Contaminant-Free, Keep it Ventilated, and Keep it Maintained (Table 2).

Table 2. The Seven Principles of Healthy Homes

Principle	Action
Keep it Dry	Prevent water from entering the home due to leaks in roofing systems or poor drainage. Check interior plumbing for leaks and water damage.
Keep it Clean	Control the source of dust and contaminants by creating smooth and cleanable surfaces, reducing clutter, and using effective wet cleaning methods. Remove shoes when entering the home and properly store food.
Keep it Pest-Free	Pests need food, water, and shelter to survive all of which can be found in the home. Seal cracks and openings, store all food in pest-resistant containers, and use sticky traps or baits if necessary to keep pests away.
Keep it Safe	Store poisons and medications out of the reach of children and with proper labels. Keep children's play areas free from hard or sharp surfaces and secure any lose rugs. Install smoke and carbon monoxide detectors. Keep fire extinguishers on hand and have a planned fire escape route.
Keep it Contaminant-Free	In homes built before 1978, fix deteriorated paint and clean all floors and window areas frequently. Test the home for radon and install a radon removal system if necessary.
Keep it Ventilated	To supply fresh air and to reduce the concentration of contaminants in the home, kept it ventilated. Effective ventilation is especially important in bathrooms and kitchens.

Keep it Maintained	Inspect, clean and repair the home regularly. Taking care of minor repairs right away often prevents them from becoming larger problems.

Source: (National Center for Health Housing, 2010)

These 7 principles make up the primary topics of the assessment tools developed for the Healthy Homes program and are the underlying basis of the educational materials that were used as a standard intervention in this project. For the purposes of this particular project, a Keep it Green section was also added and included in the educational and intervention materials. This project stands as an integral part of the program development process for Healthy Homes and promoted the creation and maintenance of a healthy home environment. Through this project, low-income, at-risk households and communities that suffer disproportionately from the burden of specific diseases related to housing received the empowerment and resources necessary to improve the home environment.

CHAPTER 2

REVIEW OF RELATED LITERATURE

Determinants of Healthy Homes

Structural Components and the Built Environment

According to the U.S. Department of Housing and Urban Development (2009), a healthy home is one that is marked by the absence of health and safety threats in the built environment, and is a home that nourishes physical, mental, social and environmental well-being. The majority of individuals spend approximately 90 percent of their time indoors, making the built environment, specifically the home environment, critical to one's health and wellbeing (Dales, Ling, Wheeler, & Gilbert, 2008). The home is made up of a dynamic network of interacting factors that influence each member of the home (Bradley, 2004). A number of structural components in the home are connected to health and need to be properly maintained to enhance conduciveness to positive health outcomes. Asbestos in drywall or ceiling materials, damaged window sills and doors, broken stairs and uneven floor panels are all structural components frequently found in the home that can lead to injury or illness in the home. Carpet containing contaminants, substrates with lead-based paint, slippery walkways, and insufficient barriers to dangerous areas such as pools or playground equipment are also structural components of the home that can negatively influence one's health and wellbeing.

A study comprised of similar methods and objectives as the Healthy Homes pilot project being proposed was conducted by Dixon, Fowler, Harris, Moffat, Martinez, Walton, Ruiz, and Jacobs in 2009. Researchers examined the effects of combining

asthma trigger reduction with housing structural repairs, device disbursement and education in low-income households with children on self-reported respiratory health and reduce housing-related respiratory health and injury hazards. A home-specific intervention was designed to provide parents or caretakers with the knowledge, skills, motivation, supplies, equipment, and minimum housing conditions necessary for a healthy and safe home. Of those who participated in this study, 97% of parents reported that their homes were safer following the interventions. Furthermore, four months after the intervention was given, 96% of participants reported that the respiratory health and asthmatic symptoms of them or their child improved. Dixon, Fowler, Harris, Moffat, Martinez, Walton, Ruiz, and Jacobs (2009) found that a tailored healthy homes improvement package significantly improves self-reported respiratory health and safety, and reduces respiratory health and injury hazards. The *Identifying and Correcting Health Hazards in the Home: A Pilot Test Among Homes in Clark County, Nevada* project produced similar results and health outcomes.

A study conducted by Matthews and Tse-Chuan (2010) found that the built environment can also influence health by impacting one's level of stress. Matthews and Tse-Chuan (2010) found that the association between stress and health varies by residential neighborhood and is influenced highly by residential stability and social characteristics. Researchers found that those who felt safe in their home and trusted their neighbors experienced lower levels of stress. The Matthews and Tse-Chuan (2010) study is effective in demonstrating the impact that the environment has on one's overall level of stress, and illustrates the relationship between stress and health.

Much research has been published about the relationship between the built environment and specific health behaviors such as the physical activity and the purchase and consumption of healthy food items (Krieger, Rabkin, Sharify, & Song 2009; Troped, Wilson, Matthews, Cromley, & Melly, 2009; Maley, Warren, & Devine, 2010) however, research focusing specifically on the built environment and health outcomes is somewhat limited. The *Identifying and Correcting Health Hazards in the Home: A Pilot Test Among Homes in Clark County, Nevada* study sheds light on the relationship between the structural components of the built environment in the home, and the health outcomes of the home residents.

Environmental Factors

Lead

Lead is a metal that is widely used in society for a variety of purposes. The properties and characteristics of lead make it a suitable medium for many functions. Lead has a high density and a strong resistance against corrosion making it an optimal component in the design of items such as fishing equipment, sound insulation mechanisms, storage compartments, and batteries (Sharma et al., 2009). Because lead has a low melting point, lead is often used for firearms (Demmeler, Nowak, & Schierl, 2009) and as a covering for electrical cords (Virji, Woski, Pepper, 2009). Lead sheets are frequently used in the construction industry to cover structures and to prevent water penetration (Virji, Woski, Pepper, 2009). In addition, lead is also found in pipes and can be found in certain types of tile and ceramics (Rabin, 2008; Gorospe & Gerstenberger, 2008). In pre-1978 housing, lead-based paint is frequently found in the home environment.

Although lead is a functional element that serves a variety of purposes, lead is a toxic metal with the ability to cause detrimental health effects. Children, ages 6 and under, are especially at risk for lead poisoning because of their rapid growth rate and their tendency to engage in hand-to-mouth activity (CDC, 2009). Lead can cause health problems including severe abdominal pain, irritability, decreased consciousness, and motor and sensory deficits (Needleman, 2004; Gorospe & Gerstenberger, 2008). Lead exposure can also lead to kidney damage, sterility, miscarriage and birth defects (Nadakavukarn, 2006). Furthermore, if left untreated, elevated blood lead levels (EBLLs) can cause learning disabilities including difficulties with reading, intellectual delays, school failure, attention deficiency hyperactivity disorder and antisocial behavior (Lanphear, 2007). A study by Quillen (2009) investigated the relationship between learning and lead exposure in a sample of students from Detroit public schools. This study found that students identified with special needs had significantly higher blood lead levels than other students.

Over the past few decades, as the harmful effects of lead have become more evident, policy developments and changes of legislature have provided a dramatic decrease in the incidence of lead exposure. The removal of lead from gasoline, a policy in the United States initiated in 1976 and completed in 1995, resulted in a fourfold reduction of median blood lead levels in U.S. children from 1976-1991 (Silbergeld, 1997). Additional progress has been seen in the reduction of childhood lead poisoning risks through the cessation of lead-based paint as a standard feature in the construction of buildings and homes.

Despite the progress that has been achieved, preventable cases of childhood lead poisoning still occur making childhood lead poisoning an ongoing public health concern (Khan, Qayyum, Saleem, Ansari, & Khan, 2010). Sources of lead exposure can be present in the built environment making the environment a primary focus in decreasing risks associated with lead poisoning. Traditional sources of lead include items such as household paint, gasoline, and pesticides, however due to public health policy and legislation these sources are no longer areas of great concern (SNHD, 2006). Many cases of childhood lead poisoning occur as a result of exposure to non-traditional sources including imported candy, ceramic tile, imported jewelry and toys, and risk factors associated with parental occupation (Gorospe & Gerstenberger, 2008). Lead exposure can occur through inhalation, ingestion, and through dermal exposure (Dixon et al., 2009). An individual can experience lead poisoning due to contaminated air, contaminated dust and soil, polluted water, lead adulterated food, and lead supplemented medicine (Herman, Geraldine, Scott, & Venkatesh, 2006). Lead exposure in any amount is dangerous and should be avoided through effective preventative action.

The DEOH at UNLV and the Southern Nevada Health District (SNHD) conducted a study in which 55 homes in Clark County, all located in the target zip codes, were assessed for lead-based paint hazards. Forty of these homes (73%) contained lead-based paint. The Healthy Homes program addresses lead poisoning prevention through the Abbreviated Lead Risk Assessment, offered as a standard procedure to all households participating in the Healthy Homes program. The *Identifying and Correcting Health Hazards in the Home: A Pilot Test Among Homes in Clark County, Nevada* study

confirms the harmful effects of lead poisoning described in already existing literature and demonstrates that lead is still a problem in some housing units in Clark County, Nevada.

Asthma Triggers

Another hazard that is addressed through the Healthy Homes program is asthma. Asthma is an inflammatory disorder of the airways in which the airways expand and contract creating symptoms such as coughing, wheezing, and shortness of breath (Mayo Clinic, 2010). Over 16.4 million adults in the United States currently suffer from asthma (CDC, 2010). The prevalence of asthma in the target zip codes is displayed in Table 3. These figures represent data from children in grades K-12.

Table 3. Asthma Rates in Target Zip Codes in Clark County

Average Asthma Prevalence by Target Zip Code and School Year						
	2006-2007			2007-2008		
Zip Code	**# of Schools**	**Average Prevalence**	**Range**	**# of Schools**	**Average Prevalence**	**Range**
89106	9	10.29%	5.0 - 13.6%	11	11.21%	6.5 - 16.0%
89030	15	8.00%	5.5 - 16.0%	14	8.66%	5.2 - 14.9%
89110	16	7.30%	3.4 - 9.7%	16	7.16%	1.1 - 10.1%
89121	8	8.70%	6.4- 10.7%	8	9.29%	7.2 - 12.3%
89119	5	8.58%	6.4 - 10.5%	5	8.90%	5.7 - 11.1%
89101	20	8.10%	1.2 - 21.1%	13	8.73%	5.6 - 14.5%
89104	10	6.73%	3.8 - 11.9%	9	7.89%	1.7 - 13.6%
89107	11	8.85%	6.2 - 11.5%	11	9.34%	5.9 - 13.6%
89109	5	7.40%	6.6 - 7.8%	4	7.55%	5.7 - 9.4%

Source: (Moonie, 2009; Clark County School District, 2006-2008)

Asthma attacks can interfere with daily activities and can be life-threatening. Asthma cannot be cured but measures can be taken to reduce and avoid particular asthma triggers. Walker and Chen (2010) measured lung function, eosinophil counts, and daily cortisol, on two occasions, 18 months apart, and found that poorer family asthma

management was associated with increasing counts of eosinophil and decreased rates of cortisol over time. Furthermore, families that reported poorer collaboration with their physician also had lower levels of lung function over time. The Walker and Chen (2010) study suggests that education in the area of asthma management has the potential to actually alter biological profiles among children, and can lead to a lifetime of better control for asthmatics. The Healthy Homes program provides educational materials on asthma to empower individuals with the information needed to gain and maintain control of asthma. Asthma may be triggered by many environmental factors in the home such as mold, dust mites, cockroaches, and secondhand smoke. These asthma triggers are discussed below.

Mold. Molds are a naturally occurring part of the environment that help to break down dead organic matter, however, when mold is found indoors, it can harmful to one's health (EPA, 2010). Thousands of species of molds exist but all produce tiny, microscopic spores that float through indoor and outdoor air (HUD, 2010). These spores cling to substrates with high moisture content and then reproduce. If inhaled or touched, mold spores can cause allergic reactions and can therefore be triggers for asthma attacks.

A variety of health problems develop as a result of high exposures to mold, most being related to the respiratory system. Mold exposure can also lead to headaches, fevers, skin rash, nausea, and sinus infections (Hardin, Kelman, & Saxon, 2003; Dales, Zwanenbury, Burnett, & Franklin, 1991). A study by Straus (2009) found that sick building syndrome (SBS) is often associated with an unseen infestation of mold present in the buildings. Curtis, Lieberman, Stark, Rea, and Vetter (2004) found that indoor mold exposure can alter immunological factors and produce allergic reactions. Furthermore,

molds can alter brain blood flow, autonomic nerve function and brain waves, and can worsen concentration, attention, balance and memory (Curtis, Lieberman, Stark, Rea, & Vetter 2004). One study investigated the effects of mold on physical illness and found that mold in the home was associated with depression, independent of one's individual and housing characteristics (Shenassa, Daskalakis, Leibhaber, Braubach, & Brown, 2007).

To prevent mold from growing indoors, moisture levels must be controlled. Among 88 homes evaluated to determine the remediation needs present in Clark County, 24% had moisture intrusion and mold contamination. Furthermore, of these homes 50% had water stains or obvious water leaks (Torres, 2009). Addressing mold problems was an important part of the home assessments included in this project and is critical to reducing asthma attacks and improving overall health outcomes. The majority of research studies investigating the affects of mold have been conducted in a large building setting rather than in the home environment. Additional research about home health and mold is needed.

Dust Mites. Dust mites are present in every home and are primarily found in carpet, furniture, and mattresses. Professionals estimate that more than 100,000 live dust mites reside in the average pillow and over 1 million dead dust mites are in the average bed mattress (Fleming, 2010). Dust mites live for about six weeks and are another trigger for asthma and respiratory illness (Leaderer et al., 2002). Jedrychowski and colleagues (2009) collected dust samples from mattresses, children's bedrooms and kitchen floors in 279 dwellings. Respiratory outcomes tracked for the purposes of the Jedrychowski et al. (2009) study included a runny or stuffy nose, barking cough, puffed breathing, and

wheezing and whistling in the chest. For each of the homes, the number of symptoms listed above was recorded. Results demonstrated a direct relationship with the amount and severity of respiratory symptoms and the amount of dust mites found in the dust samples (Jedrychowski et al., 2009).

A similar study conducted by Gotzsche and Johansen (2008) investigated the specific impact that dust mites can have on asthma and explored the results of several interventions implemented to reduce dust mites in the home. This study demonstrated no statistical significance in the number of dust mites present in homes after using mattress covers and chemical products. According to this study, chemical and physical methods aimed at reducing exposure to house dust mite allergens cannot be recommended as a method to reduce asthma (Gotzsche & Johansen, 2008), however additional studies contradict these findings and support such interventions. Schei, Hessen, and Lund (2002) found that dust mite feces were eight times more prevalent in mattresses without a cover as compared to mattresses without a cover, and found that spring mattresses had fewer dust mites than foam mattresses.

Additional research is needed in this area to determine if mattress covers really do help lower the overall amount of dust mites in the home. Although data is lacking in this area, it is a well-established fact that dust mites trigger asthma attacks and need to be controlled. Education in this area, including recommendations to wash bedding every week and use wet cleaning methods such as mopping, are needed in the Clark County community and would be provided through this project. The *Identifying and Correcting Health Hazards in the Home: A Pilot Test Among Homes in Clark County, Nevada* study

contributes to the existing knowledge and literature currently available regarding dust mites and their effect on asthma and health.

Cockroaches. Cockroaches are among the most serious of pests because they are able to transport microbes on the surface of their bodies and carry proteins that trigger allergic reactions and asthma attacks (UC IPM Online, 2008). Cockroaches are highly attracted to food and water sources and leave chemical trails in their feces to attract other cockroaches (Leaderer et al., 2002). Several studies support the effectiveness of integrated pest management (IPM) for controlling the presence of pests in or around the home. Traditional pest control involves the use of scheduled applications of pesticides by professionals as well as pesticide use by residents, whereas, IPM involves sanitation, building maintenance, and limited use of least toxic pesticides (Kass et al., 2009). Integrated pest management was the approach taken by the Healthy Homes program as a method to pest control (Kass et al., 2009). Kass et al. (2009) made a control group of homes receiving traditional pest control and compared it to homes receiving IPM and found that those households receiving IPM had significantly lower counts of cockroaches after both 3 months and 6 months. Furthermore, residents of IPM apartments were also more satisfied with building services and living conditions (Kass et al., 2009).

Perzanowski and Platts-Mills (2009) further demonstrate the importance of IPM and the harmful effects caused by cockroaches in relation to asthma symptoms. Researchers of this study found that hospitalizations for asthma in inner-city communities were associated with a specific immunoglobulin antibody and allergen found in cockroaches. Cohn, Arbes, Jaramillo, Reid, and Zeldin (2006) report that after assessing 831 U.S. homes, 13% had cockroach allergens that exceed the limit for allergic sensation.

In 10% of these homes, the cockroach allergens exceeded the concentration limit for asthma morbidity as well. Cockroaches are most frequently found in high-rise apartments, urban settings, pre-1940 constructions, and households with incomes lower than $20,000 (Perzanowski & Platts-Mills, 2009; Cohn, Arbes, Jaramillo, Reid, & Zeldin, 2006). These conditions are common in many Clark County communities, making Clark County an optimal location for cockroaches and other pests to reside. Because the winter season in Clark County from 2009-2010 was very wet, temperatures were never low enough to kill existing cockroaches and their eggs. The unusually moist winter, followed by a long series of record high temperatures in Summer 2010, caused a rapid increase in the cockroach population in Clark County, making cockroaches more prevalent now than in previous years and increasing the need to utilize IPM techniques in Clark County communities (Channel 8 News Now, 2010).

Integrated pest management is an important educational element of the Healthy Homes program and was used to reduce the amount of cockroaches in the homes of participants, ultimately reducing triggers for asthma among program participants. The *Identifying and Correcting Health Hazards in the Home: A Pilot Test Among Homes in Clark County, Nevada* project provides further evidence of the strong association between cockroaches asthma development.

Secondhand Smoke. Exposure to secondhand smoke is associated with morbidity from coronary heart disease, lung cancer, respiratory infections, exacerbated asthma, and sudden infant death syndrome (SIDS) (Wolfson, McCoy, & Sutfin, 2009). Secondhand smoke exposure has also been linked middle ear disease and decreased lung function (Kaufmann et al, 2010). A meta-analysis conducted by Vork, Broadwin and Blaisdell

(2007) found that exposure duration to secondhand smoke was directly related to the development of childhood asthma. Nearly all nonsmokers who live with someone who smokes inside their home are exposed to SHS on a regular bases, children among those being most exposed (Kaufmann et al., 2010).

The current smoking prevalence rate in Nevada is 21.5% or 584,442 smokers (NSHD, 2010). Trends demonstrate that smoking rates increase as income and education levels decrease, further supporting the need for interventions in target zip codes (NSHD, 2010). According to the National Survey of Children's Health, 25.4% of children in Nevada live in households where someone smokes (NSCH, 2010). Reducing secondhand smoke in the home environment decreases health problems related to asthma and helps prevent advanced respiratory illness among children and other residents in the home. Literature regarding the harmful effects of secondhand smoke is already well-established and readily available, however the pilot test that was conducted provides additional data about secondhand smoke, specifically in homes located in Clark County, Nevada. Such data, at this time, is otherwise not readily available.

Injury Prevention

Unintentional injury most often occurs in the home and is frequently preventable. Injuries are the leading cause of death among Nevadans aged 1 to 44 years (Chino, LaValley, Haff, Harris, & Rivers, 2010). Nevada's injury mortality exceeds the national rates in several types of injury including unintentional poisoning and unintentional drowning (Chino, LaValley, Haff, Harris, & Rivers, 2010). According to data provided by the Clark County Traumatic Injury Report in September of 2008, falls, firearms, and

cuts were among the most common mechanisms for injury among adults in Clark County (UMC, 2008).

According to Simpson, Turnbull, Ardagh, and Richardson (2009), more than half of injury deaths and hospitalizations among 0-4 year olds occur at home. In addition, Tsoumakas, Dousis, Mavridi, Gremou, and Matziou (2009) found that the same is true among children 6 years and under. Additional injury data for children in Clark County is somewhat limited, but data does exist and support the problem of drowning in Las Vegas (Table 4).

Table 4. Clark County Child Drowning Statistics (14 and <) – 1998-2008

Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Submersion Incidents	53	62	50	67	56	42	39	50	40	55	54
Submersion Rate*	19.35	21.52	16.56	20.89	16.76	12.03	10.59	13.01	9.91	13.20	12.56
Four Years Old & <	79%	86%	81%	77%	88%	81%	79%	82%	80%	80%	81%
Public Pools	37%	46%	76%	47%	42%	33%	43%	29%	40%	26%	34%
Home Pools	63%	54%	24%	53%	58%	67%	57%	71%	60%	61%	66%
Non-Fatal Drowning	39	52	44	57	49	32	35	44	33	46	45
Fatal Drowning	14	10	6	8	6	10	4	6	7	9	10
Children 0-4 drowned	11	9	5	3	6	8	3	6	5	9	10
Death Rate 0-4 *	11.49	8.97	4.77	2.7	5.18	6.65	2.4	4.6	3.6	6.4	5.96
Death Rate 0-4, US	3.14	3.12	2.99	2.72	2.64	2.6	2.63	2.74	-	-	-

Source: (University Medical Center, 2008) *Per 100,000 Clark County Residents

Because Clark County experiences six to eight months of warm weather each year, drowning is a serious health risk for children 1-4 years of age. Strategies to prevent drowning are encompassed in the Healthy Homes program material.

A study was conducted to investigate parents' knowledge and practice of preventive measures concerning children's home accidents. Through the administration of an anonymous questionnaire, researchers found that more than half of parents did not adhere to preventive measure for children's accidents at home, and nearly half claimed an information deficit. This study demonstrates the immense need that is present to educate parents about home safety and injury prevention measures (Tsoumakas, Dousis, Mavridi, Gremou, & Matziou, 2009).

