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Health Impact Assessment of Proposed Rental Housing Policy Within Clark County, Nevada, USA

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HEALTH IMPACT ASSESSMENT OF PROPOSED RENTAL HOUSING
POLICY WITHIN CLARK COUNTY, NEVADA, USA

By

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A dissertation submitted in partial fulfillment
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Doctor of Philosophy - Public Health

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Health Impact Assessment of Proposed Rental Housing Policy within Clark County,
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ABSTRACT

Health Impact Assessment of Proposed Rental Housing Policy Within Clark County, Nevada, USA

by

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Dr. Shawn L. Gerstenberger, Examination Committee Chair
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Homes serve as a central function of our everyday lives, they are where most Americans spend a significant amount of time and money. The quality of our homes can impact our health. Poor housing can cause and contribute to preventable diseases and injuries, such as the development or exacerbation of asthma, neurological deficits, cardiovascular diseases, and cancer. According to the American Housing Survey (2013) approximately 5.8 million homes, of 132 million homes in the United States, are in moderate to severe physical disrepair, with rental housing being at a disproportionate burden. According to 2013 U.S. Census, Clark County, Nevada has 713 thousand occupied housing units of which 2,855 lack plumbing and 4,281 units lack a kitchen.

This project evaluated the impacts of the Southern Nevada Health District's proposed Rental Housing Policy, which aims to improve rental housing in Southern Nevada, by conducting a Health Impact Assessment (HIA). The health impact assessment identified inequities in essential service housing complaints. A significant relationship was found between residents earning below 80% median income and those who have gone without power, water, gas or ability to cool or heat their home. Analysis of Nevada BRFSS Adult Call-Back survey suggest that renters are 21% more likely to experience an asthma attack or episode than non-renters, a 25% increase in experiencing

an asthma episode or attack among those who have more than 6 environmental asthma triggers in the home compared to those who report 1-2 triggers, and a 12% increase among those who report 3-5 triggers in the home compared to those who report 1-2 triggers. Although models suggest an increase in the odds of an asthma episode or attack among renters or those with greater number of environmental triggers all models failed to reach statistical significance.

Qualitative analysis indicated an overall need for rental housing policy and revealed concerns with displacement, adequacy of resolving housing complaints and specific vulnerabilities among those with a disability and those who report less than perfect credit. This HIA provides recommendations for implementation of rental housing policies that consider integration of housing agencies in Clark County, sustainability, marketing, education, changes to the current policy draft to improve housing & health equity, data management & monitoring, as well as, alternative scenarios that consider the impacts on determinants of health and limitations in funding.

Key words: housing, housing tenure, health impact assessment, housing inequities, environmental toxicants, displacement, public housing, social capital and social determinants of health.

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Dr. Gerstenberger not only created an environment in which I could grow as a researcher, but provided unwavering support, trust and faith in my abilities to complete any given task. I will always admire your ability to inspire people to work towards a common goal for a common good. Dr. Chino you are an amazing teacher and an incredible mentor. You set the foundation for much of my work as you taught me about the social disparities that exist in this world and the ways in which we can go about making change. Dr. Carolee Dodge Francis, I will be always grateful to you for teaching me about the richness and depth to qualitative research. Your guidance and mentorship allowed me to gain the depth I was seeking for this project. It has been a great experience working with you and receiving your invaluable guidance. Dr. Sheniz Moonie I thank you for your support and for teaching me years of statistics, but most important for your patience and willingness to guide me through the dissertation process. I'm also incredibly grateful for the mentorship and guidance of Max Gakh. Your guidance in conducting a Health Impact Assessment was invaluable. I thank you deeply for so carefully reviewing my dissertation throughout every stage of the process and providing such constructive feedback. No doubt this paper is better because of your constant support and guidance. Dr. Jennifer Keene, I appreciate your valuable time and input into making my project better. You all have qualities I aspire to develop.

This project has allowed me to develop my skills as a researcher, but most importantly allowed me to utilize my skills in developing community-based approaches that assist communities in most need. The PhD program taught me more than I ever thought I would learn.

It taught me to not only embrace science, but also to challenge science. I will forever be thankful to the entire faculty and graduate students in the PhD program for contributing to my understanding of research, to my understanding of social aspects that affect health and most of all to understanding the importance of our work.