Mayhorn, Nichols, Rogers, and Fisk (2004) examined older adults' perceptions of hazards associated with home product usage and beliefs about product warnings. Surprisingly, older adults reported routine use of products that they considered to be hazardous. Although some people may believe or know something is hazardous, they may continue to use that product due to an absence of alternative products. By providing residents with safe and healthy products and alternatives to use in the home, the Healthy Homes program avoids this disconnect between home hazard perceptions and home hazard use and exposure. Personal experience plays a vital role in the formation of one's perception of safety (Mayhorn, Nicholes, Rogers, & Fisk, 2004). By working one-on-one with residents, and making home visits personal, project teams members involved in the *Identifying and Correcting Health Hazards in the Home: A Pilot Test Among Homes in Clark County, Nevada* project were able to create a personal experience with injury prevention, those residents that participated in the Healthy Homes pilot project.

According to a meta-analysis conducted by Kendrick, Barlow, Hampshire, Stewart-Brown, and Polnay (2008), parenting interventions provided within the home, using multi-faceted interventions, appear to be effective in reducing unintentional child

injury. The conclusions drawn from this meta-analysis support the approach to education that was used in this Healthy Homes pilot project.

Poisonous Hazards

The Centers for Disease Control and Prevention (CDC) defines a poison as any substance that is harmful to the body when ingested, inhaled, injected, or absorbed through the skin (Chino, LaValley, Haff, Harris, & Rivers, 2010). According to the American Association of Poison Control Centers, 90.5% of all potential poison exposures happen in the home, and everyday there are 2,491,049 human exposure cases (AAPCC, 2010). In 2006, 75 people died every day from unintentional poisoning, and the number is increasing (CDC, 2010). Poisoning mortality rates in the U.S. increased by 63% from 1999 to 2004 (CDC, 2010). Furthermore, Bohnert, Fudalai and Ilgen (2010) found that poisoning morality rates increased 108.5% between 1999 and 2006. It is clear that strategic prevention methods are needed to combat rising rates of unintentional injury.

In Nevada, poisoning rates are also increasing. Poisoning trends in Nevada are illustrated in Figure 1.

Source: Injury in Nevada. (Chino, 2010)

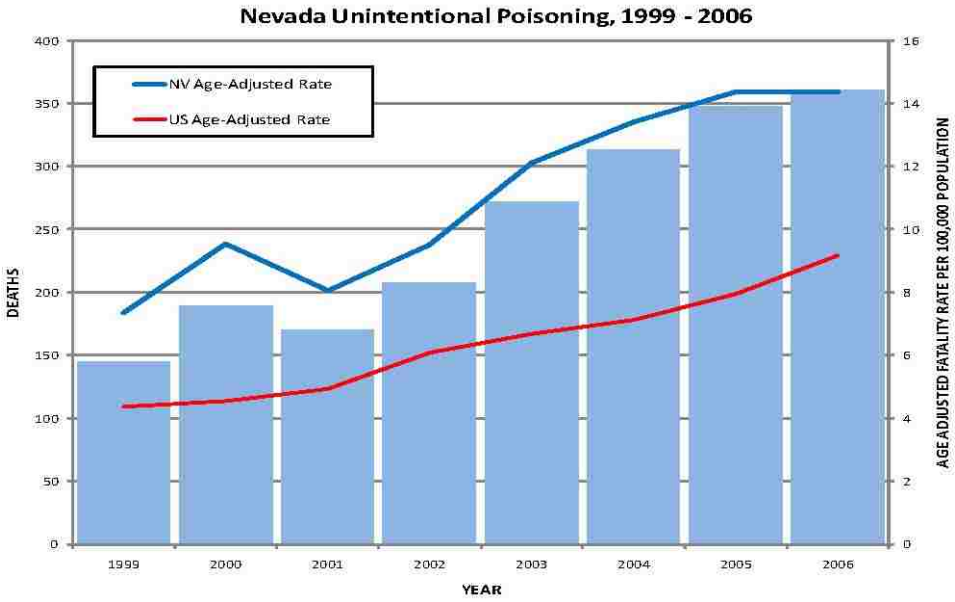

Figure 1. Nevada Unintentional Poisoning, 1999-2006

After examining mortality rates by age group, gender, and intent, Bohnert, Fudalai, and Ilgen (2010) found that poisoning rates in the U.S. were highest among individuals 40-49 years of age, a trend that is also true for Nevada (Chino, LaValley, Haff, Harris, & Rivers, 2010). Nevada poisoning mortality rates by age are illustrated in Figure 2. Source: Injury in Nevada. (Chino, 2010)

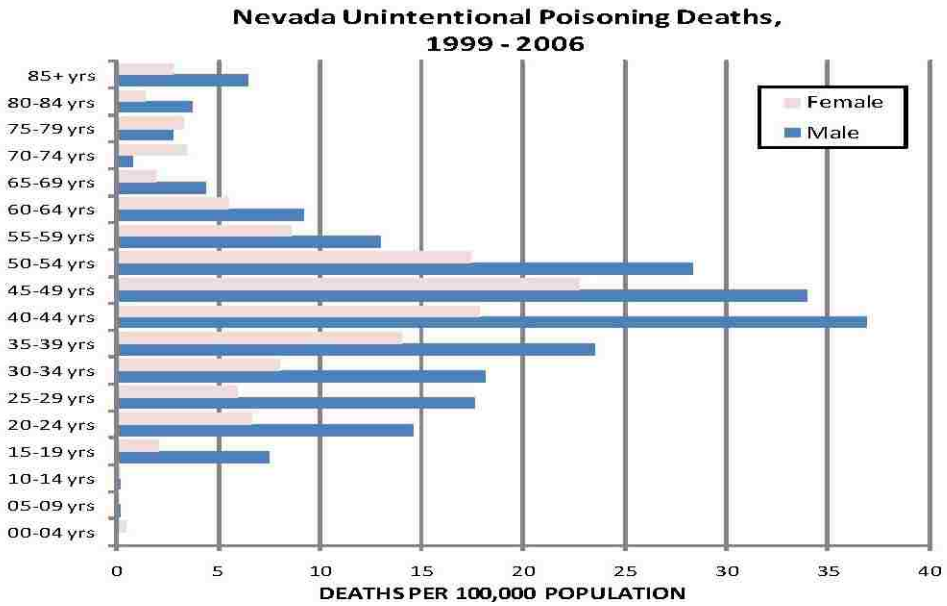

Figure 2. Nevada Unintentional Poisoning Deaths, 1999-2006

The Healthy Homes program advises residents on how to properly store unsafe chemicals and prescription drugs to prevent unintentional poisoning. Resnik and Zelden (2008) discuss the ethical and legal duty that public health professionals have to warn people about home hazards and accompanying health conditions. A statement included in the Resnik and Zelden (2008) report is in harmony with the intent of Health Homes and the proposed pilot project. This statement is especially applicable when discussing poisoning prevention strategies:

> "Investigators should warn subjects and occupants about hazards they happen to discover while they are in the home. Should not report illegal hazards unless they involved the neglect or abuse of children. Researchers should take steps to help them make effective use of the information, such as providing additional counseling or making a referral for remediation or medical treatment."

Although data is available regarding childhood lead poisoning in Nevada, other cases of poisoning are not well documented. Data for Nevada regarding childhood poisoning is lacking and will be enhanced by information provided by this study, as well as the data provided by the Healthy Homes program in the future.

Leveraging Resources

As one of the four focal areas of Healthy Homes, leveraging resources is an important facet of the development and administration of this pilot test. Literature discussing strategies for leveraging community resources emphasizes the importance of allowing community partners to be active participants in the planning and implementation process of a program (Franco, Mckay, Miranda, Chambers, Paulino, & Lawrence, 2007). Contributions from community partners will enhance the sustainability of this project, and will allow team members to evaluate, expand, and continue the administration and scope of Healthy Homes.

Social Considerations

Demographics

Clark County is a place of cultural diversity with residents originating from a variety of backgrounds. Each month more than 4,000 people make Clark County their home (Clark County Office of Diversity, 2010). Growth has slowed somewhat due to the national recession, but is expected to resume as the recession subsides. Table 5 illustrates the demographic data of residents of the target zip codes selected for this project.

Table 5. Demographic Data in Target Zip Codes

Demographic Data	89106	89030	89110	89109	89121	89119	89101	89104	89107
Total Population	25,563	53,794	61,898	40,855	61,669	48,693	52,617	39,779	36,180
• % Male	51.5%	52.5%	49.8%	55.9%	49.7%	53.2%	58.7%	51.8%	50.1%
• % Female	48.5%	47.5%	50.2%	41.1%	50.3%	46.8%	41.3%	48.2%	49.9%
• % White	34.8%	46.9%	61.7%	66.1%	78.3%	65.9%	53.5%	66.9%	73.6%
• % Black	45%	18.9%	11.7%	9.3%	6.4%	8.3%	12.1%	6.9%	6.7%
• % Hispanic	28.9%	63%	35%	34.4%	18.9%	31.7%	52.9%	34.8%	24.5%
Total Family Households	5,449	11,028	15,065	8,193	15,353	10,054	8,998	8,834	8,520

Source: (U.S. Census Bureau, 2000)

Nevada is a State that is highly affected by a number of health disparities. Many of these health disparities are attributed partly to race or ethnicity. Racial and ethnic minority populations are defined as American Indians and Alaska Native, Asia, Black or African America, Hispanic or Latino, and Native Hawaiian and Other Pacific Islander (Nevada Office of Minority Health, 2010). Nevada is home to a large number of ethnic minorities groups, making approaches to health somewhat complex in nature. As demonstrated in Table 5 above, a large number of Hispanic individuals and families reside in the target areas selected for this project. Health disparities are well cited in literature but a number of unresolved issues still remain.

Age is another demographic variable that may contribute to health disparities. Children and elderly individuals are often at highest risk for health issues and injury related to the home environment (WHO, 2010). The age distribution among target zip codes is illustrated in Table 6.

Table 6. Age Distribution of Target Zip Codes in Clark County

Age	89106	89030	89110	89109	89121	89119	89101	89104	89107
Under 5 years	2,362	6,034	5,647	2,714	3,587	3,361	4,737	2.866	2,612
18 Years & over	18,016	34,325	42,172	33,225	48,899	38,545	38,356	29,992	26,524
65 years & over	2,419	3,286	4,641	5,312	9,909	4,776	3,969	5,883	4,597
Median age	30.6	26.0	30.1	36.1	39.8	32.3	30.3	36.7	34.8
Total Population	25,563	53,794	61,898	40,855	61,669	48,693	52,617	39,779	36,180

Source: (U.S. Census Bureau, 2000)

The age distribution seems to be somewhat uniform across all target zip codes selected for this study, with 89030 comprised of the highest number of younger individuals and 89121 containing the greatest number of elderly individuals. Because age has such a direct influence on health, this information is vital to the design of programs related to health. This project adds insight to the effect of race/ethnicity and age on health disparities in Clark County.

Socioeconomic Status

The target zip codes selected for this project are located in areas of lower socioeconomic status (SES). Socioeconomic status is often a predictor and influencing factor in health outcomes. Quinn, Kaufman, Siddiqi, and Yeatts (2010) examined data provided by 682 parents in Chicago and found that higher risks for respiratory illness and rates of poor health were associated with higher rates of housing stressors. Housing stressors are components of the home environment that cause negative feelings, and are most frequently found in homes of lower SES. Researchers found that housing stressors produce psychological stress and impact health through biological and behavioral pathways (Quinn, Kaufman, Siddiqi, & Yeatts, 2010). Table 7 displays income and poverty levels of the selected target zip codes in Clark County.

Table 7. Income and Poverty Levels by Zip Code in Clark County, NV

	89106	89030	89110	89121	89119	89101	89104	89107	89109
Med. Family Income	32,894	31,632	45,456	33,860	45,827	36,193	28,106	45,536	45,801
Families < Poverty	1,187	2,424	1,715	1,216	989	1,365	2,245	895	601
Individuals < Poverty	6,748	13,011	8,389	5,885	8,338	13,448	5,581	3,810	7,386
Total Population	25,563	53,794	61,898	40,855	61,669	48,693	52,617	39,779	36,180

Source: (U.S. Census Bureau, 2000)

Among children in Nevada ages 0-5, 14% currently do not have health insurance, as compared the national average of 9%. Furthermore, among children in Nevada aged 6-17, 17% do not have health insurance, which is also much greater than the national average of 11% for the same age group (Annie E. Casey Foundation, 2010). These low rates of health insurance coverage among children in Nevada are largely attributable to the rate of unemployment in Nevada, which remains the highest unemployment rate in the nation. According to data provided by Kids Count, 14.9% of children in Nevada are living in poverty (Annie E. Casey Foundation, 2010).

Current data suggest that 41,900 children in Nevada are currently enrolled in CHIP and 143,700 are enrolled in Medicaid (Family USA, 2010). In July of 2009, approximately 68,969 people received assistance through the Women, Infants, and Children (WIC) program in Nevada (United States Department of Agriculture, 2010). Furthermore, in 2008, approximately 3,446 children received services through Head Start Programs, with 13% of those children being those with special needs. Unfortunately, only 13% of Nevada's eligible children are currently being served by the Head Start Program, leaving 87% in need of such services (Nevada Head Start Association, 2010). The

provision of services included in this pilot project, and the Healthy Homes program as a whole, is vital to the sustainability and health of communities in Clark County, Nevada. Literature strongly justifies the need of the Healthy Homes program in Clark County, and supports the impact of SES on health outcomes.

Educational attainment is a contributing factor to SES and also impacts health. In a study of 60 families with at least one child between the ages of 8 and 12, Nuru-Jeter, Sarsour, Jutte, and Thomas (2010) found that wealth and highest degree earned by parents were strongly associated with the physical and mental health of the children. Wealth and educational attainment of the parents were directly related to the child's social and academic functioning as well. Educational attainment in target areas is described in Table 8.

Table 8. Educational Attainment by Zip Code in Clark County, NV

Educational Attainment	89106	89030	89110	89121	89119	89101	89104	89107	89109	US Av
% H. S. graduate or higher	61.8	41.8	69.8	80.9	74.4	52.1	68.0	76.6	70.9	80
% Bachelor's degree or higher	7.5	2.9	10.0	15.7	14.7	5.6	9.5	11.9	15.1	24
Total Population	25,563	53,794	61,898	40,855	61,669	48,693	52,617	39,779	36,180	

Source: (U.S. Census Bureau, 2000)

By focusing on communities of lower SES, Healthy Homes empowers individuals that otherwise have limited opportunity to overcome their living circumstances. Although this pilot test was not designed to solve every problem of every home enrolled in the study, the *Identifying and Correcting Health Hazards in the Home: A Pilot Test Among*

Homes in Clark County, Nevada project made a difference in the lives of program participants with lower levels of SES. The continuation of the Healthy Homes program has the potential to change the current living conditions of residents presently living in SES communities and can impact future health behaviors and attitudes of program participants.

Disability

One's ability to comply with the 7 Principles of Healthy Homes may be somewhat hindered due to disability. Research discussing the impact of the home environment on the outcome or enhancement of disability is lacking, but it is evident that disability must be considered when educating individuals on creating and maintaining a healthy home. Disability prevalence in the target zip codes is described in Table 9 below.

Table 9. Individuals in Selected Zip Codes Over Age 5 With Disability

Zip Code	**89106**	**89030**	**89110**	**89121**	**89119**	**89101**	**89104**	**89107**	**89109**
Individuals > 5 with Disability	6,249 24.4%	12,330 23.0%	13,426 21.7%	13,716 33.6%	10,880 17.6%	14,278 29.3%	10,137 19.3%	8,284 20.8%	10,521 29.1%
Total Population	25,563	53,794	61,898	40,855	61,669	48,693	52,617	39,779	36,180

Source: (U.S. Census Bureau, 2000)

Although disability is not a main focal area of this particular project, disability prevalence is an important factor to consider when striving to understand the context and characteristics of the target population.

Perception and Knowledge

Perception and knowledge are constructs that are somewhat abstract in nature, however literature documents a variety of methods employed to measure these constructs. In a study examining safety perception in the industrial work place, Gil and Yagil (2010) used interviewing as the primary method of gaining insight on determinants of safety perception. In exploring perceptions of school safety, Hernandez, Floden, and Bosworth (2010) compared quantitative data from law enforcement and qualitative data from focus groups comprised of parents and students. Dennis (2009) expresses the importance of survey utilization in collecting information related to safety perception in the home and work environment. A pre- and post- test design is a common method of measuring perceptions knowledge and is also strongly supported in literature. Moore and Tananis (2009) successfully used a pre/post test design to measure high school students' knowledge regarding core issues of International Studies. Watering, Gijbels, Dochy, and Rijt (2008) used a pre- and post- test design to gain more insight about the relationship between students' perceptions of test format and difficulty and actual test performance. The background information and context presented in these studies provide justification, insight, and reason for the methodology chosen for this study.

CHAPTER 3

METHODOLOGY

The pilot test of the Healthy Homes program conducted for this study involved a series of home visits in which structural hazards and health conditions were identified and then corrected through educational, device, or remediation interventions. This section provides a detailed description of program activities and the sequence of events that occurred as part of this Healthy Homes pilot test.

Study Design

The *Identifying and Correcting Health Hazards in the Home: A Pilot Test Among Homes in Clark County, Nevada* project is a descriptive, quasi-experimental design in which data were collected before and after the delivery of program interventions. There was no control group utilized for this study. Data were collected through the administration and utilization of assessment tools and questionnaires regarding health behavior and the home environment. The pre- and post- test design of this study, accomplished through the utilization of the assessment tools and questionnaires, allowed progress and change that occurred over the duration of the study to be measured. In order to perform relevant statistical analyses, the sample size selected for this study was a minimum of 20 homes (n=20). Institutional Review Board (IRB) approval for the conduction of this research project was obtained in January 2011 and is documented under "The Healthy Homes Building Strategic Alliance, Protocol #1008-3565" (Appendix 5).

Recruitment of Participants

To accomplish project goals and address the hypotheses presented in previous sections, it was necessary first to recruit participants for this study. One of our community partners Rebuilding Together (RBT) is a non-profit organization working to improve the living conditions of individuals living in low-income housing in Southern Nevada. Rebuilding Together, which currently has a large and growing cliental, provided many of the participants for this project. To be eligible for RBT services clients must meet the following guidelines: be low-income based on HUD guidelines (i.e. earn 80% or less of the area median income); own their own property for at least one year; and be a senior over the age of 60, disabled at any age, or have small children under the age of 10 living in the home. HELP of Southern Nevada was also a vital source of referrals for this project. To be eligible for services from HELP of Southern Nevada clients must be low-income based on HUD guidelines (i.e. earn 80% or less of the area median income) and provide documentation of current income. Additional participants were also provided through referrals from other community partners to help researchers obtain a convenience sample of 52 homes for this pilot project. Table 10 below lists the community partners most closely affiliated with the Healthy Homes program as well as the number of referrals that each entity provided for this project.

Table 10. Community Partners and Origin of Referrals

Community Partner	Referrals to Healthy Homes	
Rebuilding Together	13	25%
HELP of Southern Nevada	13	25%
Child Protection Services (CPS)	6	11.5%
Las Vegas Seven Magazine	6	11.5%
News Channel 3	4	7.7%

Radon Program	5	9.6%
Other	5	9.6%

The Healthy Homes program was designed to maintain relationships with community providers through the exchange of referrals. Community partners affiliated with Healthy Homes can expect a greater number of clients enrolled in their related programs due to the referrals from Healthy Homes. Although community partners have inclusion and exclusion criteria specific to their services, for the purposes of this study, participants needed only to be residents of Clark County and own their home to be eligible for enrollment. For this project, no referrals provided to the Healthy Homes program were denied the opportunity to participate in the Healthy Homes program.

Program participants were enrolled in the Healthy Homes program one of two ways: (1) During the initial phone contact or (2) On site, after performing a Lead Risk Assessment. Once enrolled, UNLV research team members scheduled a home visit and started the Healthy Homes program procedures. If for any reason the referred household could not be reached or was no longer interested in participating in the pilot study, the case was closed and accompanying data, for the purpose of this study, was elminated.

Consent

Once the site visit was scheduled, generally three or more UNLV graduate students went to the home to perform the Healthy Homes and Lead Risk Assessment. Program staff and graduate students entering the home were accompanied by at least one team member who was a certified Healthy Homes Specialist by the National Environmental Health Association (NEHA) as well as at least one Lead Risk Assessor as credited by the Environmental Protection Agency (EPA). At the time of the first home

visit, informed consent was obtained from the primary resident (i.e. owner of the home or adult member of the household) and all child participants over the age of 7 were assented. Liability waivers and HIPAA release forms were also signed at this time. The liability waivers were used to protect research team members from liability issues due to damage or injury that could have occurred while onsite. The HIPAA release forms allowed information about any housing hazards and health conditions identified in the home to be forwarded to community partners. Forwarding this information was often necessary to provide further assistance to the residents and was required to arrange any additional services that were needed. The consent and assent forms, as well as the liability waiver, are attached for viewing (See Appendix 6).

Collection of Data

At the time of the first home visit, after consent was obtained, research team members administered a Healthy Homes and Lead Risk Assessment (See Figure 3). The Healthy Homes and Lead Risk Assessment included a room-to-room investigation in which Healthy Homes team members did a visual assessment on the home to identify any housing hazards and health conditions present during that time. The Healthy Homes and Lead Risk Assessment also included questionnaires that were used as assessment tools to identify and record any hazards found in the home. A description of the assessment tools and the sequence of project activities are outlined and illustrated hereafter.

At the initial home visit, residents completed the Education Assessment tool (Appendix 1). The Education Assessment tool included 51 questions designed to measure residents' understanding of home-based hazards and health conditions, as well as one's understanding of relevent prevention strategies. The questions followed a true/false and

multiple choice format. Education Assessment played a vital role in this project, but did not serve as a practical medium to test hypothesis three (i.e. knowledge related to creating and maintaining a healthy home) as originally planned. Limitations of the Education Assessment and its relation to hypothesis four are discussed in the 'Findings of the Study' and the 'Summary, Conclusion, and Recommendations' sections.

During the first home visit, research team members also administered the Resident Questionnaire and Health Assessment (See Appemdix 2 and 3). The Resident Questionnaire was given only to the primary resident (i.e. home owner) whereas the Health Assessment was administered to all residents of the home who desired to participate. The Resident Questionnaire obtained self-reported data on housing hazards and health conditions. The Health Assessment inquired about the most common home-related health conditions and concerns, as indicated by the Centers for Disease Control and Prevention (CDC). Some of these topics include poisioning prevention, indoor air quality, diet and exercise, and unintentional injury. As part of the Health Assessment, the Asthma Supplement was administered when one or more residents of the home had asthma. In addition, the Injury Supplement was administered to residents under the age of 6 or elderly individuals over age the age of 65.

Following the administration of the Education Assessment, Resident Questionnaire, and Health Assessment at least two individuals from UNLV completed a visual assessment on the home (Appendix 4). The Visual Assessment included the completion of checklist created by Healthy Homes team members as a tool to identify and document hazards present in the home. The Visual Assessment was a room-to-room investigation in which Healthy Homes team members, checked moisture, temperature,

and carbon monoxide levels of the home and identified any housing hazards and health conditions present in the home. In addition, an X-Ray Fluorescence (XRF) machine was used to detect any lead-based paint in the homes built prior to 1978 (See Appendix 5). The Visual Assessment served as the mechanism through which researchers planned to test the fourth hypothesis regarding the hazard density score of each participating home. The Education Assessment, Resident Questionnaire, Health Assessment, Visual Assessment and the IRB Protocol for this study are attached as appendices for viewing. Figure 3 depicts the sequence of events that occurred during visit one.

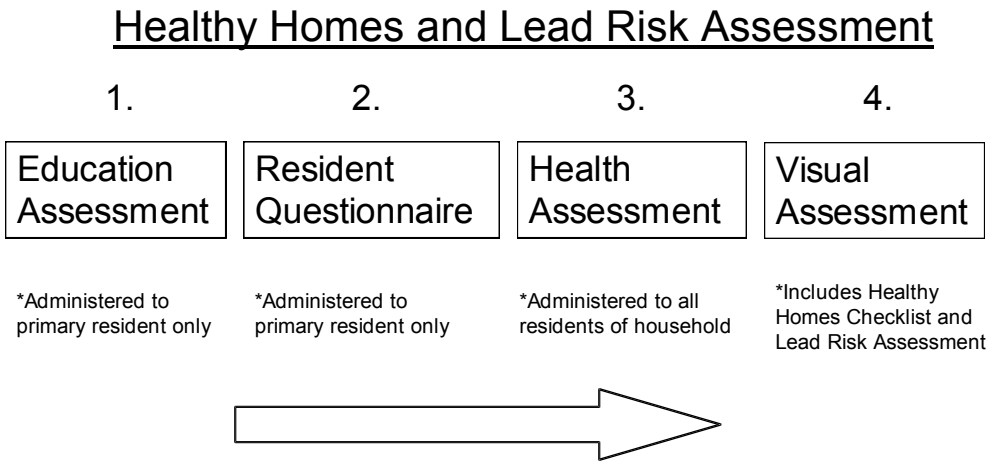

Figure 3. Sequence of Events for Visit 1

Researchers involved with this pilot test anticipated great variation in the housing hazards and health conditions identified in each of the homes visited. Three levels of intervention were established to determine the delivery of program services to program participants: Basic, Facilitated, and Intensive. Although interventions were standardized by these three levels, interventions were taylored to each individual household while still meeting grant requirements. Peer reviewed literature in this area indicate that a one-size-

fits-all approach to education is not effective. People learn in different ways and a variety of activities and materials lead to more effective learning (Thompson, 2006; Hanaki, Sethi, Erev & Peterhansl 2004; Riley & Haynes 2007). This pilot project was designed to educate individuals in a personal yet systematic manner while still providing consistent information and useful resources to all program participants.

After the initial home visit, intervention levels were determined depending on the amount and severity of hazards identified during visit one. The 'Basic' intervention level focused on education and was given to each participating household as a standard procedure. For the purposes of this project, "education" included a standard booklet of information related to creating and maintaining a healthy home, created by Healthy Homes specialists at UNLV and the Southern Nevada Health District. In addition verbal instructions were given on how to fix or prevent hazards identified during the visual assessment. The 'Facilitated' level of intervention included a device intervention and provided items such as carbon monoxide detectors, mops, and buckets. These were provided on an as needed basis. The 'Intensive' level of intervention included home remediation which was provided to qualifying households by community partner RBT and their contractors.

After each case was carefully considered and matched to the appropriate priority and intervention level, research team members completed an intervention form indicating the determined intervention and priority level for each case. The intervention form identified any devices needed and/or provided, and documented any scheduled remediation. Table 11 describes the prioritization criteria and intervention levels that were used in this pilot project. All homes in this study qualified for priority level 1 and 2.

Table 11. Prioritization Criteria and Intervention Levels

Priority Level	Criteria	Intervention Level	Intervention
1	Homes with one or all of the following criteria are considered low priority for services through Healthy Homes: • The health and safety of individuals in the home are not in danger. • No evidence of pests. • No evidence of mold or mildew. • Hazards for trips and falls are not present. • Home is orderly and free of all or most Healthy Homes issues. • The family clearly has the means to fix any problems in their home.	**Basic**	**Educational Materials.** This intervention is given to all participating households regardless of any problems identified. The client will be given information to help him or her in the future if a problem does arrive and will be given a list of additional resources related to creating and maintaining a healthy home environment.
2	Homes with one or all of the following criteria are considered moderate priority for services through Healthy Homes: • Children or elderly live in the home, but immediate health is not in danger. • Evidence of pests is seen sometimes but not on a regular basis. • Mold or Mildew (musty smell) is identified. • Hazards for trips and falls are present, but caution and preventative action has been given. • Any of the healthy homes issues identified were corrected and/or relevant advice was given onsite. This would include setting the water heater to 120□F, moving cleaning supplies to an area out of the reach of children, or advising the client to take caution such as in the case of an absent pool fence or barrier.	**Facilitated**	**Education and device.** This intervention may include items such as a bucket and mop, a smoke detector, or first aid kit. Team members aim to provide program participants with tools to assist them in making their homes safer and healthier. These items are provided to clients based on the assessment tools completed on the initial home visit.
3	Homes with one or all of the following criteria are considered top priority for services through Healthy Homes: • Children or elderly live in the home and their immediate health is in danger. • Evidence of pests is routine. • Mold can be seen. • Heating or AC system does not function. • There are openings in the roof or walls that could lead to unwarranted entry and therefore make the home unsafe.	**Intensive**	**Education and Remediation.** In homes where serious structural damage and health hazards are identified, remediation will occur. This may include installing a heating and cooling system, replacing a roof, or fixing electrical components in the home.

Research team members returned to each home for follow up visits. The initial follow up visit served primarily as an educational session. Standard educational materials were given to the primary resident of each participating household, containing additional information and resources that can be used in the future as needed. The educational materials that were provided included information concerning asthma and the 7 Principles of Healthy Homes as established by the National Center for Healthy Housing. As stated previously, these 7 core principles include: Keep it Dry, Keep it Clean, Keep it Pest-Free, Keep it Safe, Keep it Contaminant-Free, Keep the Air in Your Home Fresh (Keep it Ventilated), and Keep it Maintained. The educational materials also included a Keep it Green section, focusing on instructions for improving energy efficiency and reducing energy consumption (See Appendix 1). During visit two, participants also

received intervention for which they qualified during the prioritization process. Additional information was also provided regarding further resources and remediation services that were available when appropriate. Rebuilding Together (RBT) worked with program participants that were eligible for the intensive intervention to provide the remediation services for some or all of the hazards identified during the Healthy Homes and Lead Risk Assessment. Remediation activities were completed according to RBT funding availability and qualification criteria.

The third and final home visits took place 4-6 months after the initial home assessment. Research team members performed post-intervention assessments to determine whether action was taken and conditions in the home had improved. These post-intervention assessments were the same assessments that were conducted pre-intervention during visit one. Figure 4 provides a summary of the sequence of events that took place for each household that participated in the Healthy Homes pilot test.

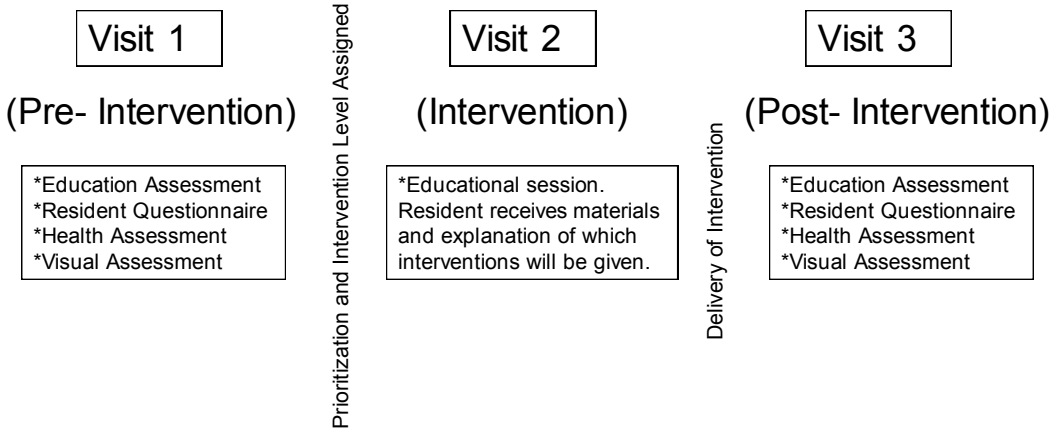

Figure 4. Sequence of Program Events

At the completion of the third visit, homeowners were given a $50 gift card to Walmart for participating in the study. Participants were encouraged to use the $50 gift card to Walmart for the purchase of additional home maintenance supplies. Each of the program activities described previously is essential to the success of the Healthy Homes program. The Healthy Homes program seeks a comprehensive approach to health and the home environment and each program activity is vital to that pursuit.

Addressing Hypotheses

This section states each of the four hypotheses included in the *Identifying and Correcting Health Hazards in the Home: A Pilot Test Among Homes in Clark County, Nevada* project and provides a brief description of the methodology chosen to test each hypothesis. The information gained by addressing each of these hypotheses was useful in evaluating the effectiveness of the Healthy Homes program.

1. Self-reported ratings of home safety will increase among residents of Clark County after participating in the Healthy Homes pilot program.

By conducting a Healthy Homes and Lead Risk Assessment, team members identified structural hazards and health conditions in the home, after which, residents participating in the Healthy Homes pilot program received specific tools to fix or eliminate one or more of the hazards identified (See Table 11). Before and after the removal of these hazards took place and related intervention activities were complete, as described in Table 11, a pre- and post- intervention assessment was used to measure changes in home safety perception pre- and post- intervention. Self reported ratings of home safety were measured pre- and post- intervention (i.e. during the first and third home visits) using a

Likert-Scale and later analyzed using a Wilcoxon Signed Ranks Test. The sample and characteristics of the distribution related to hypothesis one are described in the statistical analysis portion of this study.

2. Self-reported ratings of overall home satisfaction will increase among residents of Clark County after participating in the Healthy Homes pilot program.

To measure changes in self-reported ratings regarding overall home satisfaction, researchers used a Likert-scale, pre- and post- intervention (i.e. during the first and third home visits). A Wilcoxon Signed Ranks Test was used to measure changes that occurred regarding one's overall home satisfaction, pre- and post- intervention. The sample and characteristics of the distribution related to hypothesis one are described in the statistical analysis portion of this study.

3. Knowledge of factors related to creating and maintaining a healthy home, will improve among Clark County residents participating in the pilot test of the Healthy Homes program, after receiving program educational materials

The educational materials were designed to be short and easy to read, yet informative. After much review and revision, the educational materials offer a comprehensive explanation for problems that frequently occur in the home environment and impact one's health and quality of life. After reading these materials, knowledge regarding factors related to creating and maintaining a healthy home environment was predicted to improve. Originally, researchers planned to measure knowledge by the number of questions answered correctly on the Education Assessment. Researchers planned to use a paired t-test to measure any statistically significant difference between means that may

exist, pre- and post- educational intervention delivery. Due to limitations that arose during the study, researchers were not able to accurately test this hypothesis and changes in knowledge among program participants pre- and post- intervention were not measured. These limitations are described in the 'Analysis of Data' section.

4. The hazard-density scores obtained from each home assessment will decrease among residents of Clark County participating in the pilot test of the Healthy Homes program.

Researchers planned to test the prediction that participating households would have lower hazard density scores, pre- and post- intervention. After being informed of any hazards present in the home, and after receiving educational materials and tools to correct and prevent the hazards identified, program participants were likely to implement changes in behavior to help eliminate and prevent the hazards and safety issues identified. A lower number of hazards in the home would result in a lower hazard density score for that household. An actual hazard density score for each household was not obtained due to specific limitations described hereafter.

Treatment of Data

After each home visit, UNLV team members discussed the sequence of events that occurred and the interventions that were provided. The events of every case were recorded and reviewed by multiple team members. Once all questionnaires and follow up visits were complete, the case was finished and a member of the research team at UNLV closed out the file. At this point data was entered into SPSS, a statisical analysis program. All information for each case is stored in secured databases and locked file cabinets.

CHAPTER 4

RESULTS OF THE STUDY

Description of Completed Cases

As stated previously, of the 52 homes that enrolled in the pilot test of the Healthy Homes program, 23 households completed the entire program. Table 12 below provides a description of the 23 households that completed all three Healthy Homes visits.

Table 12. Descriptive Variables of Enrolled Households that Completed All Program Activities Related to the Pilot Test of Healthy Homes (N=23)

Case #	Zip Code	Age of Primary Resident	Gender	Educational Attainment	Insurance	Race
HH.001.11	89145	81	F	Some College	Private	White
HH.002.11	89032	66	F	Some College	Medicare	Black
HH.003.11	89032	96	M	5th Grade	Medicare	Black
HH.004.11	89107	57	F	12th Grade	Private	White
HH.005.11	89115	74	M	GED Certificate	Medicare	White
HH.007.11	89146	71	F	GED Certificate	Medicare	White
HH.008.11	89014	66	F	GED Certificate	Medicare	White
HH.011.11	89145	64	F	12th Grade	Medicare	White
HH.015.11	89102	47	M	Some College	None	White
HH.016.11	89103	42	M	Some College	None	Lebanese
HH.017.11	89135	38	M	College Graduate	Private	Hispanic
HH.018.11	89106	74	F	Some College	Medicare	Black
HH.019.11	89101	78	F	Vocational School	Medicare	White
HH.021.11	89104	76	M	Vocational School	Medicare	Black
HH.027.11	89110	69	M	Vocational School	Medicare	Black
HH.028.11	89148	67	M	College Graduate	Medicare	Greek
HH.029.11	89131	71	F	Some College	Medicare	White
HH.032.11	89106	53	F	Some College	Private	Black
HH.033.11	89030	70	F	12th Grade	Medicare	Black
HH.035.11	89106	59	F	GED Certificate	None	White
HH.041.11	89142	27	F	College Graduate	Private	White
HH.043.11	89106	58	F	12th Grade	Private	Black
HH.048.11	89107	66	M	College Graduate	Private	White

As shown in Table 12 above, participants that completed the pilot test of the Healthy Homes were located in 18 different zip codes throughout Clark County. These 18 zip

codes include 6 of the 11 zip codes selected as target areas for this project. Table 13 below provides further insight on the characteristics of the 23 cases that completed all three Healthy Home visits.

Table 13. Age, Gender, and Race of Enrolled Participants that Completed All Program Activities Related to the Pilot Test of the Healthy Homes Program (N=23)

Age			Gender			Race		
18-27	1	4.3%	**Female**	14	60.9%	**Black**	8	34.8%
28-44	2	8.7%	**Male**	9	39.1%	**White**	12	52.2%
45-62	5	21.7%				**Hispanic**	1	4.3%
63+	15	65.2%				**Other**	2	8.7%

Of the 23 participants that achieved program completion, most were above age 63, most were women, and most were White or Caucasian. The least represented age group was for individuals between the ages of 18 and 27, and those of Hispanic descent were least likely to complete the program. Table 14 illustrates, in greater detail, the educational attainment and health insurance coverage of the 23 households that achieved program completion.

Table 14. Educational Attainment and Health Insurance Coverage of Enrolled Participants that Completed All Program Activities Related to the Pilot Test of the Healthy Homes Program (N=23)

Educational Attainment			Health Insurance Coverage		
< 12th Grade	1	4.3%	**Medicaid/Medicare**	8	34.8%
High School/GED Certificate	8	34.8%	**Private/Other**	12	52.2%

Some College	7	30.4%	**None**	3	13.0%
College Graduate	4	17.4%			
Vocational School	3	13.0%			

The majority of primary residents that completed the study did graduate from high school and many also completed some college. Of these primary residents, 87% did have some type of health insurance coverage. The results shown in Tables 12, 13, and 14 reveal characteristics that were common among those participants that completed the pilot test of the Healthy Homes program.

Analysis of Data

This section states each of the four hypotheses included in the *Identifying and Correcting Health Hazards in the Home: A Pilot Test Among Homes in Clark County, Nevada* project and provides a brief description of the statistical procedures used to analyze data related to each hypothesis.

1. Self-reported ratings regarding the overall safety of the home will increase among residents of Clark County after participating in the Healthy Homes pilot program.

The Resident Questionnaire, completed by the primary resident pre- and post-intervention, was the instrument used to address hypothesis one. Figure 5 below depicts the Likert-scale used to measure self-reported home safety ratings.

1. On a scale of 1 to 10 (with 1 being the worst and 10 being the best, how would you rate the overall safety of your home? (Circle the number).

1----------2---------3---------4---------5---------6---------7---------8---------9--------10

Unsafe Average Safe

Figure 5. Home Safety Rating Scale from Resident Questionnaire

The self-reported home safety ratings, obtained pre- and post- intervention (i.e. during the first and third visit), are listed in Table 15 below.

Table 15. Pre- and Post- Intervention Self-reported Ratings for Home Safety

Case #	Pre	Post	Change
HH.001.11	7	8	Increase
HH.002.11	6	10	Increase
HH.003.11	7	8	Increase
HH.004.11	9	9	Same
HH.005.11	8	9	Increase
HH.007.11	8	4	Decrease
HH.008.11	8	10	Increase
HH.011.11	8	10	Increase
HH.015.11	7	8	Increase
HH.016.11	6	8	Increase
HH.017.11	7	7	Same
HH.018.11	9	10	Increase
HH.019.11	6	8	Increase
HH.021.11	8	10	Increase
HH.027.11	6	9	Increase
HH.028.11	7	8	Increase
HH.029.11	4	9	Increase
HH.032.11	9	8	Decrease
HH.033.11	8	10	Increase
HH.035.11	10	10	Same
HH.041.11	9	9	Same
HH.043.11	6	4	Decrease
HH.048.11	10	9	Decrease

As illustrated above, very few individuals reported a decrease in the safety of their home and most individuals did feel safer after the interventions were provided.

A Wilcoxon Signed Rank Test (n=19) was used to measure the differences in medians of the self-reported levels of home safety, before and after the intervention was provided. A greater post-intervention median indicates that as a group, program participants felt that their home was safer after receiving the program intervention(s). Table 16 below provides the results of the statistical procedures used to measure hypothesis one.

Table 16. Wilcoxon Signed Rank Test Results for Self-reported Home Safety Ratings

	N	Mean	Std. Deviation	Min.	Max.
Home Safety Ratings Pre- Intervention	23	7.52	1.47	4	10
Home Safety Ratings Post- Intervention	23	8.4	1.66	4	10
α	.05	Difference between pre- and post- intervention medians, is statistically significant.			
Z	-2.307				
P value	.021				

With $\alpha = .05$, researchers found the difference in medians between pre- and post-intervention home safety ratings to be statistically significant, with self-reported home

safety ratings increasing approximately one point pre- and post intervention (Z = -2.307, P =.021). In general, the Healthy Homes program helped improve self-reported ratings of home safety.

2. Self-reported ratings regarding the overall home satisfaction will increase among residents of Clark County after participating in the Healthy Homes pilot program.

The Resident Questionnaire, completed by the primary resident pre- and post-intervention, was the instrument used to address hypothesis two. Figure 6 below depicts the Likert-scale used to measure self-reported overall home satisfaction ratings.

1. On a scale of 1 to 10 (with 1 being the worst and 10 being the best, how would you rate your overall satisfaction with your home? (Circle the number).

1----------2---------3---------4----------5---------6--------7---------8---------9--------10

Unsatisfied Average Satisfied

Figure 6. Overall Home Satisfaction Rating Scale from Resident Questionnaire

With the removal of hazards in the home related to health and safety, and the completion of appropriate remediation activities, researchers predicted higher self-reported ratings regarding the overall satisfaction with one's home, as measured by the Resident Questionnaire. Table 17 below displays the self-reported ratings for overall home satisfaction from the 23 households that completed the study.

Table 17. Pre- and Post- Intervention Self-reported Ratings for Overall Home Satisfaction			
Case #	**Pre**	**Post**	**Change**
HH.001.11	9	8	Decrease
HH.002.11	3	8	Increase
HH.003.11	8	9	Increase
HH.004.11	10	9	Decrease
HH.005.11	9	10	Increase
HH.007.11	8	7	Decrease
HH.008.11	8	10	Increase
HH.011.11	8	4	Decrease
HH.015.11	7	8	Increase
HH.016.11	8	10	Increase
HH.017.11	7	7	None
HH.018.11	6	10	Increase
HH.019.11	7	7	None
HH.021.11	8	10	Increase
HH.027.11	7	9	Increase
HH.028.11	8	10	Increase
HH.029.11	2	10	Increase
HH.032.11	6	7	Increase
HH.033.11	6	10	Increase
HH.035.11	8	5	Decrease
HH.041.11	8	8	None
HH.043.11	2	3	Increase
HH.048.11	10	9	Decrease

In regards to overall satisfaction with one's home, few individuals reported a decrease in the satisfaction with their home and most individuals did feel either equally satisfied or more satisfied with their homes after the interventions were provided.