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To my mom:

If I had to pick one person who has been my relentless cheerleader throughout my entire life it is you. Your unwavering support and dedication to my success has been nothing less than phenomenal. You have believed in me when sometimes I didn't even believe in myself. Thank

you mom for all you have done for my family. I hope to have made you proud of me! The success of completing my dissertation is just as much mine as it is yours.

To Alex and Silvia:

I'm not sure exactly what I did to deserve the two of you, but there is no doubt that Heavenly Father has blessed me immensely with you both. Your selfless service to my family and me, as I complete this last stage of my academic career, has not gone unnoticed. You have taken care of us during the hard times in our lives and have been with us through some of the most amazing ones. I only wish to be able to repay you both for all you have done for me with the same love and selfless service you have shown me. I love you guys and thank you immensely.

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I didn't have the gracious opportunity to meet Yvonne before she left this world, but I'm so grateful to her for the blessings that have been bestowed upon me for having such wonderful children. You have not allowed the distance between us to keep you from offering your encouragement and support. I thank you for the time and edits you made to my dissertation but most importantly for being a wonderful sister-in-law, sister and aunt. I love you dearly and only hope to give back the same support and love you have shown me. I'm blessed to be a part of the Marquez Family.

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You all have been my beacon of support and have always believed in me and my ability to accomplish more than I could have imagined. I have been truly blessed. I'm humbled by the love, service and guidance that many of you have provided me. I only hope to be able to offer those same qualities to others as I embark into the future. I humbly thank you for your patience and most of all for your faith in me. I could have not made it through this last phase of my academic career without you all. And last but not least, I thank my Heavenly Father. If not for my faith and testimony I would not have accomplished all that I have and would not be the wife, mother, daughter, sister, aunt, friend and person I am today.

DEDICATION

To my family for all their faith, love and support!

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LIST OF ABBREVIATIONS

BRFSS	Behavioral Risk Factor and Surveillance System
CHW	Community Health Workers
HIA	Health Impact Assessment
HUD	Department of Housing and Urban Development
IOM	Institute of Medicine Report
LTH	Landlord-Tenant Hotline
NHHP	Nevada Healthy Homes Partnership
NRS	Nevada Revised Statutes (NRS § 118A.290)
RHP	Rental Housing Policy
SNHD	Southern Nevada Health District

CHAPTER 1: INTRODUCTION

Health follows a social gradient that leads to differences within populations, disproportionately affecting those of lower social economic statuses (Graham, 2007). The factors that contribute to inequalities in health are referred to as social determinants. The World Health Organization defines social determinants as the “conditions where we live, work and play” (Health, 2008). This can include access to health care, schools, education and goods and services; in addition it encompasses the quality and condition of homes, neighborhoods and communities. As a result of disparities in each facet previously mentioned, a growing body of research, practice and policy has grown over the last several decades with a focus in obtaining health equity in order to reduce health disparities and the burden of disease on certain populations.

A greater focus on housing as a social determinant of health has increased on the federal, state and local levels in recent years even though the relationship between housing conditions and health have been established long ago. The industrial revolution highlighted a clear deficit in housing marked by families living in severe overcrowding and in homes improperly ventilated, damp and unclean (Shaw, 2004). Housing has vastly improved since the 18th and 19th century, however a lack of adequate housing still exists today. Research over the last several decades has provided a wealth of data to support the connection between housing and direct and indirect consequences to health. Housing conditions contribute to health outcomes that include respiratory conditions such as asthma, lead poisoning, unintentional injuries and communicable diseases (Galson, 2009; Krieger & Higgins, 2002; Shaw, 2004). Furthermore, housing tenure has been correlated with poorer health outcomes and with poorer housing conditions, with those in rental housing being disproportionately burdened (Filakti & Fox, 1989; Fogelman, Fox, & Power, 1989). As a result a significant investment has been made on the federal, state and local levels to improve

housing over the last several decades typically by direct remediation or housing interventions. However, the development and implementation of policies to correct housing deficiencies has begun to regain momentum.