A Wilcoxon Signed Rank Test (n=20) was used to measure the differences in medians of the self-reported levels of overall home satisfaction, before and after the intervention was provided. A greater post-intervention median indicates that as a group, program participants were more satisfied with their home after receiving the program

intervention(s). Table 18 below provides further detail on the statistical procedures used to measure hypothesis two.

Table 18. Wilcoxon Signed Rank Test Results or Self-reported Overall Home Satisfaction Ratings, Pre- and Post- Intervention

	N	Mean	Std. Deviation	Min.	Max.
Overall Home Satisfaction Ratings Pre- Intervention	23	7.08	2.17	2	10
Overall Home Satisfaction Ratings Post- Intervention	23	8.17	2.01	3	10
α	.05	Difference between pre- and post- intervention medians, is statistically significant.			
Z	-2.004				
P value	.045				

With $\alpha = .05$, researchers found the difference in medians between pre- and post-intervention ratings for overall home satisfaction to be statistically significant, with self-reported ratings of overall home satisfaction increasing approximately one point after intervention delivery ($Z = -2.004$, $P = .045$). In general, the Healthy Homes program helped improve self-reported ratings of overall home satisfaction.

3. Knowledge of factors related to creating and maintaining a healthy home, will improve among Clark County residents participating in the Healthy Homes program, after receiving program educational materials.

When this research project was designed, researchers planned to use a paired t-test to measure any statistically significant difference between means of scores on the Education Assessment, pre- and post- educational intervention delivery. A greater post-intervention mean would indicate that as a group, program participants had improved knowledge of factors related to creating and maintaining a healthy home environment after receiving the program intervention(s). The use of the Education Assessment as a measuring tool for knowledge was not possible because of a variety of limitations, thence preventing researchers from accurately testing this hypothesis.

Of the 52 homes that participated in the Healthy Homes program, only 23 completed the third home visit. Of the 23 that did chose to complete the program, less than half completed the Education Assessment on both occasions. Furthermore, in some cases, two different individuals living in the same home completed the Education Assessment. Disability, lack of time, loss of interest, and failure to answer all the questions on the Education Assessment were additional obstacles that made it difficult to accurately measure participants' knowledge of factors related to creating and maintaining a healthy home environment. Table 19 provides a summary of the obstacles that arose regarding the analysis of the Education Assessment.

Table 19. Obstacles Regarding the Analysis of the Education Assessment (N=23)

Incomplete Assessments	Missing Pages	Administered to Different Individuals	Total Completed	Total Completed by Elderly (65 and older)	Assessments Eligible for Analysis
12	2	3	11	6	4
The primary resident did not complete entire assessment.	One or more of the pages from the assessment were missing at the time of administration.	The pre- and post-education assessments were completed by different individuals	The total number of assessments completed by primary resident.	Total number of assessments completed by elderly age 65 and older.	Assessments that, to the knowledge of project team members, were completed according to the original intent of the project.

Of the 23 cases that completed the third visit, 11 completed the Education Assessment. Of the 11 individuals who did complete the Education Assessment pre- and post-intervention, 6 of these 11 were elderly individuals. Several of the elderly individuals that participated in the pilot program had mental and physical disabilities that impacted their ability to perform reasonably on the Education Assessment. In addition, many elderly individuals applied the questions to their own homes rather than the home environment in general, which often indicated a lack of knowledge that was not really present.

Of the 23 homes that completed the pilot program, approximately 4 completed the Education Assessment according to the original intent of the Healthy Homes program. These 4 cases were eligible for analysis based on the premises that the primary resident completed the Education Assessment on the first and third visit and did not show any sign of disability that would inhibit his or her ability to perform reasonably on the Education Assessment. The approximate sample size of 4, or the number of assessments that could be reasonably analyzed, was too small to accurately measure any change in knowledge.

Appropriately scoring each Education Assessment was also problematic. The "check all that apply" instruction, included on several of the questions in the Education Assessment, made it possible for program participants to answer part of a question correctly. In this context, simply marking answers correct or incorrect did not serve as a means to accurately measure knowledge. Furthermore, some questions were written with the intent of having only one correct answer, yet more than one of the options provided could be argued as a correct response. The obstacles listed in Table 19 and the reasons

described above provide clear explanation as to why the Education Assessment was not used to measure knowledge as originally planned.

4. The hazard-density scores obtained from each home assessment will decrease among residents of Clark County participating in the Healthy Homes pilot program. Researchers originally planned to obtain a hazard density score for each participating household. A hazard density score is calculated by the number of hazards identified in the home divided by the square footage of the home in meters squared. Higher hazard density figures indicate a greater presence of hazards identified in the home. Hazard density has been evaluated as a predictor of subsequent visits to the Emergency Medical Department and is an effective measure of exposure to hazards. Researchers were unable to obtain hazard density scores for each household because of several obstacles.

Although each Healthy Homes specialist is trained and certified, the inconsistency that naturally exists among Healthy Home specialists due to the subjective nature of what was considered hazardous, made it difficult to decipher the number of hazards in each home. Furthermore, the square footage for many homes, especially for mobile homes, was unavailable. In addition, many homes contained rooms that were inaccessible to Healthy Homes specialists during one or all home visits. All of these factors made it impractical to use a hazard density score as a measurement for program success and contributed to the inability to test hypothesis four.

Statistical Analysis of Research Questions

After testing the proposed hypotheses and conducting the statistical procedures outlined above, researchers were able to apply findings to answer research questions. Researchers found that among Healthy Homes program participants, self-reported ratings

for both home safety and overall home satisfaction increased significantly (Z = -2.307, P= .021; Z = -2.004, P = .045). Researchers were unable to measure knowledge and changes in hazard density scores as previously planned. The completion of these statistical analyses indicates how self-reported home safety ratings and overall home satisfaction ratings are affected by program participation. Answers to these research questions provide researchers with information regarding the effectiveness of the Healthy Homes program.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Discussion of Results

The results of the *Identifying and Correcting Health Hazards in the Home: A Pilot Test Among Homes in Clark County, Nevada* project demonstrate that the Healthy Homes program was effective at improving self-reported ratings of home safety and overall home satisfaction among program participants. Findings of the *Identifying and Correcting Health Hazards in the Home: A Pilot Test Among Homes in Clark County, Nevada* project demonstrate the positive impact that the Healthy Homes program can have on households that complete the Healthy Homes program. Of the 52 homes that participated in the program for this pilot study, 23 households completed the entire study.

Although self-reported ratings of home safety and overall home satisfaction did increase and changes were statistically significant, differences in medians pre- and post-intervention were somewhat small. For each rating scale, the median increased by approximately one point pre- and post- intervention delivery. On many occasions, Healthy Homes specialists identified problems in the home that were out of the scope of the Healthy Homes project. For this reason, many structural problems were often addressed but not fixed. When problems were identified that were outside the scope of the Healthy Homes program, homeowners were given a resource guide or list of community partners to contact for additional information and assistance. If additional funding, resources, and staffing positions were available for use by the Healthy Homes program, perhaps the improvement in self-reported ratings for home safety and overall

home satisfaction would be even greater. Table 20 below provides a summary of the interventions and devices given to households that participated in the Healthy Homes program during this pilot test.

Table 20. Intervention Levels and Device Distribution Among Participating Households

Intervention Level	**Number of Households Eligibile**
Basic	52
Facilitated	52
Intensive	N/A
Device	**Number Provided**
Buckets, Mops, and Brooms	20
Carbon Monoxide Detector	42
Cleaning Supplies (i.e. cleaning solution and cloths)	22
First Aid Kit	29
Integrated Pest Management (IPM) Supplies (i.e. bait, sticky traps, boric acid and/or caulking)	21
Smoke Detector	30
Garbagecan with Lid	7
Fire Extinguisher	30
Energy Saving Kit	19
Walmart Gift Card ($50)	23

In all cases, the facilitated level of intervention was provided, meaning the participating hosuehold receivied an educational packet, vocal instructions on how to improve their home, and one or more devices to aid them with any problems identified. The devices listed in Table 16 were provided by the Southern Nevada Health District (SNHD). Each device was instrumental in assisting program participants in creating and maintaining a healthy home environment. The devices listed above combined with the educational packets and vocal instructions given onsite to program participants were well received, as indicated by the improvements in self-reported ratings of home safety and overall home satisfaction.

Strengths and Weaknesses

Strengths

One strength of this project was the number of individuals and families that were able to participate in this project. Through this project, the Healthy Homes Program assisted more than 52 households and conducted at least 130 home visits. Each program participant received one of more interventions to improve the health and safety of their home and to enhance quality of life.

In addition, the *Identifying and Correcting Health Hazards in the Home: A Pilot Test Among Homes in Clark County, Nevada* project initiated a large database of data related to health and the home environment. Although not all of the data collected during this project were analyzed for the purposes of this research project, a large collection of data regarding health and the home environment in Clark County is now available for future study, analysis, and use.

This project was also useful in building and strengthening relationships with new and existing community partners. When this project was in its initial stages of development, project team members assumed that clients from Rebuilding Together (RBT) would be the main source of referrals for the Healthy Homes program. This project facilitated the building and strengthening of relationships among additional community partners, with referrals from 11 different entities, resulting in a larger network of community partners that are now active participants in the Nevada Healthy Homes Partnership.

Weaknesses

Some weaknesses and problems did arise throughout the duration of this study, many that could not be directly controlled by the research team. One weakness of this project was the small sample size. The small sample size can be attributed largely to the inherent timeline encompassed by the design of the Healthy Homes program. Because program participation was generally spread over a duration of 4-6 months, many participants chose to withdraw from the study. A variety of reasons contributed to the drop out rate of this project including people simply losing interest in the program, homeowners moving away, or the absence of a working telephone number. Limited staffing also contributed to the small sample size. With just a few Healthy Homes specialists, tasks related to program administration and delivery outnumbered the number of tasks that could reasonably be accomplished by the research team.

The *Identifying and Correcting Health Hazards in the Home: A Pilot Test Among Homes in Clark County, Nevada* project was originally intended to serve low-income populations. Because of the vast characteristics of our partners, many participants that were referred into the program were from homes of high socioeconomic statuses in terms of income and housing. The stark difference in living conditions between low-income homes and those of higher socioeconomic status may have skewed results especially considering the small size of the sample.

Additional weaknesses of this project were also seen in the administration of the Education Assessment. On several occasions the homeowner was physically or mentally incapable of taking the pre-test. In some cases, individuals chose not to take the education assessment because of limited time. Furthermore, of those who did choose to take the

education assessment, many did not complete the entire questionnaire. A large number of the education assessments were not able to be scored for these reasons, making it impossible at this time to draw appropriate conclusions or assumptions on hypothesis three regarding the possible change in knowledge of factors related to creating and maintaining a healthy home environment.

Sharing of Findings

Team members and community partners will share findings obtained from this pilot test at upcoming, relevant meetings and conferences. Suggestions for improvement, effective strategies related to program administration, and program deficiencies identified through this project, have already been shared with project managers and community partners and will continue to be shared in situations that are appropriate and relevant. In addition, limitations of this project have also been discussed in preparation for the continuation of the Healthy Homes program.

To encourage and ensure the appropriate use of project results, data sets will remain confidential and will be stored in secure file cabinets and electronic databases. Original electronic files will be guarded with copyright locks and summary reports will be circulated only to those within the scope of the Healthy Homes program. General reports and summaries of results from this project may be helpful in securing future funding and will be disseminated to other non-profit or professional organizations expressing interest in such data.

Conclusions and Recommendations for Further Study

By modifying the home environment, the Healthy Homes program has the potential to improve the health and quality of life of thousands of people living in Clark

County. This pilot test was an essential step to effective program implementation and is the foundation from whence positive health outcomes will be produced.

After considering the strengths and weaknesses identified through this pilot test, researchers recommend implementing several elements of change to improve program effectiveness. First, a larger research team, as well as additional staff members in the future, would aid in the timeliness of program activities. The ability to accomplish more tasks in a given period of time would likely increase the number of homes that could be served by the healthy homes program.

Second, new inclusion and exclusion criteria for program eligibility need to be established. The Healthy Homes program was originally designed to serve low-income families, however not every participating household in this study fit this intended audience. Several participating households were referrals from entities that served individuals and families from backgrounds of higher socioeconomic status. Homes that were in wealthy areas tended to have fewer Healthy Homes issues and were less likely to benefit from the program, as compared to households of lower socioeconomic status. In order to more effectively use program resources and better serve the intended population, specific criteria for program participation related to household income need to be developed and clearly stated.

In the future, the Education Assessment needs to be revised so that it is written in a more clear and comprehensive manner. Some clients did not understand certain questions or felt that some options for answers were unclear or overlapping. In addition, the large number of questions included in the Education Assessment contributed to a low

completion rate. The completion rate of the Education Assessment would likely improve if the Education Assessment was more concise.

The encompassing nature and holistic approach taken by Healthy Homes provide ground for future research in a variety of areas. The *Identifying and Correcting Health Hazards in the Home: A Pilot Test Among Homes in Clark County, Nevada* project did not collect as much data from individuals with asthma as originally anticipated. A final suggestion for change is to develop a more effective way to reach people with asthma. The development and control of asthma is greatly influenced by the home environment, yet researchers identified very few individuals with asthma throughout the duration of this pilot test. Including asthma in the program eligibility criteria might be useful in gaining more information on people living with asthma in Clark County. Additional research on asthma in the Las Vegas area would be useful in targeting populations with asthma and providing people with interventions related to asthma control.

Additional research is also needed to determine which structural hazards are most common in Las Vegas homes so that resources can be secured to address those issues. In time, the Healthy Homes program may be useful in accomplishing this pursuit, however having this information sooner rather than later would be useful as research team members apply for additional grants and funding opportunities.

The Healthy Homes program is not only a powerful tool in collecting data related to healthy housing but also a sustainable entity providing valuable services to families and communities in Clark County. The *Identifying and Correcting Health Hazards in the Home: A Pilot Test Among Homes in Clark County, Nevada* project included the implementation and early stages of the Healthy Homes program in Clark County and will

serve as a tool to improve and continue the Healthy Homes program in the future. By identifying and addressing conditions in the home environment, the Nevada Healthy Homes program will be able to improve the health of Nevada residents, particularly those in disadvantaged communities.

APPENDIX 1

Education Assessment

The following questionnaire was created by Mackenzie Burns, Erika Marquez, and Sabrina La Monica under the direction of Dr. Shawn Gerstenberger at the University of Nevada Las Vegas, Department of Environmental and Occupational Health, 4505 Maryland Parkway, Box 45063, Las Vegas, Nevada, 89154. Input from community partners in the areas of health and housing was vital to the development of this questionnaire.

This questionnaire will be administered to the primary resident of the home and has been approved by the UNLV Office for the Protection of Research Subjects prior to use.

For additional information regarding this protocol, please call 702-895-5420.

If you use materials from this questionnaire, please let us know by sending an email to shawn.gerstenberger@unlv.edu.

Thank you!

Healthy Homes Education Assessment

Case #: _____

Date of Assessment: _____ □ Pre- □ Post-

Name:_____

For all of the following questions, please read the directions carefully:

1) Too much moisture in or around your home may result in: (Check all that apply).
   - ☐ Structural damage
   - ☐ Increased fire danger
   - ☐ Mold growth
   - ☐ Pest infestation
   - ☐ Build up of hazardous chemicals

2) True or False: Condensation on the cold surfaces of mechanical equipment may be a source of moisture in your home. (Circle one response).
   - a) True
   - b) False

3) The best direction for sprinklers or irrigation systems to point is: (Circle one response).
   - a) Towards the foundation of the home
   - b) Away from the foundation of the home

4) When taking a bath or shower, the best way to limit moisture build-up is: (Check all that apply).
   - ☐ To open a window
   - ☐ Remove shower curtains

☐ To turn on the bathroom exhaust fan

☐ Lay towels on floor before showering or bathing

5) Where in a home can mold grow? (Check all that apply).

☐ On walls

☐ On ceilings

☐ On plastic surfaces

☐ On carpet

☐ On furniture

6) True or False: Keeping your home clean and free of clutter can help keep away pests. (Circle one response).

a) True

b) False

7) What is the best way to keep your home clean? (Circle one response).

a) Wet cleaning (For example: Mopping)

b) Dry cleaning (For example: Dusting or sweeping)

8) What is the best way to prevent allergens in your sleeping environment? (Check all that apply).

☐ Wash bed sheets in hot water

☐ Cover mattresses and pillows in allergen-reducing covers

☐ Wash walls with Ammonia cleaner

☐ Vacuum regularly

☐ Make bed daily

☐ Don't allow pets into bedrooms or onto beds

9) True or False: Regular vacuuming can reduce the collection of dirt, dust, and pet dander. (Circle one response).

a) True

b) False

10) True or False: To get surfaces really clean, you need to use harsh cleaning chemicals like Windex® or Mr. Clean®. (Circle one response).
    a) True
    b) False

11) True or False: Keeping the air in your home fresh may reduce the number of respiratory symptoms or illnesses experienced by your family. (Circle one response).
    a) True
    b) False

12) Which of the following appliances can pollute the air in your home, when they are broken or not installed correctly? (Check all that apply).
    ☐ Water heater
    ☐ Refrigerator
    ☐ Furnace
    ☐ Gas-burning stove
    ☐ Microwave
    ☐ Clothes dryer

13) True or False: Smoking cigarettes or a cigar inside the home does NOT pollute the air. (Circle one response).
    a) True
    b) False

14) How often should you change the air filters for your home air conditioning/heating system? (Circle one response).
    a) Once every 6 months
    b) Once every 3 to 6 months
    c) Once every 1 to 3 months

d) Once every 2 weeks

15) True or False: Pests, (such as cockroaches, mice, rats, and pigeons), can carry diseases and can make your family sick. (Circle one response).
   a) True
   b) False

16) How do pests usually enter a home? (Check all that apply).
   ☐ In shoes worn into the home
   ☐ In fruits and vegetables from the grocery store
   ☐ Unsealed cracks and small openings
   ☐ Open windows without screens
   ☐ In potted plants

17) What is the safest way to discourage pests from living in your home? (Check all that apply).
   ☐ Eliminate their access to food, by keeping food in air-tight containers
   ☐ Use spray pesticides frequently
   ☐ Fill empty milk jugs with water and place them around the home exterior
   ☐ Remove clutter and regularly clean the home
   ☐ Use indoor fogger pesticide sprays only twice per year

18) True or False: Pesticides are poisonous chemicals and are especially dangerous to pregnant women, children, and pests. (Circle one response).
   a) True
   b) False

19) What is a common type of injury (or injuries), which may occur within the home? (Check all that apply).
   ☐ Falls
   ☐ Poisonings

- ☐ Choking/Suffocation
- ☐ Drowning

20) Small children can drown in standing water that is only: (Circle one response).
   a) 3 feet deep
   b) 1 foot deep
   c) 6 inches deep
   d) 2 inches deep

21) True or False: Overused power outlets and power strips can cause fires in the home. (Circle one response).
   a) True
   b) False

22) Which of the following can be a suffocation hazard for small children? (Check all that apply).
   - ☐ Mini-blind cords
   - ☐ Items larger than 1½ inches around
   - ☐ Sleeping in the same bed with another person
   - ☐ Steamed vegetables

23) Many devices can help keep your family safe from injuries in the home, which of the following are examples of such safety devices? (Check all that apply).
   - ☐ Smoke detectors
   - ☐ Carbon monoxide detectors
   - ☐ Area rugs in kitchens and bathrooms
   - ☐ Fire extinguishers
   - ☐ Cabinet latches
   - ☐ Window guards
   - ☐ Electrical outlet covers

24) At least how many exits should a home fire escape plan have? (Circle one response).

a) No exits need to be identified on a fire escape plan

b) 1 exit

c) 2 exits

d) 3 exits

25) True or False: Water heaters should be set so that the hot water is above 120°F. (Circle one response).

a) True

b) False

26) To prevent drowning hazards, pools and spas should have which safety feature(s)? (Check all that apply).

☐ A completely closed, 4-sided perimeter fence

☐ A plastic pool or spa cover

☐ A fence with a self-closing gate

☐ Stairs or steps for easy entry

☐ A fence with a self-latching gate

27) If firearms are present within the home, how should they be safely stored? (Check all that apply).

☐ In a locked cabinet or gun safe

☐ Loaded with ammunition

☐ Separately from ammunition

28) What are common household contaminants that may be harmful to your health? (Check all that apply).

☐ Tobacco smoke

☐ Carbon monoxide

☐ Radon

☐ Lead

- ☐ Pesticides
- ☐ Cleaning products

29) Where might lead be found within a home? (Check all that apply).

- ☐ Tile
- ☐ No. 2 Pencils
- ☐ Soil
- ☐ Paint
- ☐ Dust
- ☐ Engine Oil
- ☐ Carpeting

30) True or False: Asbestos has been shown to cause some types of cancer. (Circle one response).

a) True
b) False

31) True or False: At dangerous levels, carbon monoxide can be seen and smelled in the air. (Circle one response).

a) True
b) False

32) How should pesticides, cleaners, medications and vitamins, and other chemicals be stored? (Check all that apply).

- ☐ Away from children in locked cabinets
- ☐ Under the kitchen sink
- ☐ Wherever they are most frequently used
- ☐ In their original containers with correct labels

33) True or False: Frequently inspecting, cleaning, organizing, and repairing small problems in your home may reduce serious structural problems in the future. (Circle one response).

a) True
b) False

34) True or False: You should never attempt to repair your furnace or heating/air conditioning system yourself. (Circle one response).

a) True
b) False

35) How often should you change the batteries in your smoke and carbon monoxide detectors? (Circle one response).

a) Once a year
b) Twice a year
c) Every month

36) Routine maintenance of a home may include: (Check all that apply).

☐ Checking the condition of roof shingles or tiles
☐ Replacing carpeting with wood floors
☐ Examining walls and ceilings for sign of water damage
☐ Clearing the yard of clutter and debris

37) Symptoms of asthma may include: (Check all that apply).

☐ Wheezing
☐ Seizures
☐ Coughing
☐ Loud screaming and crying
☐ Chest tightness
☐ Shortness of breath

38) True or False: Tobacco smoke can trigger asthma symptoms or attacks. (Circle one response).

a) True

b) False

39) True or False: Dust mites can trigger asthma symptoms or attacks. (Circle one response).

a) True

b) False

40) True or False: Cockroaches can trigger asthma symptoms or attacks. (Circle one response).

a) True

b) False

41) True or False: Mold can trigger asthma symptoms or attacks. (Circle one response).

a) True

b) False

42) True or False: Pets can trigger asthma symptoms or attacks. (Circle one response).

a) True

b) False

43) What is the best way to manage asthma? (Check all that apply).

☐ Consult with a doctor

☐ Deal with it yourself

☐ Follow an Asthma Action/Control Plan

44) True or False: Not all asthma episodes need to be taken seriously. (Circle one response).

a) True

b) False

45) True or False: Someone with asthma only needs to see a doctor about asthma when he or she is having an attack. (Circle one response).

a) True

b) False

46) True or False: It is best to wait and see if asthma symptoms go away on their own before taking "as needed" medications. (Circle one response).

a) True

b) False

47) True or False: An inhaler will deliver a useful dose of medication, no matter how it is used. (Circle one response).

a) True

b) False

48) True or False: During an asthma attack, it is hard to breathe. (Circle one response).

a) True

b) False

49) True or False: Asthma cannot be cured, but it can be controlled. (Circle one response).

a) True

b) False

50) True or False: People with asthma should not exercise. (Circle one response).

a) True

b) False

51) True or False: There is nothing a person with asthma can do to keep from getting an asthma attack. (Circle one response).

a) True

b) False

APPENDIX 2

Resident Questionnaire

The following assessment was created by Mackenzie Burns, Erika Marquez, and Sabrina La Monica under the direction of Dr. Shawn Gerstenberger at the University of Nevada Las Vegas, Department of Environmental and Occupational Health, 4505 Maryland Parkway, Box 45063, Las Vegas, Nevada, 89154. Input from community partners in the areas of health and housing was vital to the development of this assessment.

This assessment will be completed by a member of the Healthy Homes research team and has been approved by the UNLV Office for the Protection of Research Subjects prior to use.

For additional information regarding this protocol, please call 702-895-5420.

If you use materials from this questionnaire, please let us know by sending an email to shawn.gerstenberger@unlv.edu.

Thank you!

Resident Questionnaire

Case #: _____ Personal ID #: _____

Date of Assessment: _____ ☐ Pre- ☐ Post-

Name of Assessor: _____

1. Owner/Renter Name: _____

2. Street Address: _____

3. City: _____ 4. Zip Code: _____

5. Phone Number: _____ 6. Primary Language: _____

7. Total number of occupants in the home: _____

8. For ALL occupants, complete:

	Age	Gender	Highest Grade Level	Relationship to Respondent
8.1				
8.2				
8.3				
8.4				
8.5				
8.6				
8.7				
8.8				
8.9				
8.10				

*** If there is a child under age 6 or an adult over age 65, complete the Injury Prevention Supplement**

9. Type of home:
   - ☐ Single family
   - ☐ Duplex or townhouse
   - ☐ Apartment or condo
   - ☐ Manufactured home
   - ☐ Other _____

10. Do you own or rent the home?
   - ☐ Own
   - ☐ Rent

11. How many years have you lived in the home? _____

NVHHP complete Construction year from the Clark County Assessor Record: _____

Square footage of the home: _____

12. What was the household's total income **LAST YEAR**? (Have resident select one from list).

☐ Did not work at all last year	☐ Less than $5,000	☐ $5,000 to $9,999
☐ $10,000 to $14,999	☐ $15,000 to $24,999	☐ $25,000 to $34,999
☐ $35,000 to $49,999	☐ $50,000 to $74,999	☐ $75,000 to $99,999
☐ Over $100,000	☐ I don't know	

13. In the last **2 YEARS**, have you or anyone in your household received benefits or used the services of any of the following social programs? (Have resident check all that apply from list).

☐ Temporary Assistance for Needy Families (TANF)		☐ Food stamps
☐ Disability insurance	☐ Unemployment insurance	☐ Social Security
☐ Veteran's pay	☐ General assistance/Welfare	☐ Medicaid
☐ Low income housing	☐ Public health clinic	☐ WIC
☐ Disaster relief	☐ Legal services	☐ I don't know
☐ Pell grants	☐ Other: _____	

15. Is any member of the household disabled? ☐ No ☐ Yes

If No, skip to Question 16

15.1. If yes, please list household member age, gender, and describe their disability: _____

_____

_____

_____

16. Has any member of the household been diagnosed with asthma? ☐ No ☐ Yes

If No, skip to Question 17

16.1. If yes, please list household member age, gender, and their relation to you: _____

_____

_____

_____

17. Has a radon test ever been performed in the home? ☐No ☐Yes ☐I don't know
If No, skip to Question 18

17.1. What were the results of the radon test? _____
☐I don't know

18. Has a lead assessment ever been performed in the home? ☐No ☐Yes ☐I don't know
If No, skip to Indoor Air Quality

18.1. What were the results of the lead assessment? _____
☐I don't know

*** If a Pre-1978 home, complete full RA; if a Post-1978 home, complete abbreviated RA**

Indoor Air Quality----------

1. Does the home have a working central heating/air conditioning unit? (Select one).

☐Yes, there is a working unit ☐Yes, but the unit is not working ☐No, there is no unit
If No, skip to Question 2

1.1. Are the air filters replaced at least every 3 months? ☐No ☐Yes

1.2. Does the unit have a thermostat? ☐No ☐Yes
If No, skip to Question 1.4

1.2.1. Do you know how to work your thermostat? ☐No ☐Yes

1.2.2. What is the average temperature setting of your thermostat in the summer (July/Aug.)?

☐Not applicable ☐I don't know _____°F

1.2.3. What is the average temperature setting of your thermostat in the winter (Dec./Jan.)?

☐Not applicable ☐I don't know _____°F

2. Besides a central heating/air conditioning unit, do you use any of the following to heat or cool your home? (Check all that apply).

☐Space heater ☐Stove/Oven ☐Swamp cooler ☐Electric Fans ☐Other _____

3. What is the average cost of your cooling (gas or electric) bill in the summer (July/Aug.)?

☐Not applicable ☐I don't know $_____/month

4. What is the average cost of your heating (gas or electric) bill in the winter (Dec./Jan.)?

☐ Not applicable ☐ I don't know $_____/month

5. Are humidifiers ever used in the home? ☐ No ☐ Yes
If No, skip to Question 6

5.1. If yes, do you clean the humidifier parts before or after every use? ☐ No ☐ Yes

6. Can mold or mildew be seen or smelled in the home? ☐ No ☐ Yes
If No, skip to Question 7

6.1. If yes, where in the home can mold or mildew be seen or smelled? (Check all that apply).

☐ Front yard	☐ Backyard	☐ Entryway
☐ Living room	☐ Dining room	☐ Kitchen
☐ Adult's bedroom #_____	☐ Child's bedroom #_____	☐ Bathroom
☐ Laundry room	☐ Hallway	☐ Staircase
☐ Garage	☐ Other_____	

7. If there is a fireplace in the home, do you use it? ☐ No ☐ Yes ☐ No fireplace
If No or No fireplace, skip to Question 8

7.1. If yes, do you use the vent damper? ☐ No ☐ Yes ☐ I don't know

8. Are the following appliances vented to the outside of the home?

8.1. Fireplace	☐ No	☐ Yes	☐ I don't know	☐ No fireplace
8.2. Stove/Oven	☐ No	☐ Yes	☐ I don't know	☐ No stove/oven
8.3. Clothes dryer	☐ No	☐ Yes	☐ I don't know	☐ No clothes dryer
8.4. Water heater	☐ No	☐ Yes	☐ I don't know	☐ No water heater

9. Does anyone smoke cigarettes, cigars, or tobacco pipes inside the home? ☐ No ☐ Yes
If No, skip to Question 10

10. Are there pets inside the home? (Check all that apply).

☐ Cat(s) #_____ ☐ Dog(s) #_____ ☐ Other:_____ #_____ ☐ No
If No, skip to Poisoning Prevention

10.1. If yes, are the pets allowed in the bedrooms? ☐ No ☐ Yes

Poisoning Prevention

1. Are any of the following products used in the home?

   1.1. Bleach, ammonia, cleaners, or detergents ☐No ☐Yes ☐I don't know

   1.2. Paints, stains, paint thinners, adhesives, or glues ☐No ☐Yes ☐I don't know

   1.3. Air fresheners, air purifiers, or candles ☐No ☐Yes ☐I don't know

2. How do you usually clean your home? (Check all that apply).

   ☐Sweeping or dry mopping ☐Damp mopping ☐Dusting ☐Vacuuming

3. Does the home have a vacuum? ☐No ☐Yes
   If No, skip to Injury Prevention

   3.1. If yes, does the vacuum have a(n):

   ☐Ultra-filtration bag ☐HEPA-like bag ☐HEPA-like filter
   ☐Other filter or bag ☐HEPA filter ☐I don't know

Injury Prevention

1. On a scale of 1 to 10 (with 1 being the worst and 10 being the best, how would you rate the overall safety of your home? (Circle the number).

   1----------2----------3----------4----------5----------6----------7----------8----------9----------10
   Unsafe Average Safe

2. If you have a smoke detector, do you test the batteries monthly? ☐No ☐Yes ☐N/A

3. Is there a fire extinguisher present in the home? ☐No ☐Yes
   If No, skip to Question 4

   3.1. If yes, where is the fire extinguisher located? (Check all that apply).

   ☐Kitchen ☐Bathroom ☐Outside storage
   ☐Garage ☐Other _____

4. If you have a carbon dioxide detector, do you test the batteries monthly?
   ☐No ☐Yes ☐N/A

Structural Elements of the Home

1. On a scale of 1 to 10 (with 1 being worst and 10 being best), how would you rate your overall satisfaction with your home? (Circle the number).

1---------2---------3---------4---------5---------6---------7---------8---------9---------10
Unsatisfied Average Satisfied

2. On a scale of 1 to 10 (with 1 being the worst and 10 being the best), please rank your opinion of your home as it compares to other homes: (Circle the number).

1---------2---------3---------4---------5---------6---------7---------8---------9---------10
Worse than others Average Better than others

3. Are there **currently** any problems with the plumbing in the home? ☐ No ☐ Yes
If No, skip to Question 4

3.1. If yes, what exactly are the problems? _____

_____

_____

_____

3.2. What rooms have the plumbing problems? (Check all that apply).

☐ Living room	☐ Dining room	☐ Kitchen
☐ Adult's bedroom #_____	☐ Child's bedroom #_____	☐ Bathroom
☐ Laundry room	☐ Hallway	☐ Staircase
☐ Garage	☐ Other_____	

4. Are any of the windows in the home **not** able to be opened? ☐ No ☐ Yes
If No, skip to Question 5

4.1. If yes, what are the locations of the inoperable windows? (Check all that apply).

☐ Living room	☐ Dining room	☐ Kitchen
☐ Adult's bedroom #_____	☐ Child's bedroom #_____	☐ Bathroom
☐ Laundry room	☐ Hallway	☐ Staircase
☐ Garage	☐ Other_____	

5. Is there any water damage present in the home? ☐ No ☐ Yes
If No, skip to Question 6

5.1. If yes, what rooms have the water damage? (Check all that apply).

☐ Living room	☐ Dining room	☐ Kitchen
☐ Adult's bedroom #_____	☐ Child's bedroom #_____	☐ Bathroom
☐ Laundry room	☐ Hallway	☐ Staircase
☐ Garage	☐ Other_____	

6. Does the home have properly working rain gutters and downspouts?
☐ No ☐ Yes ☐ I don't know

7. Is there any damage to the roof, such as leaks, sagging, or missing roofing materials?
☐ No ☐ Yes ☐ I don't know
If No or I don't know, skip to Pests

7.1. If yes, describe the type of roof damage: _____
_____
_____

Pests

1. Is all food stored in airtight containers?		☐ No	☐ Yes
2. Is pet food stored in airtight containers and/or off the floor?	☐ No	☐ Yes	☐ N/A
3. Is food ever eaten outside of the kitchen or dining area?		☐ No	☐ Yes
4. Is garbage contained in a sealable indoor trash can?		☐ No	☐ Yes
5. Have cockroaches, other insects, or rodents been seen in the home?		☐ No	☐ Yes
6. Have insect or rodent feces been seen in the home?		☐ No	☐ Yes
7. Have bed bugs been seen in the home?		☐ No	☐ Yes

8. Has anyone in the home experienced bed bug bites? ☐ No ☐ Yes ☐ I don't know

9. Has anyone in the home used pesticides to control pests (sprays, foggers, etc.)?
☐ No ☐ Yes
If No, skip to Question 10

9.1. If yes, when was the last time the pesticides were used? _____

10. Have any professional pest control workers done work inside your home? ☐ No ☐ Yes

If No, skip to Question 11

10.1. If yes, what was the reason for their visit and what did they do? _____

_____

_____

10.2. When was the last time the pest professionals visited the home? _____

11. On average, how often do you wash bed sheets? (Select one).

☐ Once a week ☐ Every 2 weeks ☐ Once a month ☐ Less often than once a month

11.1. When you wash the sheets, do you use hot water? ☐ No ☐ Yes

12. Do your sleeping pillows have dust-proof covers? ☐ No ☐ Yes

Resident Questionnaire Codes

Relationship to Respondent

0 = Spouse/Common law spouse
1 = Own, adopted, or dependent child
2 = Sibling
3 = Parent
4 = Grandchild
5 = Other relative (cousins, uncles, etc.)
6 = Other: _____

Highest Grade Level Completed

0 = Pre-school or kindergarten
1 – 12 = First through twelfth grade, respectively
13 = GED certificate
14 = Vocational school
15 = Some college
16 = College graduate
17 = Graduate school or beyond

What was the household's total income LAST YEAR?

☐ Did not work at all last year
☐ Less than $5,000
☐ $5,000 to $9,999
☐ $10,000 to $14,999
☐ $15,000 to $24,999
☐ $25,000 to $34,999
☐ $35,000 to $49,999
☐ $50,000 to $74,999
☐ $75,000 to $99,999
☐ Over $100,000
☐ I don't know

In the last 2 YEARS, have you or anyone in your household received benefits or used the services of any of the following social programs? (Check all that apply).

☐ Temporary Assistance for Needy Families (TANF)
☐ Food stamps
☐ Disability insurance
☐ Unemployment insurance
☐ Social Security
☐ Veteran's pay
☐ General assistance/Welfare
☐ Medicaid
☐ Low income housing
☐ Public health clinic
☐ WIC
☐ Disaster relief
☐ Legal services
☐ I don't know
☐ Pell grants
☐ Other: _____

APPENDIX 3

Health Assessment

The following questionnaire was created by Mackenzie Burns, Erika Marquez, and Sabrina La Monica under the direction of Dr. Shawn Gerstenberger at the University of Nevada Las Vegas, Department of Environmental and Occupational Health, 4505 Maryland Parkway, Box 45063, Las Vegas, Nevada, 89154. Input from community partners in the areas of health and housing was vital to the development of this questionnaire.

This questionnaire will be administered to the primary resident of the home and any other consenting or assenting adults and children present at the time of the home visit. This questionnaire has been approved by the UNLV Office for the Protection of Research Subjects prior to use.

For additional information regarding this protocol, please call 702-895-5420.

If you use materials from this questionnaire, please let us know by sending an email to shawn.gerstenberger@unlv.edu.

Thank you!

Health Assessment

Case #: _____ Personal ID #: _____

Date of Assessment: _____ ☐Pre-

Name of Assessor: _____

Demographic Data ----------

1. Your (or the child's) name: _____ 2. Age: _____

3. If you are responding for a minor child, what is your relationship to the child? (Select one)
   ☐Biological parent ☐Step-parent ☐Foster parent
   ☐Legal guardian ☐Other: _____

4. What is your (or the child's) race? (Check all that apply.)

☐White	☐Guamanian/Chamorro
☐Black/African American	☐Filipino
☐American Indian/Alaskan Native	☐Vietnamese
☐Asian Indian	☐Chinese
☐Japanese	☐Korean
☐Native Hawaiian	☐Samoan
☐Hispanic/Latino/Spanish	☐Other: _____

5. If you (or the child) are of Hispanic, Latino, or Spanish origin, what is your ethnicity?

   ☐Mexican/Mexican American/Chicano
   ☐Cuban
   ☐Puerto Rican
   ☐Other: _____
   ☐Not of Hispanic, Latino, or Spanish origin

Health Care ----------

1. Do you (or the child) currently have health (medical) insurance? ☐No ☐Yes
If No, skip to Question 2

1.1. What type of health insurance do you (or the child) have? (Select one).

☐Medicaid ☐Medicare ☐Private/Other

1.2. Who pays for the health insurance? (Select one).

☐I pay ☐My spouse ☐My parent
☐My employer ☐My spouse's employer ☐My parent's employer
☐Government ☐Other: _____ ☐I don't know

2. In the **past YEAR**, have you (or the child) used any type of health care services from doctors, nurses, clinics, or hospitals? ☐No ☐Yes
If No, skip to Question 3

2.1. The **last time** you (or the child) used a health care service, where did you (or the child) go? (Select one).

☐Hospital ☐Emergency Room ☐Private Doctor's Office ☐Quick Care
☐Chiropractor ☐Healer "Curandero" ☐Other: _____

3. Do you (or the child) see a dentist at least **one time per YEAR**? ☐No ☐Yes

4. What trouble (if any) do you have getting health care for yourself (or the child)? (Check all that apply).

☐I have never needed health care ☐I don't know
☐I have no transportation/ Too far away ☐I don't know where services are available
☐Services are not open when needed ☐They don't provide services I need
☐They don't speak my language ☐They don't treat me with respect
☐I don't feel welcomed ☐They don't understand my problems
☐I'll lose my job ☐It's too expensive/ I don't have insurance
☐Other: _____ ☐No difficulties or problems getting health care

General Health

1. On a scale of 1 to 10 (with 1 being the worst and 10 being the best, how would you rate your (or the child's) overall health? (Circle the number).

   1---------2---------3---------4---------5---------6---------7---------8---------9---------10
   Poor Average Excellent

2. Does your (or the child's) health currently limit your (or their) ability to perform vigorous physical activities such as: running, lifting heavy objects, and strenuous sports? (Select one).

   ☐No, not limited at all ☐Yes, limited a little ☐Yes, limited a lot

3. Does your (or the child's) health currently limit your (or their) ability to perform moderate physical activities such as: pushing a vacuum, climbing 1 flight of stairs, or playing golf? (Select one).

   ☐No, not limited at all ☐Yes, limited a little ☐Yes, limited a lot

4. On a scale of 1 to 10 (with 1 being the worst and 10 being the best), how would you rate the healthiness of your (or the child's) diet? (Circle the number).

   1---------2---------3---------4---------5---------6---------7---------8---------9---------10
   Unhealthy Average Healthy

5. How many fruits and vegetables do you (or the child) usually eat **per DAY**? _____ items

6. How many times **per WEEK** do you (or the child) usually eat fast food? _____ times

7. How many times **per WEEK** do you (or the child) usually exercise? _____ times
   If zero, skip to Question 8

   7.1. When you (or the child) do exercise, how many minutes are spent? _____ minutes

8. How many hours **per DAY** do you (or the child) usually spend watching television, playing video games, on a cell phone, or on a computer? _____ hours

9. Have you (or the child) **ever** smoked cigarettes, cigars, or used other tobacco products?
   ☐No ☐Yes
   If No, skip to Preventative Care

   9.1. Do you (or the child) **currently** smoke or use tobacco products? ☐No ☐Yes
   If Yes, skip to Preventative Care

   9.2. If no, when did you (or the child) quit? _____

Preventative Care

1. Have you (or the child) ever been tested for exposure to lead, by a blood test?

☐ No ☐ Yes

If No, skip to Question 3

1.1. If yes, where did you (or the child) receive the blood lead test? (Select one).

☐ Health District ☐ Doctor's Office ☐ Laboratory ☐ Other: _____

1.2. If yes, was the blood sample collected by blood draw or the stick of a finger? (Select one).

☐ Blood draw (in a vein) ☐ Stick of finger (capillary)

1.3. What was the resulting blood lead level? ☐ I don't know _____ µg/dL

Quality of Life

1. **For self-report only (Do not answer for the child):** Do you agree or disagree with each of the following statements?