As we begin to think of policies as a viable recourse to address housing in the United States it offers the opportunity to incorporate the processes of a Health Impact Assessment (HIA) into the decision making. An HIA is a structured and systematic process used to evaluate the health impacts of a population due to a proposed, policy or program (Birley, 2011; Kemm, Parry, & Palmer, 2004). It takes “health” into consideration before implementation and explores the potential impacts among vulnerable populations. An HIA is a six step process which includes screening, scoping, assessment of health effects, recommendations, and reporting & monitoring (Bhatia, 2011). HIA’s are used across various sectors from air, climate, and food, to land use, noise, transportation, water, work and housing.

In Nevada rental housing is governed by the landlord-tenant chapter of Nevada Revised Statue (NRS) § 118A which requires landlords to maintain “the dwelling unit in a habitable condition” (NRS§118A.290, 2014). However, the Southern Nevada Health District (SNHD) does not have the ability to enforce NRS § 118A. In 2009, the SNHD drafted rental housing policy to address substandard rental housing in the county and to gain authority to enforce (NRS) § 118A. The focus of this study will be to use an HIA to evaluate the potential health benefits and adverse health consequences of implementing the proposed policy entitled the “*Southern Nevada Regulation Governing Public Health in Housing*” herein referred to as Rental Housing Policy. The HIA aims to characterize asthma health and housing complaints; while also determining if differences exist in housing resolutions among Clark County renters and if inequities and vulnerable populations, that may be disproportionately affected by Rental Housing Policy, be

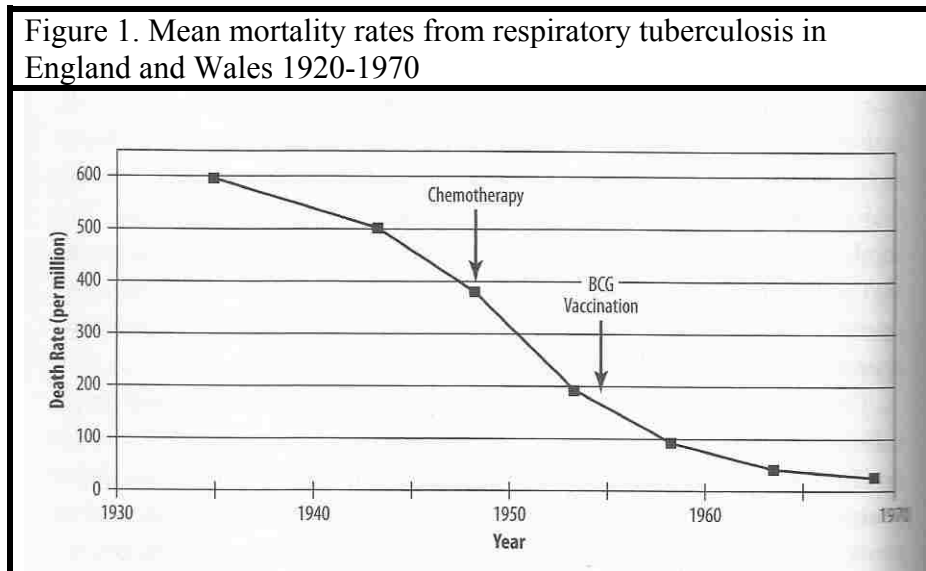
identified through the HIA process. Finally this HIA intends to provide recommendations and design alternatives that maximize housing and health equity.

CHAPTER 2: REVIEW OF RELATED LITERATURE

Housing as a Social Determinant of Health

The World Health Organization defines social determinants of health as “conditions in which people are born, grow, live, work and age (Health, 2008)”; conditions such as housing quality, access to medical services, and/or employment opportunities (Bambra, et al., 2010). These circumstances are often related to unequal distribution of money, power and resources among and within localities, cities, counties and nations (WHO, 2014); leading to a social gradient in which those who are on the lower end of the income spectrum have shorter life expectancies and suffer from more diseases (Braveman & Gruskin, 2003; Wilkinson & Marmot, 2003).