1.1. You seem to get sick a little easier than other people. (Select one).

☐ Strongly agree ☐ Agree ☐ Neither
☐ Disagree ☐ Strongly disagree

1.2. You are as healthy as anybody you know. (Select one).

☐ Strongly agree ☐ Agree ☐ Neither
☐ Disagree ☐ Strongly disagree

1.3. You expect your health to get worse. (Select one).

☐ Strongly agree ☐ Agree ☐ Neither
☐ Disagree ☐ Strongly disagree

Asthma Diagnosis

1. Have you (or the child) ever been diagnosed with asthma, by a healthcare professional?

☐ No ☐ Yes

*** If Yes, complete the Asthma Supplement**

Asthma Supplement

Case #: _____

Personal ID #: _____

☐Pre- ☐Post-

For: All participants with an asthma diagnosis

1. Approximately when was your/ the child's diagnosis? _____

2. Do you/ the child use an Asthma Action/Control Plan, provided from a medical professional?

   ☐No, never given a Control Plan ☐No, have one but don't use it ☐Yes

   2.1. When was the last time a doctor reviewed the Asthma Action/Control Plan?

   ☐Within last month ☐Within last 3 months ☐Within last 6 months
   ☐Within last year ☐Within last 3 years ☐It has never been reviewed

   2.2. What was the classification of asthma severity on the Asthma Action/Control Plan?

   ☐Mild intermittent ☐Mild persistent ☐Moderate persistent
   ☐Severe persistent ☐I don't know

3. If a childhood asthma diagnosis, is the child's school nurse aware of the diagnosis?
   ☐No ☐Yes ☐Not a childhood diagnosis

Asthma Symptoms

1. In the **past MONTH**, how often have you/ the child had **DAYTIME** coughing, wheezing, or shortness of breath?	2. In the **past MONTH**, how often have you/ the child had **NIGHTS** coughing, wheezing, or shortness of breath?	3. In the **past MONTH**, how many times have you/ the child needed asthma medications for coughing, wheezing, or shortness of breath?
☐ 2 times a week or less	☐ Once every 2 weeks or less	☐ 2 times a week or less
☐ 3 to 6 times a week, but not everyday	☐ Once a week	☐ 3 to 6 times a week, but not everyday
☐ Every day, but not all the time	☐ More than once a week	☐ 1 time a day
☐ Every day, all the time	☐ Frequently/every night	☐ More than 1 time per day
		☐ Not on medication

4. Does physical activity cause your/ the child's asthma symptoms or cause them to worsen?
☐No ☐Yes

5. How often do your/ the child's symptoms affect the things you do (work, school, activities)?

☐Never ☐2 times a week or less ☐3-6 times per week ☐Daily

6. Do you/ the child have more trouble with asthma during certain times of the year?
☐No ☐Yes
If No, skip to the Burden of Asthma section

6.1. During which month(s) do you/ the child have more trouble with asthma? (Check all that apply)

☐January	☐February	☐March	☐April
☐May	☐June	☐July	☐August
☐September	☐October	☐November	☐December

Burden of Asthma

1. In the **past MONTH**, how many days of work have you missed (or days of school has the child missed) due to asthma?
_____days
If zero, skip to Question 2

1.1. If the child has missed school (in the past month), how many days of work have you or another adult caregiver missed because of the child's asthma?

☐Not a childhood diagnosis _____days

2. In the **past 6 MONTHS**, how many times have you/ the child been **seen in the emergency room or urgent care center** because of asthma?
_____times

3. In the **past 6 MONTHS**, how many times have you/ the child been **admitted to the hospital overnight** because of asthma?
_____times

4. In the **past 6 MONTHS**, how many times have you/ the child been **seen in a doctor's office** because of asthma?
_____times

5. In the **past MONTH**, approximately how much money has been spent on your/ the child's medications related to asthma?

$_____
☐I don't know

6. In the **past MONTH**, approximately how much money has been spent on other medical expenses related to asthma?

$_____
☐I don't know

Asthma Medication

1. Have you/ the child been prescribed any asthma medications? ☐No ☐Yes
If No, skip to the Asthma Control Section

2. During the **past MONTH**, have you/ the child been taking any asthma medications? ☐No ☐Yes

3. If a childhood asthma case, does the child's school nurse have the asthma medication? ☐Not a childhood case ☐No ☐Yes

4. Do you/ the child take medications for asthma even without symptoms? ☐No ☐Yes

5. Do you/ the child take medications for asthma when symptoms occur? ☐No ☐Yes

5.1. For each medication currently being taken, please indicate: ☐No medication

	Prescribed Dose		
Medication Name	# of puffs, mg, ml each time *(Circle puff, mg, or ml).*	# of times/day	# of times/week
	puff - mg - ml		
	puff - mg - ml		
	puff - mg - ml		
	puff - mg - ml		
	puff - mg - ml		

5.2. Are all medications currently being taken as prescribed? ☐No ☐Yes
If Yes, skip to Question 6

5.2.1.1. If no, please describe how the medications are being taken: _____

_____

6. Do you/ the child take any other medications for asthma (including those purchased without a prescription)? ☐No ☐Yes

If No, skip to Question 7

6.1. If yes, please list the medications taken: _____

_____

7. Do you/ the child use a spacer for taking inhaled medications? ☐No ☐Yes

If No, skip to the Asthma Control section

7.1. If yes, in the **past 2 WEEKS**, when inhalers were used, how often did you/ the child use the spacer?

☐Never ☐Less than half the time ☐About half the time
☐More than half the time ☐Most/All the time ☐I don't know

Asthma Control

1. **For self-report only (adults and children over 12 years old):**

If under 12 years old, skip to Question 2

1.1. In the **past MONTH**, how much of the time did your asthma keep you from getting as much done at work, school or at home?

☐All of the time ☐Most of the time ☐Some of the time
☐A little of the time ☐None of the time

1.2 During the **past MONTH**, how often have you had shortness of breath?

☐More than once a day ☐Once a day ☐3 to 6 times a week
☐Once or twice a week ☐Not at all

1.3. During the **past MONTH**, how often did your asthma symptoms (wheezing, coughing, shortness of breath, chest tightness or pain) wake you up at night or earlier than usual in the morning?

☐4 or more nights a week ☐2 or 3 nights a week ☐Once a week
☐Once or twice ☐Not at all

1.4. During the **past MONTH**, how often have you used your rescue inhaler or nebulizer medication (such as Albuterol)?

☐ 3 or more times per day ☐ 1 or 2 times per day ☐ 2 or 3 times per week
☐ Once a week or less ☐ Not at all

1.5. How would you rate your asthma control during the **past MONTH**?

☐ Not controlled at all ☐ Poorly controlled ☐ Somewhat controlled
☐ Well controlled ☐ Completely controlled

2. **For self-report only (children 4 to 11 years old):**
*** If child under 12 has not assented, the Health Assessment is complete**

2.1. How is your asthma today?

☐ Very bad ☐ Bad ☐ Good ☐ Very good

2.2. How much of a problem is your asthma when you run, exercise or play sports?

☐ It's a big problem, I can't do what I want. ☐ It's a problem and I don't like it.
☐ It's a little problem but it's okay. ☐ It's not a problem.

2.3. Do you cough because of your asthma?

☐ Yes, all the time. ☐ Yes, most of the time.
☐ Yes, some of the time. ☐ No, none of the time.

2.4. Do you wake up during the night because of your asthma?

☐ Yes, all the time. ☐ Yes, most of the time.
☐ Yes, some of the time. ☐ No, none of the time.

Injury Supplement

Case #: _____

Personal ID: _____

☐Pre- ☐Post-

For: Children under age 6 and/or Adults over age 65

1. In the **past YEAR**, have you/ the child suffered an injury **in the home** that caused you/ the child to miss work or school, or to seek medical care? ☐No ☐Yes

   1.1. If yes, how were you/ the child hurt?

   ☐Burned ☐Choked ☐Cut/Stabbed
   ☐Poisoned ☐Suffocated ☐Tripped/Fell
   ☐Drowned
   ☐Other: _____
   ☐Other: _____
   ☐Other: _____

   1.2. If yes, in the **past YEAR**, how many of these injuries occurred? _____ injuries

   1.3. Where did the injury occur?

   ☐Front yard ☐Backyard ☐Entryway
   ☐Living room ☐Dining room ☐Kitchen
   ☐Adult's bedroom ☐Child's bedroom ☐Bathroom
   ☐Laundry room ☐Hallway ☐Staircase
   ☐Garage ☐Other _____

Poisoning Prevention

1. Does the home have a working telephone? ☐No ☐Yes
2. Is emergency contact information present in the home? ☐No ☐Yes

   2.1. If yes, does the info. include a number to a poison control center? ☐No ☐Yes

First AID/CPR

1. Are first aid supplies present in the home? ☐No ☐Yes

2. Is anyone in the home trained in CPR? ☐No ☐Yes

3. Is anyone in the home trained in First Aid? ☐No ☐Yes

Fire Prevention

1. Are the smoke detector batteries tested monthly? ☐No ☐Yes

2. Is there a fire extinguisher in the home? ☐No ☐Yes

3. If yes, where is the fire extinguisher located? (Check all that apply)

☐Master bedroom	☐Child's bedroom	☐Kitchen
☐Living room	☐Dining room	☐Hallway
☐Other bedroom	☐Other bedroom	☐Bathroom
☐Other bathroom	☐Other _____	

Child Safety
(OMIT ONLY IF RESPONDENT IS >65 YEARS)

1. If there are baby walkers present in the home, are the wheels removed?

☐Yes, Wheels Removed ☐Yes, Wheels Not Removed ☐No Baby Walker

2. If there is a crib present in the home are the slats >6cm apart?

☐Yes, Slats >6cm ☐Yes, Slats <6cm ☐No Crib

3. Is the stove top located <1 meter from the floor? ☐No ☐Yes

4. At what temperature is the hot water? (MEASURE WITH THERMOMETER)

Kitchen_____ degrees F Bathroom_____ degrees F

Pool Safety

1. If there are children less than 3 years old in the home, do all bathroom doors remain closed at all times?

☐No ☐Yes ☐No children under 3

1.1. If no, are there safety latches on all toilet seats? ☐No ☐Yes

2. Do you ever leave your children alone in the bathtub? ☐No ☐Yes ☐N/A

3. Does the home have a pool or spa? ☐No ☐Yes
If No, skip to Fall Safety

3.1. If yes, what type of pool/spa is present?

☐In-ground ☐Above-ground ☐Inflatable

3.2. Are the pool and/or spa completely surrounded by a property perimeter fence that is at least 5 feet high? (The house may be part of the barrier.) ☐No ☐Yes

3.3. Are the pool and/or spa completely surrounded by a 4-sided fence isolation fence that is at least 4 feet high? ☐No ☐Yes
If No, skip to Question 3.4

3.3.1. If yes, does the fence have a self-latching gate? ☐No ☐Yes
If No, skip to Question 3.4

3.3.1.1 If yes, is the latch out of the reach of children? ☐No ☐Yes

3.3.1.2 Does the gate door self-close? ☐No ☐Yes

3.4. Are any of the following present around the pool/spa:

3.4.1. Working alarms on all doors, pet doors, and windows with direct access to the pool/spa area? ☐No ☐Yes

3.4.2. An automatic power pool cover? ☐No ☐Yes

3.4.3. A laser, light-beam, or infra-red sensor electronic alarm system around pool/spa? ☐No ☐Yes

3.5. Is there pool safety equipment present near the pool/spa? ☐No ☐Yes

3.6. Are there any pool toys or other climbable objects near the fence? ☐No ☐Yes

Fall Safety

1. Is there secure, non-slip treading in the bathtub/shower? ☐No ☐Yes

2. If the home has stairs are safety gates used at the top and bottom?
☐Yes, Safety Gates Used ☐Yes, Safety Gates Not Used ☐No Stairs

3. Do the steps in the stairway have consistent height? ☐No ☐Yes

MEASURE STAIRS

STAIRWAY 1: RISE_____in RUN_____in #of steps_____

STAIRWAY 2: RISE_____in RUN_____in #of steps_____

Firearms----------

4. Is there a firearm in the home? ☐No ☐Yes

5. Number of firearms in the home? #_____

6. Are firearms kept separate from ammunition? ☐Yes-All ☐Yes- Some ☐No

7. Are firearms in a locked box or cabinet? ☐Yes-All ☐Yes- Some ☐No

8. If yes, where is the fire extinguisher located? (Check all that apply)

☐Master bedroom	☐Child's bedroom	☐Kitchen
☐Living room	☐Dining room	☐Hallway
☐Other bedroom	☐Other bedroom	☐Bathroom
☐Other bathroom	☐Other _____	

APPENDIX 4

Visual Assessment

The following questionnaire was created by Mackenzie Burns, Erika Marquez, and Sabrina La Monica under the direction of Dr. Shawn Gerstenberger at the University of Nevada Las Vegas, Department of Environmental and Occupational Health, 4505 Maryland Parkway, Box 45063, Las Vegas, Nevada, 89154. Input from community partners in the areas of health and housing was vital to the development of this questionnaire.

This questionnaire will be administered to the primary resident of the home and has been approved by the UNLV Office for the Protection of Research Subjects prior to use.

For additional information regarding this protocol, please call 702-895-5420.

If you use materials from this questionnaire, please let us know by sending an email to shawn.gerstenberger@unlv.edu.

Thank you!

Visual Assessment Checklist - Page 1

Date of Assessment: _____ **Pre -** ☐ **Post -** ☐ **Case Number:** _____ **Name of Assessor:** _____

	Observation		Frontyard	Entryway	Backyard	Living Room	Dining Room	Kitchen	Bedroom 1	Bedroom 2	Bedroom 3	Bathroom 1	Bathroom 2	Hallway	Staircase	Laundry	Garage			Notes
Indoor Air Quality	Unvented gas appliance/broken vent																			
	Mold or Mildew	Obvious source of moisture																		
		No obvious source of moisture																		
	Bathroom fans operable or openable window																			
	Evidence of tobacco smoke or other usage																			
	Evidence of unusual odors																			
Pb Prevention	Bare soil (without grass, mulch, rocks, etc.)																			
	Deteriorated Paint	Walls																		
		Windows, doors, or trim																		
		Visible chips on ground																		
Detectors	Smoke detector (1=Works, 0=Not works, ?=DK)																			
	CO detector(1=Works, 0=Not works, ?=DK)																			
	Cleanliness (C=Clean, S=Some Clean, N=Not Clean)																			
	Clutter (L=Low, M=Medium, H=High)																			
Structural Elements of the Home	Broken/inoperable light fixtures																			
	Broken/missing/code violations of components																			
	Plumbing problem																			
	Water damage (wet walls, stains, etc.)																			
	Broken windows																			
	Improperly screened windows																			
	Cracks in the walls (larger than width of dime)																			
	Roof damage (sagging, leaking, missing materials)																			
Pests	Improperly stored foods or pet foods																			
	Improperly stored garbage																			
	Evidence of pests (C=Cockroaches, R=Rodents, B=Bed bugs, M=Multi)																			

Visual Assessment Checklist - Page 2

	Observation	FrontYard	Entryway	Backyard	Lr/Inc Room	Dining Room	Kitchen	Bedroom 1	Bedroom 2	Bedroom 3	Bathroom 1	Bathroom 2	Hallway	Staircase	Laundry	Garage			Notes
Injury Prevention (Homes with children <6 or adults >65 years old)	Accesible sharp objects < 1m (COUNT)																		
	Sharp edges on furniture cabinets <1m																		
	Glass surfaces on furniture / cabinets <1 m																		
	Improperly stored chemicals < 1m (COUNT)																		
	Unsecured tipping hazard < 1m (COUNT)																		
	Identified trip or fall hazards (COUNT)																		
	Unsecured second story windows (unlocked, no guard)																		
	Dangerous cords other strangulation hazard <1m																		
	Choking hazards (ping pong ball or smaller) <1m																		
	Uncovered outlets, powercords misused <1m (COUNT																		
	Fire Hazards <1m (matches, lighters, candles, incense)																		
	Hot water above 120°F (without scald guards)																		
	Unsecured pool/spa																		
	Other unsecured drowning hazard (buckets, toilets)																		
	Unsafe outdoor playground equipment																		
Other Observations																			
Readings	Air Temperature			Floor 1 (Living Room):									Floor 2 (Hallway):						
	Relative Humidity			Floor 1 (Living Room):									Floor 2 (Hallway):						

APPENDIX 5

IRB Proposal and Protocol

The following proposal was written by Erika Marquez and Sabrina La Monica under the direction of Dr. Shawn Gerstenberger at the University of Nevada Las Vegas, Department of Environmental and Occupational Health, 4505 Maryland Parkway, Box 45063, Las Vegas, Nevada, 89154.

For additional information regarding this protocol, please call 702-895-5420.

If you use materials from this protocol please let us know by sending an email to shawn.gerstenberger@unlv.edu.

Thank you!

UNLV
UNIVERSITY OF NEVADA LAS VEGAS
Office of Research
Integrity
Human Subjects

IRB Received Date Stamp—Office Use Only	IRB Protocol Number—Office Use Only 1008-3565

Research Protocol Proposal Form
for Research Involving Human Subjects

1. Duration and Title

1.1 Duration of Study
Anticipated Start Date: 10/01/10 Anticipated Termination Date: 10/31/15

1.2 Research Protocol Title
(Research Protocol Title must match the funding/proposed funding application or proposal)

PI Initiated Modification

2. Investigator's Contact Information
(The PI must be UNLV faculty in all cases involving studies carried out by students or fellows.)

Name and Credentials:
Dr. Shawn Gerstenberger PhD

Department/ Institution: Enviornmental and Occupational Health Mail Stop: 453064 Main Phone: 702-895-1565 Ext:

Email: shawn.gerstenberger@unlv.edu

Role in Protocol: * Primary Investigator - development of protocol

Role in Consent process: * Consenting subjects and addressing questions and concerns

Specific Experience with Role in Protocol: * Over 11 years of research in subject area

3. Student/Fellow Investigator

3.1 Is there a Student Researcher who is conducting this research as a basis for their dissertation or thesis?

- (•) Yes
- ( ) No

Name and Credentials:
Miss Mackenzie Burns MPH

( ) > Undergraduate ( ) > Master ( ) > Doctorate ( ) > Fellow

Department/ Institution: Environmental & Occupational Health/UNLV Mail Stop: Main Phone: 925-683-5784 Ext:

Email: kenziesb@aol.com

Role in Protocol: *

Role in Consent process: *

Specific Experience with Role in Protocol: *

4. Protocol Coordinator

Name and Contact Information for Correspondence
Name and Credentials:
Ms. Erika Torres MPH

Department/ Institution: Environmental & Occupational Health/UNLV Mail Stop: Main Phone: 702-895-5449 Ext:

Email: erika.torres@unlv.edu

Role in Protocol: * Collecting and managing data

Role in Consent process: * Recruiting subjects, writing consent forms, consenting subjects, answering questions
Specific Experience with Role in Protocol: * Has several years of experience in public health and is a certified lead assessor and healthy homes trainer.

5. Co- Principal Investigators
Name and Credentials:
Mrs. Michelle Chino PhD

○ Faculty ○ Staff ○ Not Affiliated

Department/ Institution: Environmental & Occupational Health/UNLV Mail Stop: Main Phone: 702-895-2649 Ext:

Email: michelle.chino@unlv.edu

Role in Protocol: * Developed protocol

Role in Consent process: * Recruiting subjects, consenting subjects, answering questions

Specific Experience with Role in Protocol: * Has 20+ years of research experience. Expert in the field of injury prevention. Experienced with working with under-served and minority populations.
Name and Credentials:
Mrs. Sheniz Moonie PhD

● Faculty ○ Staff ○ Not Affiliated

Department/ Institution: Environmental & Occupational Health/UNLV Mail Stop: Main Phone:

702-895-5843 Ext:

Email: sheniz.moonie@unlv.edu

Role in Protocol:* Developed protocol

Role in Consent process:* Recruiting subjects, consenting subjects, answering questions

Specific Experience with Role in Protocol:* Epidemiologist and biostatistician with 8 years experience with data management with an emphasis on asthma clinical trials data

6. Research Team Members:

Name and Credentials:
Mrs. Sabrina Bartholomew (La Monica) BA

Department/ Institution: Environmental & Occupational Health/UNLV Mail Stop: Main Phone: 801-884-6089 Ext:

Email: sabrina.bartholomew@gmail.com

Role in Protocol:* Collecting data

Role in Consent process:* Recruiting subjects, consenting subjects, answering questions

Specific Experience with Role in Protocol:* Currently working on an MPH at UNLV. Has a Bachelor's degree in Psychology and in Public Health, with research experience in the area of mental health. Has 2+ years experience with home visits, and completed the Healthy Homes Training.

Name and Credentials:
Ms. Jennifer Berger MPH

Department/ Institution: Environmental & Occupational Health/UNLV Mail Stop: Main Phone: 702-521-5638 Ext:

Email: bergerj2@unlv.nevada.edu

Role in Protocol:* Collecting data

Role in Consent process:* Recruiting subjects, consenting subjects, answering questions

Specific Experience with Role in Protocol:* Currently working on her PhD at UNLV. Jennifer is a certified Healthy Homes Specialist and has worked as a Clinical Laboratory Scientist for over 3 years.

Name and Credentials:
Miss Michelle Chung

Department/ Institution: DEOH Mail Stop: Main Phone: 702-521-5638 Ext:

Email: chungm2@unlv.nevada.edu

Role in Protocol:* Collecting data

Role in Consent process:* Recruiting subjects, consenting subjects, answering questions

Specific Experience with Role in Protocol: * Michelle is a certified Healthy Homes Specialist.

7. Complete Description of the Study Procedures

A. Purpose and Methods

7.1 Describe the purpose of the study:

The Childhood Lead Poisoning Prevention Program (CLPPP) of the Southern Nevada Health District (SNHD) has worked with the Department of Environmental and Occupational Health (DEOH) at the University of Nevada Las Vegas (UNLV) over the past several years. Although progress was made in the surveillance and prevention of childhood lead poisoning due to collaborative efforts of SNHD and UNLV. CLPPP activities raised and identified additional health and housing concerns for the residents of Southern Nevada. As CLPPP members responded to lead poisoning cases and initiated primary prevention activities it became evident that lead poisoning was not the only housing-related health risk common among older, low-income, housing. In response CLPPP & DEOH conducted 88 housing inspections (in %u201Ctarget zip codes selected for this project) to assess the level of housing remediation needed in Clark County. Over 50 percent of houses included in the sample needed some type of interior and/or exterior remediation. In 2009, the Surgeon General published the nations %u201CCall to Action%u201D (CTA) a guideline to promote Healthy Homes across the United States. The document describes how people play integral part of preventing disease, disability and injury that may result from health hazards in their home. The CTA also serves as a guiding document for public health professionals to develop a comprehensive and coordinated approach to address home hazards that adversely affect health. The Surgeon General%u2019s nationwide agenda has been adopted by many federal, state and local agencies. In line with the CTA, the Centers for Disease Control and Prevention (CDC) Childhood Lead Poisoning Prevention Branch has begun its shift into a Healthy Homes initiative by providing Healthy Homes funding to qualified candidates. Preliminary data collected through CLPPP activities, coupled with a CDC funded - Building Strategic Alliance grant, allowed the DEOH to begin the process of evaluating and developing a healthy homes initiative for Clark County. A collaborative network of partners is now well established and functions as The Nevada Healthy Homes Partnership. The Nevada Healthy Homes Partnership is anchored in a county-wide consortium of public and private housing authorities and health agencies concerned with addressing multiple health and housing-related hazards that exist among primarily low income residents in Clark County, Nevada. The DEOH and collaborating partners such as SNHD and the non-profit housing organization Rebuilding Together (RBT), will work together to create a holistic approach to address health and housing concerns. The coalition is focused on creating an effective and sustainable program to identify, assess, and remediate multiple health and housing-related hazards; and to connect residents to community resources in an organized, consistent and systematic manner. The proposed project will serve Clark County, located in the southernmost section of Nevada, with initial demonstration activities to be conducted in nine target zip codes (see inclusion criteria for further detail) in older, low income, and high risk communities in the cities of Las Vegas and North Las Vegas. These communities were selected based on lower socioeconomic status, elevated asthma rates, and older housing. The majority of the target areas contain high risk groups, such as, Hispanics and families with young children. The DEOH will establish an integrated system of identification, assessment, educational intervention, community resource connection, and remediation of health and

housing-related hazards. The DEOH will focus on assessing health conditions, such as, unintentional injury, poisoning, and asthma control, as data indicates sufficient need in the community. Three overarching hypotheses guide project activities: Hypothesis 1. Objective: Improve asthma health in children through educational and environmental modifications. Hypothesis: The number of doctor visits, asthma attacks, days of missed school and work (by care takers) will be reduced following educational and environmental modification. Independent Variable: Educational and Environmental Modifications Dependent Variable: Asthma Health Measured by: Asthma Health is measured by the pre and post Asthma Supplement forms, using asthma burden and control measures, such as, the number of doctor visits, number of visits to the ER, numbers of hospital admissions, number of attacks, number of missed school days, and number of missed work days. Hypothesis 2 Objective: Reduce unintentional injury and poisoning hazards in the home through educational and environmental modifications. Specific hazards will be evaluated for children 6 and under and adults 65 and older. Hypothesis: Using a pre and post evaluation/intervention model, the number of hazards, present in the home will be significantly reduced following educational and/or environmental interventions. Independent Variable: Educational and Environmental Modifications Dependent Variable: Number of Unintentional Injury and Poisoning Hazards Measured by: The number of unintentional injury and poisoning hazards present in the home will be assessed pre and post using the Resident Questionnaire, the Visual Assessment checklist and Injury Supplement. Hypothesis 3. Increase the tenants knowledge, attitudes and beliefs regarding the Eight Principles of Healthy Homes. Hypothesis: The homeowners/renters awareness of conditions in the home that directly impact health will increase following educational intervention. Independent Variable: Educational Intervention Dependent Variable: Knowledge, attitudes and beliefs regarding the Eight Principles of Healthy Homes Measured by: Using a pre and post evaluation model an educational assessment tool will be completed to measure changes in knowledge, attitudes and beliefs about home hazards and the Eight Principles of Healthy Homes. Numerous health conditions are caused or exacerbated by exposures or conditions in the home environment. Allergies, asthma, unintentional injuries and poisoning are among health problems connected to the design and condition of housing as well as resident exposure to hazards such as cigarette smoke. By first assessing housing hazards and health conditions in low-income homes in Clark County, and then providing residents with educational materials and resources for remediation, the DEOH aims to improve health outcomes and quality of life among individuals and families living in Southern Nevada.

7.2 Provide a **COMPLETE** description of the study procedures in the sequence that they will occur. The process from recruitment, intake, intervention implementation to closure of the file is detailed below: 1. Recruitment and Referral: Participants will be recruited through referrals that will be obtained by community partners (i.e., Rebuilding Together, University of Nevada School of Medicine) and through Healthy Homes outreach activities. Once a referral form is received by DEOH, the Healthy Homes project manager Erika Marquez, with assistance from DEOH graduate students (Mackenzie Burns, Jennifer Berger, Michelle Chung and Sabrina Bartholomew [La Monica]), will contact the individual on the referral form. Contact will be obtained by telephone to provide the individual with basic information about Healthy Homes and to determine if the referred individual is interested in receiving a Healthy Homes Assessment and meets qualification criteria. If the referred individual cannot be reached or is no longer interested, the case will be closed. Participants must be a resident of Clark County, must own their home, must be below 80% of median income as per the

Department of Housing and Urban Development federal guidelines, and meet at least one of the following criteria: a family member residing in the home must be over the age of 65, under the age of 6, or under the age of 18 with diagnosed asthma or suspected asthma. If the family does not meet the criteria stated above, but lives in pre-1978 within Clark County, they may receive a free lead-risk assessment to identify lead-based housing hazards. If the referred individual is interested in participating during the initial phone contact and meets eligibility criteria then a site visit will be scheduled. Eligible referrals will receive a Healthy Homes and Lead Risk Assessment and a targeted educational plan specific to the home hazards and health conditions identified by research team members. Once the site visit is scheduled, two or more team members (including at least one member who is a certified Healthy Homes Specialist, as credited by the National Environmental Health Association (NEHA), and certified Lead Risk Assessor, as credited by the Environmental Protection Agency) will go to the home to perform the Healthy Homes and Lead Risk Assessment. 2. Initial Visit - Consent Process & Completion of Questionnaires: At the time of the first home visit, informed consent and liability waivers will be completed by the primary resident (i.e., owner of the home, renter on the lease, or one adult member of the head of household). Legal waivers protect DEOH team members from any liability issues that may arise due to damage or injury that may occur while onsite. After the consent process is complete and the primary resident has agreed to participate, the primary resident will complete a series of questionnaires, including, the Education Pre-test, the Resident Questionnaire and the Health Questionnaire, the Lead Assessment Questionnaire (as well as Asthma, Suspected Asthma (has asthma symptoms, but not diagnosed) and Child Safety Supplements, as needed). The Education Pre-test will include questions to measure residents' attitudes, knowledge and beliefs about housing based hazards. In addition, the primary resident will complete a Resident and Health Questionnaire. Questionnaires collect information, such as, demographic data, number of household members and information on focal research areas (i.e., housing conditions, asthma, unintentional injury, and poisoning). The primary resident will complete the forms; however, DEOH research team members will provide assistance to those unable to read the forms on their own, as needed. The only data on these forms that are not self-reported include public data, such as, the dwellings year of construction and square footage. To properly allocate resources it is necessary to verify the year of construction of home, particularly, when identifying lead-hazards in dwellings built prior to 1978. The informed consent, liability waiver release, Educational Pretest, Resident Questionnaire, Health Questionnaire and Lead Assessment Questionnaire are attached for review. If there are other adult members of the household wish to participate they must be over the age of 65 and will need to sign the Consent Form. Those members will complete the Health Questionnaire, the Asthma Supplement and the Suspected Asthma Supplement as needed. If there are children under the age of 6 or children under 18 with an asthma diagnosis or suspected to have asthma the parent or legal guardian will complete the Health Questionnaire, Asthma Supplement, Suspected Asthma Supplement and/or the Child Safety Supplement for the child. The Child Safety Supplement is completed in homes that have children under the age of 6. Only one is completed per household. The Health Questionnaire, the Asthma Supplement and the Suspected Asthma Supplement is completed for each child under the age of 18. Additional participants will not complete a Resident Questionnaire (as this data is only necessary and acquired from the primary resident). 2. Initial Visit %u2013 DEOH Visual Assessment: At the first home visit, at least two research team members will conduct a Healthy Homes and Lead Risk Assessment on the home. DEOH will compete a Visual Assessment Checklist which is a room by room inspection in which DEOH research team members will check moisture levels of the home and

will identify other housing-based hazards that effect one or more of our focal areas (i.e., asthma, injury). In addition to the visual assessment, an abbreviated lead risk assessment will be accomplished through the use of data retrieved from an X-Ray Fluorescence (XRF) machine, used to determine lead concentration levels in paint and hard surfaces. Paint sampling forms will be used to record data collected from the XRF. If needed dust, soil, water and miscellaneous sampling forms will be used to record any additional samples taken. All forms associated with the visual assessment portion of this study are attached for review. DEOH research team members will review hazards found in the home with the resident (a walkthrough of the home is conducted). The resident will be notified of any hazards that need to be addressed immediately. 3. Follow-Up Visit - Intervention: After the initial home visit, intervention levels will be determined based on the number and severity of hazards identified during visit one. One of three intervention levels is possible for each home (basic, facilitated and intensive). The first two levels of intervention are provided directly by the DEOH research team. The basic intervention model will include an in-home tailored educational session. During the educational session the resident will be given the Nevada Healthy Homes Partnership educational booklet which will review asthma/asthma triggers and the Eight Principles of Healthy Homes, as established by the National Center for Healthy Housing. These eight core principles include: Keep it Dry, Keep it Clean, Keep it Pest-Free, Keep it Safe, Keep it Contaminant-Free, Keep the Air in Your Home Fresh, Keep it Maintained, and Keep it Green. The booklet will be provided at no-cost to the resident and will supply families with low-cost methods to maintain their home, reduce asthma triggers, and injury hazards. The facilitated level of intervention will include the tailored educational session (as described above) and will also provide device intervention (i.e., carbon monoxide detectors, mops, and buckets). These devices will be provided and installed by research team members directly. The intensive level of intervention will be the most comprehensive intervention level. In addition, to what is provided in the basic and facilitated model the intensive intervention will include rehabilitation services provided by community partners, such as, Rebuilding Together (RBT) and their contractors. As a leading community partner with DEOH, RBT will work with Healthy Homes participants to provide remediation services for some or all of the hazards identified during the Healthy Homes and Lead Risk Assessment. Only information necessary for remediation will be shared with RBT. It is important to emphasize RBT's role in financing and managing the remediation component of the program. Participants must meet qualification criteria as established by community partners. All prequalification information and documentation will be handled by RBT, according to procedures already established, and pursuant to their available funding. Implementation of basic and facilitated level of intervention will be conducted within 2-5 weeks after the initial home visit. However, DEOH will make attempts to accommodate emergency referrals and homes that need a shorter turn around period for intervention; such exceptions will be handled on a case-by-case basis. Remediation activities will be completed by RBT and their contractors, according to RBT policies. Each case will be carefully considered and matched to the appropriate priority and intervention level, based on information from the Visual Assessment and input from community partners. The DEOH will complete an intervention form (see attached) indicating the determined intervention and priority level for each case. The intervention form will identify any devices needed and/or provided and will include any scheduled remediation. A document outlining criteria for levels of intervention and priority is also attached for review. Any Healthy Homes issues identified outside the scope of this project will be referred to community partners. Forwarding this information may be necessary to provide further assistance to the residents and will be necessary to arrange any remediation services through organizations, such as,

Rebuilding Together (RBT). 4. Post-Evaluation: DEOH research team members will return to the home for post evaluation approximately 6-12 months after initial home visit. At this time consented individuals will complete a Post-Education Questionnaire, a Post-Health Assessment, a Resident Questionnaire, and a Program Evaluation (Child Safety Supplement, Asthma & Suspected Asthma Supplement as needed). A pre/post evaluation model will be implemented to assess changes in the physical home environment (via the Visual Assessment tool), changes in health conditions, and changes in attitudes, knowledge and beliefs about housing conditions that effect health. At the end of the study, after the resident has completed all pre and post assessments and home visits, the primary resident of the home will receive a $50 gift card to Walmart for the purchase of home maintenance and cleaning supplies. These $50 dollar gift cards to Walmart have already been purchased and will be provided by the Southern Nevada Health District (SNHD) as an incentive mechanism for study participation. 6. Close Out: Once all questionnaires and follow up visits are complete, the case is finished and a member of the DEOH research team will close out the file. At this point, data will be entered into SPSS for analysis. All information for each case will be stored in secured databases and locked file cabinets. The project provides a holistic approach to address multiple hazards in the home. The task set forth by the CDC is to build strategic partnerships to improve the quality of housing and health among residents. As a result of the collaborative nature of this project certain activities would occur outside IRB approval, such as, outreach initiatives and remediation. However, data collected during pre/post housing, health and knowledge assessments and data collected through educational and device interventions encompass the research and evaluation components of this project.

B. Consent

7.3 Describe the consent process for enrolling subjects into this study.
The research team members comprised of UNLV associates - Dr. Gerstenberger, Dr. Moonie, Dr. Chino and UNLV graduate students Erika Marquez, Mackenzie Burns, Michelle Ching, Jennifer Berger, and Sabrina Bartholomew (La Monica) which are HIPAA certified and have completed IRB training certification (see attached). UNLV graduate students will sit down with each potential participant and provide them with consent forms. The participating head of the household and other adults providing health information will be consented. Potential participants will be given enough time to decide on whether or not they would like to participate in the study. The research team members, will answer any questions the potential participant may have. If interested, all consent and legal forms will be read and signed.

7.4 Where will the consenting process take place?
The consenting process will take place at the resident's home.

7.5 Is a Waiver of Documentation of Informed Consent being requested?
○ Yes ◉ No

8. Research Activities (Part A - Exempt)

(Check the applicable categories):

☐ 1) Research conducted in established or commonly accepted educational settings, involving normal educational practices, such as

(i) research on regular and special education instructional strategies, or
(ii) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.

☐ 2) Research involving the use of educational tests *(cognitive, diagnostic, aptitude, achievement)*, survey procedures, interview procedure or observation of public behavior, unless:

(i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and
(ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

☐ 3) Research involving the use of educational tests *(cognitive, diagnostic, aptitude, achievement)*, survey procedures, interview procedures, or observation of public behavior that is not exempt under paragraph (b)(2) of this section, if:

(i) the human subjects are elected or appointed public officials or candidates for public office; or
(ii)Federal statute(s) require(s) without exception that the confidentiality of the personally identifiable information will be maintained throughout the research and thereafter.

☐ 4) Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

☑ 5) Research and demonstration projects which are conducted by or subject to the approval of Department or Agency heads, and which are designed to study, evaluate, or otherwise examine:

(i) Public benefit or services programs;
(ii) procedures for obtaining benefits or services under those programs;
(iii) possible changes in or alternatives to those programs or procedures; or
(iv) possible changes in methods or levels of payment for benefits or services under those programs.

☐ 6) Taste and food quality evaluation and consumer acceptance studies,

(i) if wholesome foods without additives are consumed or
(ii) if a food is consumed that contains food ingredient at or below the level and for a use found to be safe, or agricultural chemical or environmental contaminant at or below the level found to be safe, by the Food and Drug Administration or approved by the Environmental Protection Agency or the Food Safety and Inspection Service of the U.S. Department of Agriculture.

☐ None of the above categories apply to the proposed research study.

9. Research Activities (Part B)

Please check any/all that apply to the proposed research study.

☐ (1) Clinical studies of drugs and medical devices only when condition (a) or (b) is met.

(a) Research on drugs for which an investigational new drug application *(21 CFR Part 312)* is not required. *(Note: Research on marketed drugs that significantly increases the risks or decreases the acceptability of the risksassociated with the use of the product is not eligible for expedited review.)*
(b) Research on medical devices for which (i)an investigational device exemption application *(21 CFR Part 812)* is

not required; or (ii) the medical device is cleared/approved for marketing and the medical device is being used in accordance with its cleared/approved labeling.

☐ (2) Collection of blood samples by finger stick, heel stick, ear stick, or venipuncture as follows:

(a) from healthy, non-pregnant adults who weigh at least 110 pounds. For these subjects, the amounts drawn may not exceed 550 ml in an 8 week period and collection may not occur more frequently than 2 times per week; or
(b) from other adults and children, considering the age, weight, and health of the subjects, the collection procedure, the amount of blood to be collected, and the frequency with which it will be collected. For these subjects, the amount drawn may not exceed the lesser of 50 ml or 3 ml per kg in an 8 week period and collection may not occur more frequently than 2 times per week.

☐ (3) Prospective collection of biological specimens for research purposes by noninvasive means.

Examples: hair and nail clippings in a non-disfiguring manner; excreta and external secretions (including sweat); uncannulated saliva collected either in an unstimulated fashion or stimulated by chewing gumbase or wax or by applying a dilute citric solution to the tongue; placenta removed at delivery; supra- and subgingival dental plaque and calculus, provided the collection procedure is not more invasive than routine prophylactic scaling of the teeth and the process is accomplished in accordance with accepted prophylactic techniques; mucosal and skin cells collected by buccal scraping or swab, skin swab, or mouth washings; sputum collected after saline mist nebulization.

☐ (4) Collection of data through noninvasive procedures ***(not involving general anesthesia or sedation)*** routinely employed in clinical practice, excluding procedures involving x-rays or microwaves. Where medical devices are employed, they must be cleared/approved for marketing.

Examples: physical sensors that are applied either to the surface of the body or at a distance and do not involve input of significant amounts of energy into the subject or an invasion of the subject's privacy; weighing or testing sensory acuity; magnetic resonance imaging; electrocardiography, electroencephalography, ultrasound, diagnostic infrared imaging, doppler blood flow, and echocardiography; moderate exercise, muscular strength testing, body composition assessment, and flexibility testing where appropriate given the age, weight, and health of the individual.

☐ (5) Research involving materials ***(data, documents, records, or specimens)*** that have been collected, or will be collected solely for nonresearch purposes ***(such as medical treatment or diagnosis)***.

(NOTE: Some research in this category may be exempt from the HHS regulations for the protection of human subjects. 45 CFR46.101(b)(4). This listing refers only to research that is not exempt.)

☐ (6) Collection of data from voice, video, digital, or image recordings made for research purposes.

☑ (7) Research on individual or group characteristics or behavior ***(including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior)*** or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

(NOTE: Some research in this category may be exempt from the HHS regulations for the protection of human subjects. 45 CFR 46.101(b)(2) and (b)(3). This listing refers only to research that is not exempt.)

☐ None of the above categories apply to the proposed research study.

10. Research Activities (Part C)

Please check any/all that apply to the proposed research study.

☐ False or misleading information will be presented to subjects (deceptive studies).

☐ Procedures for debriefing subjects: ***(Debriefing is defined as giving subjects previously undisclosed information about the research project following completion of their participation in research. Note that this usage, which occurs within the behavioral sciences, departs from standard English, in which debriefing is obtaining rather than imparting information.)***.

☐ Invasive biomedical procedures

☑ Sensitive questions will be asked about personal issues.

☐ The study involves use of potentially hazardous materials.

☐ The research includes collection/storage of data/biological specimens for future research analysis. *If yes, the consent document must address the possibility of future use.*

☐ Procedures are novel or not accepted practice ***(if this category applies, explain in the Informed Consent Form how provisions are made to correct, treat or manage unexpected adverse effects).***

☑ Risky procedures or harmful effects, including discomfort, risk of injury, invasive procedures, vulnerability to harassment, invasion of privacy, controversial information or information creating legal vulnerability ***(if this category applies, explain in the Informed Consent Forms how harmful effects will be addressed and how benefits outweigh risks).***

☐ None of the above categories apply to the proposed research study.

11. Project Site(s)

(Check all that apply)

☑ University of Nevada, Las Vegas (UNLV)

Please check the specific campus: ☑ Maryland Campus ***(main)*** ☐ Shadow Lane Campus

☐ Online only

☑ Other ***(Specify and Explain)***: Homes of residents/participants

NOTE: If the project site is other than UNLV or online, Facility Authorization Letter must be submitted.

12. Research Subjects

12.1 Maximum number of subjects: 500

12.2 Describe the targeted population ***(e.g. healthy adults age 18-45)***, including age range:
Our target population includes Nevada residents specifically residing in the following zip codes: 89106, 89030, 89110, 89109, 89121, 89119, 89101, 89104, and 89107. These zip codes were originally chosen as target areas for the Childhood Lead Poisoning Prevention Program (CLPPP). These zip codes have the highest prevalence of asthma, lowest housing quality, the highest number of homes built prior to 1978 and are neighborhoods of lower socioeconomic status. We plan to serve others outside of these zip codes as well, but will focus our efforts primarily on homes in these areas.

12.3 Summarize the inclusion and exclusion criteria that must be met in order for the person to participate in the study.

12.3.1 Inclusion:
In order to participate in the study participants must be a resident of Clark County, must own their own home, must be below 80% of median income as per the Department of Housing and Urban Development federal guidelines, and must at least one of the criteria below: Have a family member that resides in the home and is under the age of 6, or is under the age of 18 with diagnosed asthma or suspected to have asthma, or is over the age of 65 However, if the home-owner lives in a home built prior to 1978 they may receive a lead-risk assessment to identify lead-hazards.

12.3.2 Exclusion, *if any*:
Our high-risk variables include pre-1978 housing, children under 6, and children under 18 with asthma /suspected asthma, and elderly over 65. Therefore, households who do not meet these criteria will be excluded. In order to receive home remediation, residents must meet financial criteria and qualification of RBT.

12.4 Are there any enrollment restrictions based on gender, pregnancy, race or ethnic origins? ○ Yes ● No

13. Privacy and Confidentiality

13.1 How will you protect the privacy of the participants?
To protect the privacy of participants the research team member will speak one on one with individuals. The information provided to UNLV will not be discussed with anyone else in the home and will be discussed sensitively and carefully only for the purpose of helping the individual to receive services provided by the Nevada Healthy Homes Partnership.