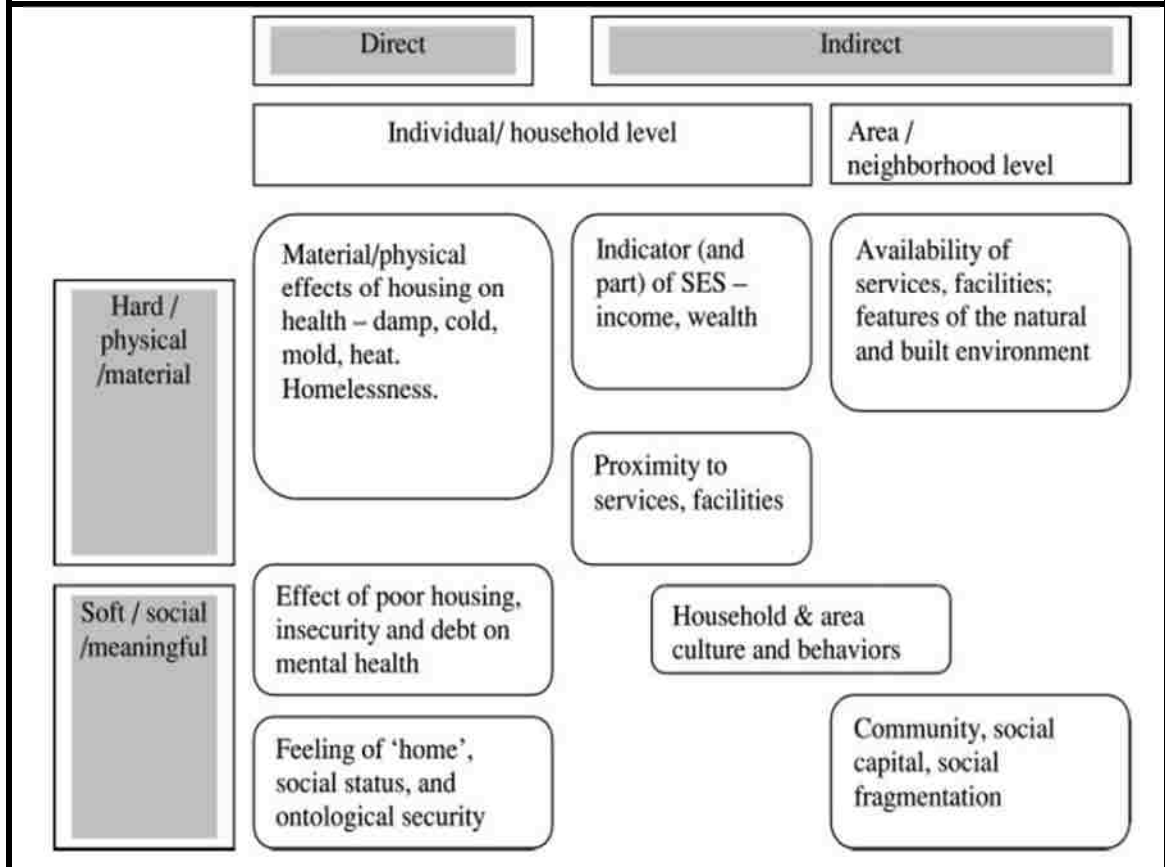
Increasing access to health care has been the focus within many developed countries including the United States to improve health and has resulted in large economic investments to increase access. However, access to health care is only one of the many facets that influence health. Barr (2014) suggests that our health status has much more to do with where we fall on the social and economic hierarchy (Barr, 2014). For example if we can examine mortality rates due to tuberculosis in England and Wales from 1930-1970, rates declined by 51% from 1948-1971 (Figure 1.); a significant decline which occurred before the introduction of a vaccine. What was the reason of the decline? The nineteenth and twentieth century marked a rise in public health standards which included increasing our standard of living; better nutrition, sanitation, and housing; less crowding; and strengthened measures to prevent the spread of infectious diseases (Barr, 2014). The direct physical influence of housing on health has a strong historical context and resulted in precipitating changes in the workplace as well as the conditions in which we lived. Prior to this, people lived in “overcrowded, high-density, poorly ventilated, damp and unclean housing” (Shaw, 2004).



(Barr, 2014)

How exactly does housing impact health? The answer is quite complex. Gibson et al. (2011) suggests that housing influences health through three pathways which include housing conditions, area characteristics and housing tenure (Gibson, et al., 2011). Shaw's (2004) conceptual model of housing and health indicates a variety of influences which include hard factors, soft factors and direct and indirect impacts to health (Figure 2). Hard and direct impacts refer to the physical environment in which people live which can include the presence of damp conditions and mold, or inadequate ability to heat and cool our homes. The hard and indirect impacts include one's socio-economic status and characteristics of our communities and neighborhoods which include the availability or lack of services, from education, health care services, to access to healthy food, all of which can influence our health. Soft and direct factors include the effects of poor housing conditions and housing security. Soft and indirect factors account for a person's sense of well-being, sense of connectedness and community, and identifying with shared values (Shaw, 2004).

Figure 2. Logic model of the direct and indirect ways housing functions as a determinant of health



(Shaw, 2004)

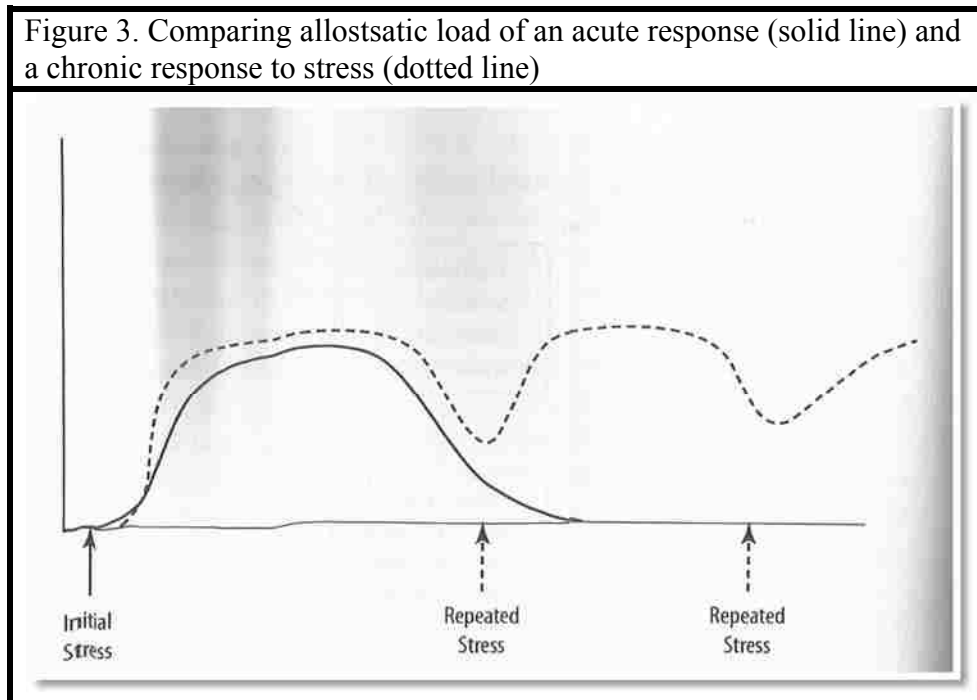
The built environment has profound effects on one’s health. Research suggests that there is a connection between poor urban planning and inadequate housing to physical and mental health problems like anxiety, depression, attention deficit disorder, substance abuse, aggressive behavior, asthma, heart disease and obesity (Sirinivasan, O’Fallon, & Dearry, 2003). The health burden, however, is not equal. The poor are disproportionately affected by substandard housing conditions and are significantly at greater risk for exposure to lead-based paint hazards, pests, air pollutants, contaminants, and conditions that can serve as a stressor that affect the human immune system (Sirinivasan, O’Fallon, & Dearry, 2003).

Stress: Connecting Housing, Poverty & How it Leads to Poor Health

Housing serves as an indicator of socio-economic status (Macintyre, et al., 2003; Shaw, 2004) and poor health is connected to socio-economic status. The question is then, how are housing, poor health and socio-economic status interconnected? McEwen and Lasley (2002) suggest that connection lies in internal and external environment of where we live; the heavy cost of being poor is related to the chronic stress one is under. “Prolonged or severe stress has been shown to weaken the immune system, strain the heart, damage memory cells in the brain and deposit fat at the waist rather than the hips and buttocks (a risk factor for heart disease, cancer and other illnesses) ... Stress may be the thread tying together many illnesses that were previously thought unrelated (McEwen & Lasley, 2002).” Our body is a complex system that has developed ways to respond to stress. For instance, under a stressful situation the body provides the needed energy to respond to the event; in the most ideal of circumstances the body functions best when it is allowed to respond in small increments in order for it to recover (Barr, 2014). When someone experiences chronic stress the system is weakened, causing a less effective response to situations, leaving the body vulnerable to stressors such as illness and injury due to a weakened immune system (Barr, 2014; McEwen B. , 2008).