13.2 How will you ensure confidentiality of the data obtained?
Protection of participants' identity will be very important and will be protected to the extent of the law. All team members of this research project are CITI trained. Once the assessment information is obtained, Erika Torres the project manager at UNLV will keep these data in a locked cabinet in the Bigelow Health Sciences building (BHS) located at 4505 S. Maryland Parkway, Las Vegas, NV 89154. This information will be entered into a password protected computer and data files will be securely locked. For all electronic data, each participant will be assigned a unique identifier to protect confidentiality. No personal information will be used in any reports or publications that may result from this study. This information will be kept as long as is required by law.

13.3 Where will all data be stored? ***(For review/audit purposes, records must be stored on UNLV property.)***
Check all that apply:

- ☐ PI's office - *(bldg/room)*.
- ☐ PI's Lab - *(bldg/room)*.
- ☑ Other - *(bldg/room)*: BHS 339

13.4 How long will all data be stored?
The data will be stored for five years or until publication.

13.5 What are the plans for the final disposition or destruction of all data?

After the storage period is over all data will be shredded.

14. Recruitment Procedures

14.1 Describe below the processes used for selecting subjects and the methods of recruitment, including use of letters and/or advertising. Include, when, how and by whom the subjects will be recruited.

The primary method of recruitment will be accomplished with the assistance of RBT, who will recruit and refer new and existing clients to the Healthy Homes program. Additionally, the Nevada Healthy Homes Partnership will conduct outreach at community events in Clark County as specified within our grant application. Outreach materials including poster contest and informational flyers are attached.

14.2 Indicate the types of recruitment materials to be used below *(check all that apply)*. Attach copies of all recruitment materials to this application through the Supporting Documents Grid on the Home Page of CyberIRB.

- ☑ Internet/Email
- ☑ Television/Radio/Newspaper
- ☑ Flyers/Posters/Brochures
- ☑ Letter of Contact
- ☐ Subject Pool Description
- ☑ Other *(Describe)*: eferrals from partners from housing and health age
- ☐ This research study will not be using any recruitment materials.

14.3 Do you or any member of the research team have an authoritative role over the research subjects?

○ Yes ◉ No

15. Medical Device Form

A Medical Device is "an instrument, apparatus, implement, machine, contrivance, implant, in vitro reagent, or other similar or related article, including a component part, or accessory which is: recognized in the official National Formulary, or the United States Pharmacopoeia, or any supplement to them; intended for use in the diagnosis of disease or other conditions, or in the cure, mitigation, treatment, or prevention of disease, in man or other animals; or intended to affect the structure or any function of the body of man or other animals, and which does not achieve any of its primary intended purposes through chemical action within or on the body of man or other animals and which is not dependent upon being metabolized for the achievement of any of its primary intended purposes."

15. Are you using a medical device? ○ Yes ◉ No

16. Risks and Benefits

A. Risks

16.1 Summarize the nature and amount of risk *(including side effects, stress, and discomfort)*. Examples of risk include physical risks, psychological risks *(such as stress, discomfort, or invasion of privacy)* and social risks *(such as jeopardy to insurability or employability)*.

Some risk is involved in this study though the amount is minimal. Although people are choosing to let

us enter their homes to perform risk assessments and provide educational materials, there may be some feelings of stress, embarassment, and discomfort associated with the visit. The Healthy Homes Assessment Tools ask questions about about health conditions and the home environment, some of which may be considered personal in nature. Some of these questions may cause participants to feel uncomfortable or uneasy. No physical risk is associated with this study.

16.2 Estimate the probability *(e.g. not likely, likely, etc.)* that a given harm may/will occur, its severity, and its potential reversibility.
The probability that harm will occur in this study is very low. The likelihood of risks is minimal since this study is about making the home environment safe and healthy. Much of the study involves simple observation and collecting information from questionnaires. The interventions provided to participants through this study may relieve feelings of stress, embarassment, or discomfort associated with the results of the assessments.

16.3 What procedure(s) will be utilized to prevent/minimize any potential risks?
To keep any negative feelings that may be associated with home visits minimal, Healthy Homes risk assessors will carefully explain procedures in a non-intrusive, non-judgmental manner. Healthy Homes team members will emphasize their desire to help and will express thanks and appreciation to the resident for wanting to participate. In the case of asking questions that could be considered personal in nature as part of the assessment tools, Healthy Homes team members will emphasize that participation in the study is voluntary and participants can withdraw at any time. Researchers will remind participants that no personal information from clients will be shared outside of the scope of Healthy Homes. UNLV researchers will not engage in coercive activities to prevent and minimize any potential risk.

B. Benefits

16.4 Describe any probable benefits of the research for the subject(s). *(Do not address compensation)*
Those who choose to participate in Healthy Homes and receive a free home assessment will benefit in numerous ways. At minimum, each participant will receive educational tools to help create a healthy home and prevent harm and injury from occuring in the home. Many participants will receive tools to help create a healthy home and protect the health of their family such as outlet covers or buckets and mops. Lastly, individuals may qualify for remediation, meaning they will have the opportunity to have something installed, repaired, or completely renovated in their home. The remediation component of the project will be financed and managed by community partner Rebuilding Together. Evidence shows that improving the home environment can positively impact the quality of life, health, and wellness of each resident. People will be provided with the tools (education and resources, devices, and/or remediation) to make their home environment more conducive to healthy outcomes and will have the peace of mind of knowing they are doing what they can to keep their home and family safe.

16.5 Describe the probable benefits of the research for society.
This proposed program will provide stakeholders with an impact evaluation of the healthy homes intervention in terms of health behaviors and attitudes, injury, and asthma occurrence. Project activities will identify needs that exist among Nevada residents and will serve to collect data that otherwise are not yet available. This project will strengthen relationships and capacity of community partners and will leverage already existing resources to improve the health and quality of life for Nevada residents.

The research findings produced from this data will be applicable to a variety of health settings and community organizations. The Healthy Homes Program will help identify new problems relating to health outcomes in the home and will also confirm the existence of problems that we know exist but lack the scientific data to move forward. An example of such a case is asthma triggers in Nevada. We know that asthma is a problem, but data for Nevada is somewhat lacking and incomplete. It is vital for us to gather this data to help CDC establish recommendations for our community. Knowing what Healthy Homes issues are common in Nevada will help public health professionals know where to focus resources and efforts. The State of Nevada will benefit from this research because UNLV, a state funded university, will be able to give back to the community.

17. Costs to Subjects

A. Time Cost to Subjects

17.1 Amount of participation time:

Amount of participation time: Approximately 12 hours over 12 months.

B. Financial Information

17.2 Are there financial costs to the subject? ○ Yes ● No

17.3 Will subjects be paid or otherwise compensated for research participation? ● Yes ○ No

17.3.1 *If yes, please respond to the following questions:*

a) Describe the nature of any compensation to subjects. Include cash, gifts, research credit, etc.

At the initial follow up visit, residents will receive an intervention which will be one or all of the following, depending on the needs of each resident: educational materials, device intervention, or home remediation. At the completion of the study, the resident will receive a $50 gift card to Walmart for participating in the study that can be used to purchase home maintenance and cleaning supplies.

b) Indicate method(s) of payment.

☐ Cash

☐ Check

☐ Research Credit

☑ Other Payment: Walmart Gift Card

Provide a check dollar amount: $50.00

When and how is the Other Payment compensation provided to the subject?

The Southern Nevada Health District CLPPP will be notified once the participant has completed their last visit. At that point CLPPP will send a $50.00 gift card to Walmart for the purchase of home maintenance and cleaning supplies.

What is the effect on Other Payment compensation if a subject does not complete the study?

A participant who withdraws from the study will not receive the $50 gift card from Walmart. However, participants may receive device intervention (i.e. smoke detector, outlet cover, etc.) until the point at which they withdraw.

17.4 Is there any internal or external funding *(e.g., grants, contracts, gifts, etc.)* ◉ Yes ○ No

If yes:

17.4.1 Name of Sponsor or UNLV Grant Program:

Centers for Disease Control and Prevention Healthy Homes Strategic Partnership Alliance Grant

Attach a copy of the proposal and/or award document through the Supporting Documents Grid from the Home Page of CyberIRB.

Please note that externally funded protocols may require the completion of the Responsible Conduct of Research Training. Please check with the Office of Sponsored Programs for more information.

18. Conflict of Interest

18. Does a conflict of interest exist with this study?

○ Yes ◉ No

19. Signatures of Assurance

A. Investigator's Assurance

I certify that the information provided in this application is complete and accurate. As Principal Investigator, I have ultimate responsibility for the conduct of this study, the ethical performance of the project, the protection of the rights and welfare of human subjects and strict adherence to any stipulations designated by the IRB. I agree to comply with all UNLV policies and procedures, as well as with all applicable Federal, State and local laws regarding the protection of human subjects in research including, but not limited to the following:

Performing the project by qualified personnel according to the approved protocol.
Not changing the approved protocol or consent form without prior IRB approval (except in an emergency, if necessary, to safeguard the well-being of human subjects).
Obtaining proper informed consent from human subjects or their legally responsible representative, using only the currently approved, stamped consent form.
Promptly reporting adverse events to OPRS in writing according to IRB guidelines.
Arranging for a co-investigator to assume direct responsibility, if the PI will be unavailable to direct this research personally, as when on sabbatical leave or vacation.

******FACULTY ADVISOR (IF APPLICABLE): By my signature as Principal Investigator on this research application, I certify that the student/fellow investigator is knowledgeable about the regulations and policies governing research with human subjects and has sufficient training and experience to conduct this particular study in accordance with the approved protocol. In addition:***

I agree to act as the liaison between the IRB and the student/fellow investigator with all written and verbal communications.
I agree to meet with the student/fellow investigator on a regular basis to monitor the progress of the study.
I agree to be available and to personally supervise the student/fellow investigator in solving problems, as they arise.
I assure that the student/fellow investigator will promptly report adverse events to OPRS according to IRB guidelines.
I will arrange for an alternate faculty advisor to assume responsibility if I become unavailable, as when

on sabbatical leave or vacation.
I assure that the student/fellow investigator will follow through with the storage and destruction of data as outlined in the protocol.

Checking this box ☑ indicates that the Principal Investigator has read and understood the terms above. Checking the box above is your electronic signature and is required in order to submit this protocol to the IRB.

Please ensure your Supporting Documents have been added through the Protocol Summary Page (button on the left), and send your protocol by clicking the Send button from your Home Page.

APPENDIX 6

Consent and Assent Documents, Liability Waiver

The following legal documents were created by Mackenzie Burns, Erika Torres, and Sabrina La Monica under the direction of Dr. Shawn Gerstenberger at the University of Nevada Las Vegas, Department of Environmental and Occupational Health, 4505 Maryland Parkway, Box 45063, Las Vegas, Nevada, 89154. Input from community partners in the areas of health and housing was vital to the development of these legal documents.

These forms will be signed by program participants and have been approved by the UNLV Office for the Protection of Research Subjects prior to use.

For additional information regarding this protocol, please call 702-895-5420.

If you use materials from this questionnaire, please let us know by sending an email to shawn.gerstenberger@unlv.edu.

Thank you!

Healthy Homes Consent Form

TITLE OF STUDY: NEVADA HEALTHY HOMES PARTNERSHIP

INVESTIGATOR(S): Shawn L. Gerstenberger, PhD (702-895-1565), Sheniz Moonie, PhD (702-895-5843), Michelle Chino, PhD (702-895-2649), Erika Torres, MPH, Mackenzie Burns, MPH (702-895-5449), Jonathon LaValley (505-363-5126), Jennifer Berger (702-521-5638), and La Monica (702-587-4618).

SPONSOR: Centers for Disease Control and Prevention

Name of Participant: _____

Case Number: _____

Purpose

The Nevada Healthy Homes Partnership is doing a research study to identify and reduce health hazards that exist in the home environment among residents of Southern Nevada. Healthy Homes team members will research and identify hazards in the home related to asthma, unintentional injury, poisonings, and structural components of the home. This purpose will be achieved by conducting home assessments and providing healthy homes educational materials to those who participate in this study.

Procedures

If you choose to participate, researchers anticipate the duration of this study to be about 12 hours of your time, over a period of 6-12 months. Healthy Homes team members, each specially trained and certified, will visit your home on three or more separate occasions. The first visit will include the completion of enrollment forms as well as a complete Healthy Homes and Lead Risk Assessment where your home will be checked for safety hazards and health hazards. At this time, you will also complete questionnaires regarding your health and home environment.

After considering the condition and urgency of any hazards identified in your home, Healthy Homes team members will return for a follow up visit. At this time an intervention will be given: a personalized educational packet specific to your home needs; and when indicated a device such as a smoke alarm or fire estinguisher; and/or remediation to correct one or all of the hazards identified depending on available resources.

Over the duration of the study, three or more visits will take place. Once the intervention is provided, and all questionnaires and follow up visits take place, the study is complete. At this time, each participating household will receive a $50 gift card to Walmart, provided by the Southern Nevada Health District (SNHD), for the purchase of home mainteanance and cleaning supplies.

Risks

Risks of participating in this study are minimal. There may be some level of discomfort associated with home visits and answering questions about your home and health. Participation is voluntary and you can withdraw at anytime. There is no penalty or loss of benefits for those who chose not to participate.

Other important things to know:

Confidentiality will be maintained by storing all information collected in locked offices and file cabinets, and data will be evaluated using case numbers instead of names. Only researchers from UNLV will hve access to the study data and information. You are welcome to ask questions about the study at anytime.

Questions

If you do have questions about the research, your rights as a participant, or would like additional information please contact principle investigater Dr. Shawn Gerstenberger at (702) 895-1565 or shawn.gerstenberger@unlv.edu. If you have additional questions and would feel more comfortable talking to someone else, you can call the UNLV Office for the Protection of Research Subjects at (702) 895-2794.

Signing your name below indicates that you agree to be in this study.

☐ The check indicates that the above consent was read to the participant by the research team member.

Signature of participant: _____ Date: _____

Printed name: _____ Date: _____

Signature of person obtaining consent: _____ Date: _____

Printed name of person obtaining consent: _____ Date: _____

Healthy Homes Child Assent Form

This form must be completed for all children ages 7-18.

TITLE OF STUDY: NEVADA HEALTHY HOMES PARTNERSHIP

INVESTIGATOR(S): Shawn L. Gerstenberger, PhD (702-895-1565), Sheniz Moonie, PhD (702-895-5843), Michelle Chino, PhD (702-895-2649), Erika Torres, MPH, Mackenzie Burns, MPH (702-895-5449), Jonathon LaValley (505-363-5126), Jennifer Berger (702-521-5638), and Sabrina La Monica (702-587-4618).

SPONSOR: Centers for Disease Control and Prevention

Name of Participant: _____

Case Number: _____

We are doing a study to help make your home safer and healthier. We will be asking you questions about your home and about your health. This information will help us know what you need to make your home a safer, healthier, and happier place.

If you agree to be in our study, you and your parent/guardian will complete a questionnaire about your home and health. We want you to tell the truth because this information is very important.

You can ask questions about this study any time. There are no right or wrong answers.

If you sign this paper, it means that you have read this and would like to be in the study. If you do not want to be in our study, don't sign this paper. Being in the study is up to you and you can change your mind at any time.

Your signature: _____ Date: _____
Your printed name: _____ Date: _____
Signature of person obtaining consent: _____ Date: _____
Printed name of person obtaining consent:_____ Date: _____

CONSENT TO PARTICIPATE IN "HEALTHY HOMES" PROGRAM AND GENERAL RELEASE OF LIABILITY

This *Consent to Participate in "Healthy Homes" Program and General Release of Liability* ("Release") is made by _____ ("Participant") in favor of the Board of Regents of the Nevada System of Higher Education, on behalf of the University of Nevada, Las Vegas ("UNLV"), and is based on the following:

Description of Program

1. UNLV's School of Community Health Sciences has obtained a grant (the "Grant") from the Centers for Disease Control and Prevention, an agency of the United States Department of Health and Human Services (the "CDC") to identify, and in some instances correct, health hazards in private homes.

2. In accordance with the Grant, and in cooperation with the Southern Nevada Health District ("SNHD"), an agency of the State of Nevada, UNLV has established a "Healthy Homes" program in which UNLV students and faculty members ("UNLV Team Members") perform in-home inspections to identify hazards related to asthma, injury, poisoning, and structural problems. The Healthy Homes program is offered without cost to the Participant.

3. The Healthy Homes program involves three or more visits to a Participant's home over a period of 6 to 12 months. Each visit will last between 2 and 4 hours.

4. During their initial visit, UNLV team members will ask the Participant to complete an enrollment form and answer a questionnaire regarding the Participant's personal health and the condition of his or her home. Afterwards, UNLV Team Members will perform a series of inspections and tests that include the following:

    - Detection of volatile organic compounds, such as, carbon monoxide.
    - Detection of Lead-based paint using an X-ray Fluorescence handheld device.
    - Identification of moisture problems in the home using a moisture detector.
    - Identification of safety hazards that can lead to injury.
    - Identification of pests through a visual assessment.

5. In one or more subsequent visits, UNLV Team Members will provide the Participant with an educational "tool kit" to assist the Participant in identifying safety hazards in the home. UNLV Team Members will meet with the Participant to discuss the results of their inspection and to advise the Participant on ways to reduce risks in the home.

6. Depending on available resources and funding, UNLV may assist the Participant in the correction of certain hazards found in the home, including the following:

    - Providing cleaning materials such as a mop, broom, bucket, and/or trash can with a lid.
    - Providing safety equipment such as a smoke alarm, carbon monoxide-detector, and/or fire extinguisher.

7. If the Participant meets certain financial qualification criteria, UNLV may arrange for the remediation of certain structural safety hazards in the home.

8. UNLV Team Members will conduct a final home visit in which the Participant will be asked to complete a final set of questionnaires about his or her personal health and home. UNLV Team Members will also re-evaluate the Participant's home for safety and health hazards and perform one or more of the following inspections:

    - Detection of volatile organic compounds, such as, carbon monoxide.
    - Detection of Lead-based paint using an X-ray Fluorescence handheld device.
    - Identification of moisture problems in the home using a moisture detector.
    - Identification of safety hazards that can lead to injury.
    - Identification of pests through a visual assessment.

9. The Healthy Homes program will *not* include tests to determine the presence of asbestos or radon gas.

10. Upon completion of the final visit, the household will receive a $50 gift card to Walmart to purchase cleaning supplies.

Agreement and Release

Based on the foregoing, the Participant agrees as follows:

A. **Consent to Participate in the Healthy Homes Program**. Participant agrees to participate in the Healthy Homes program and consents to the use of all information and data, including photographs, video, film and other images, obtained by UNLV Team Members for analysis and publication. Participants agree to allow UNLV, CDC and/or SNHD to use survey responses and other data for research on housing and health. UNLV will remove all identifying information such as names, addresses and telephone numbers prior to using data for research or publication. Each Participant will be assigned a unique identifying number, which shall be kept confidential. All information will be entered into a password protected computer and any physical data files will be secured. No personal information will be used in any reports or publications that may result from this program. UNLV will retain information acquired during this program for as long as required by State and/or Federal law and regulation.

B. **Acknowledgment of Risks of Program Participation**. The Participant acknowledges that there may be some level of discomfort that may come with home visits and answering questions about his or her home and health. If the Participant is uncomfortable answering any of the questions in this study, he or she is free to skip those questions or discontinue participation in the program. Participation is voluntary and the Participant can withdraw at any time, although only those persons who complete the program will be eligible to receive a $50 Wal-mart gift card. The Participant also acknowledges that there may be risks associated with any corrective action taken in his or her home, including the removal and replacement of building materials, the use of tools and other construction equipment. The Participant will comply with all reasonable requests made by any contractor performing work on his or her property to ensure the safety of the Participant, UNLV Team Members and others.

C. **Release of UNLV, CDC and SNHD**. Participant acknowledges that the inspection of his or home is not comprehensive and that additional risks may exist beyond those (if any) identified by UNLV. Participant agrees that UNLV's inspection is for research purposes only and may not be relied upon by the Participant for any reason. Participant acknowledges that risks may be identified by UNLV that do not in fact exist (a "false positive") and that UNLV may fail to observe risks that do in fact exist (a "false negative"). UNLV does not warrant the accuracy of any tests and advises the Participant to obtain independent verification of the condition of his or home by appropriately licensed professionals. If any corrective actions are proposed, work will be performed by a third party contractor. The Participant agrees that any claims arising from such work will be solely the responsibility of the third party contractor and not UNLV, the CDC and/or SNHD. Participant releases UNLV, CDC and SNHD, together

with their employees, agents and other representatives, from all claims, arising out of his or her participation in the Healthy Homes program.

I have read, understand and agree to all terms and provisions of this Release.

Signature of participant: _____ Date: _____

Printed name: _____ Date: _____

Signature of person obtaining consent: _____ Date: _____

Printed name of person obtaining consent: _____ Date: _____

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CIRRICULUM VITAE

Graduate College
University of Nevada, Las Vegas
Sabrina La Monica

Degrees:

Bachelor of Science, Psychology 2009
Brigham Young University

Bachelor of Science, Public Health Education 2009
Brigham Young University

Special Honors and Awards:

Phi Eta Sigma Scholar, 2005
Dean's List for 4.0 GPA, 2006
Academic Scholarship Recipient, 2006-2007

Thesis Title: Identifying and Correcting Hazards in the Home: A Pilot Test Among Homes in Clark County, Nevada

Thesis Examination Committee:

Chairperson, Shawn Gerstenberger, Ph. D.
Committee Member, Sheniz Moonie, Ph. D.
Committee Member, Melva Thompson-Robinson, Dr. PH.
Graduate Faculty Representative, Jennifer Keene, Ph. D.