How hormones respond can help explain this further. The hypothalamus serves many important functions one of them being our response to stress. The body responds to stress in both a conscious and unconscious way. It is the hypothalamus that provides the conscious response; sending messages to the pituitary gland which then sends the communication signals to secrete hormones into the blood stream to target the adrenal gland. The adrenal gland then releases epinephrine and norepinephrine; then at a slower rate begins to release cortisol. The process is referred to as hypothalamic-pituitary-adrenal axis or allostatic load (Barr, 2014; McEwen B. ,

2008). Once the body reaches its maximum allostatic load the body then reverts back to normal; however, it takes a longer period of time to get back to normal (Figure 3.).



(Barr, 2014)

During chronic exposure to stress, hormones will plateau as seen in an acute response. What differs is the body's ability to fully recover. In fact it doesn't fully recover and continuously secretes stress hormones in the body. The chronic secretion of hormones can lead physiologic injuries such as inflammation in cells lining the inner wall of small arteries; scarring of the walls of blood vessels; increase in inflammatory biomarkers in the blood; and increase in stiffness of the walls of blood vessels (Barr, 2014; McEwen B. , 2008; Toda & Nakanishi-Toda, 2011). Chronic stress can have a considerable impact on health. Living in poverty, poor housing conditions and many other factors can serve as the pathway to increased stress and poorer health.

The Impact of Poor Housing

According to the US Census, 6% of all U.S. residents and 14% of low-income renters live in homes with severe or moderate physical disrepair, which includes water leaks that can lead to mold growth and consequently trigger an allergic reaction and asthma attack (Galson, 2009). The incidence of poor housing conditions is highest among minority renters in non-urban areas then owner-occupied dwellings and other renters (Galson, 2009). Safety measures such as gates for the stairs, safety latches on cabinets as well as controlled thermostat settings are substantially less likely to be found among minority parent households compared to white parents (Galson, 2009). High-density housing can influence negative psychological health in the poor and affluent homes alike. In 2005, about 2 million people in the United States lived in severely inadequate homes (Census, 2011). The American Housing survey defines inadequate homes as homes without heat, hot water, electricity and/or homes that lack maintenance or have structural problems.

Understanding the connection between housing and poor health is a complex one since we have to consider a multitude of factors that can contribute to health outcomes as a result of living in substandard housing (Seto, et al., 2009). Micro level characteristics include the design and maintenance of a home. This includes the integrity of the home's structure, how well it's maintained and safety features, which all can contribute to an increased the risk of injuries, exposure to lead poisoning, and even exacerbate other conditions. Poor indoor air quality can lead to cancers, cardiovascular diseases and respiratory illness; while poor water quality can lead to gastrointestinal illness (Galson, 2009). Furthermore exposure to toxic chemicals can cause reproductive problems, neuropsychological deficits and behavioral problems. Macro level characteristics such as affordability can lead to nutritional deficits; and a combination of both

macro and micro effects can lead to mental health problems like anxiety and depression (Galson, 2009; Krieger & Higgins, 2002; Seto, et al., 2009).

Respiratory health is the most prevalent condition related to housing. Factors that contribute to respiratory health include indoor air quality, damp indoor spaces and mold (Galson, 2009). The Institute of Medicine (IOM) examined the connection between indoor air quality and the development and exacerbation of asthma. Outcomes of the IOM report indicate that the development of asthma in children has a causal relationship with the presence of house dust mites with those sensitized to dust mites (IOM, 2000). An update to the IOM report indicates suggestive evidences of an association between dust mites and exacerbation of asthma among adults with a sensitivity or not (Kanchongkittiphon, Mendell, Gaffin, Wang, & Phipatanakul, 2015). The updated IOM report indicates evidence of an association between exposure to environmental tobacco smoke (ETS) and exacerbation of asthma among pre-school aged children and suggestive evidence of an association between chronic exposure to the exacerbation in older children and adults; further confirming suggestive evidence between acute exposure of ETS and the exacerbation of asthma among those who are sensitive to ETS exposure (IOM, 2000; Kanchongkittiphon, Mendell, Gaffin, Wang, & Phipatanakul, 2015). In addition, the report indicated the exacerbation of asthma to have a causal relationship with the presence of cats, cockroaches, house dust mite and environmental tobacco smoke (IOM, 2000; Kanchongkittiphon, Mendell, Gaffin, Wang, & Phipatanakul, 2015). Kanchongkittiphon & colleagues (2015) indicate there is suggestive evidence that exposure to cockroach allergens among non-sensitized children can exacerbate an attack. Exacerbation of asthma is also associated with the presence of dog dander, fungi, dampness and nitrogen oxides (IOM, 2000; Kanchongkittiphon, Mendell, Gaffin, Wang, & Phipatanakul, 2015).

Homes that are damp create the ideal environment to allow the growth of mold and fungi. It is estimated that 4.6 million people in the U.S. who report asthma is a result from dampness and mold in their home (Mudarri, 2007). The presence of damp environments is associated with upper respiratory symptoms, coughing, wheezing and asthma in sensitized persons (Galson, 2009; IOM, 2000). The presence of mold is also associated with these symptoms but also is associated with the presence of hypersensitivity pneumonitis in susceptible persons (Galson, 2009; IOM, 2000). In a case-control study of 122 doctor-diagnosed adult asthma sufferers in Glasgow found that damp housing was associated with asthma, reporting a dose-response relationship (Shaw, 2004). Respiratory health can also be impacted by radon gas, carbon monoxide and environmental tobacco smoke.

The incidence, prevalence and hospitalization rates of asthma in the United States are disproportionately higher in poor communities and highest in poor minority children (Rauh, Landrigan, & Claudio, 2008). Research has demonstrated that childhood asthma prevalence in certain low-income minority neighborhoods to be as high as 23%, almost 4 times the national average (Rauh, Landrigan, & Claudio, 2008). Data from the National Hispanic Health and Nutrition Examination Survey indicates variations in asthma prevalence rates within Hispanic subgroups: 5.2% in Cuban American children, 2.7% in Mexican American children, and 11.2% in Puerto Rican children (Rauh, Landrigan, & Claudio, 2008).

Grineski and Hernández (2010) conducted a study to evaluate the relationship between child asthma health and contributing environmental exposures among families who rent in South Phoenix, Arizona. Families of asthmatic children were recruited through 31 public schools and two private schools via mail. A total of 53 open-ended interviews were conducted among parents whose children suffer from asthma. Interview questions consisted of asthma health, access to

health care, schooling, housing, environment (including indoor environment) and family. In addition, families were asked about pros and cons of their current residence, asthma triggers, barriers to managing their child's asthma and if any they had made any asthma-related modifications to their home to address asthma concerns. Of the 53 respondents 19 were renters. It was found that the families who rented lived in poorer quality housing and that housing conditions were impacting their child's health. Some tenants reported landlords aided in making modifications to the dwelling to help improve asthma health, while others ignored requests to fix problems. Immigrant families were at greater risk to being exposed to poorer housing conditions from fear of eviction and possible deportation. This imbalance of power often leads to a lack of landlord cooperation. In general, families in rental units lived in far greater substandard housing conditions which included holes in roofs, collapsed ceilings, rodent and insect infestations, no heat or air conditioning, gaps under door, no doors, and/or boarded up or broken windows. Environmental factors not only contribute to poorer respiratory health conditions but also can contribute to neurological deficits, particularly when exposed to lead-based paint.

Jones et al. (2009) reports that between 1999 and 2004 approximately 240,000 children between the ages of 1-5 years of age had blood lead levels above 10 ug/dL (Jones, et al., 2009); most often children were exposed at home. Lead-based paint was banned in 1978 but the exposure to lead remains as a result of a lack of or deferred maintenance or through renovation processes that are done without the use of lead-safe work practices. In 2002 Jacobs et al. (2002) reported that in the U.S. there are 1.2 million homes with lead-based paint hazards and the homes to children 5 years old and under (Jacobs, et al., 2002). Exposure to lead paint can lead to impaired neurological development in children and produce cognitive and behavioral effects (Shaw, 2004).

Housing Interventions & Asthma Health

In the United States asthma continues to be a serious health concern. As a chronic condition it leads to hospitalizations, emergency department visits, missed days of work, missed days of school and associated deaths. The economic cost amounts to \$56 billion dollars annually for the U.S (CDC, 2010). In 2013, 16.5 million adults and 6.1 million children had asthma (CDC, 2013). Data indicates that in the last decade asthma rates have increased nearly 15% (CDC, 2010). The recommendation from the Centers for Disease Control and Prevention is that all those with asthma should have an asthma action plan. An asthma action plan is utilized to medically manage asthma by identifying asthma triggers that can lead to an attack and identifying when to use controller versus rescue medicines or when to seek medical assistance. Although recommended for all those with asthma, less than 1 in 2 children and less than 1 and 3 adults obtain an asthma action plan from their doctor (CDC, 2010). The medical management of asthma is a critical component in controlling asthma symptoms and attacks; however, asthma rates remain stable or have increased in certain communities. A growing body of work has been published to review the effectiveness of improving the home environment as a means to improving asthma health; a review of some of this work is found below.

The Inner City Asthma Study conducted by Morgan et al., (2004) was one of the first comprehensive studies to examine the effectiveness of home-based environmental interventions among urban children with asthma. Urban children are exposed to multiple asthma triggers that contribute the increased risk of developing asthma and/or exacerbating asthma symptoms (Morgan, et al., 2004). Children ages 5 through 11 who have diagnosed asthma from research centers across the United States were enrolled for a total sample size of 937. Children were randomly selected into an intervention group or a control group during the two year study period.

Asthma health questionnaires and skin testing for allergens was performed at baseline, after which a visual assessment of the home was completed and dust samples collected from the child's bedroom. Families in the control group received home visits every six months. The goal of the intervention group was to provide families with education and equipment and supplies needed to address environmental asthma triggers. Research team members conducted 5 to 7 home visits focused on providing the families the motivation and skills to address environmental asthma triggers. The intervention group was provided with allergen-impermeable mattress and pillow covers, vacuums, air purifiers and pest control as needed. Follow-up visits to conduct a visual assessment of the home and collect dust samples occurred at 6, 12, 18 and 24 months.

The study found that the intervention group had fewer days with symptoms and greater declines in levels of allergens in the home. It also found a slight difference in the number of health care visits in the intervention group. Further, a reduction of cockroach allergen and dust-mite allergen were significantly correlated with reduced complications of asthma (Morgan, et al., 2004); thus reducing asthma symptoms, exacerbations, attacks and health care usage. Intervention costs per year are estimated at \$750 to \$1000. The reduction in asthma morbidity among the intervention group resulted in 2.1 fewer unscheduled visits per year, 21.3 fewer days with symptoms and 4.4 fewer days of missed school (Morgan, et al., 2004).

The Department of Public Health Seattle-King County conducted a randomized controlled trial to examine the effectiveness of high and low-intensity intervention efforts in improving asthma health utilizing Community Health Workers (CHWs). In order to meet eligibility criteria households had to have a child from the ages of 4-12 with persistent asthma (using asthma rescue medication at least 4 days during the previous 2 weeks or waking at night because of asthma at least twice during the previous month) living in the them at least 50% time; diagnosis from a

medical professional; income below 200% of federal poverty or enrolled in Medicaid; and be located in King County. Participants were recruited from clinics, hospitals, emergency departments and community agencies and were randomly assigned into the high and low intensity groups.

The high-intensity group received intervention for a year and included an average of seven visits by CHWs. The initial visit included an environmental assessment to identify asthma triggers which then formed an action plan for the family. Follow-up visits were conducted to encourage follow-through of the action plan, provide one on one education and support, and deliver materials to reduce asthma triggers (allergy control, pillow and mattress encasements, low-emission vacuums, door mats, cleaning supplies, & pest control supplies) (Krieger, Takaro, Song, & Weaver, 2005). The low-intensity intervention group only received one visit from a CHW to conduct an environmental assessment, develop an action plan to address asthma triggers, provide limited one-on-one education and provide bedding encasement(s).

The study compared the differences between primary and secondary outcomes between the two intervention models. Primary outcomes included days with asthma symptoms within the last two weeks, caregiver quality of life, and utilization of health care services in the last two months. Secondary outcomes include number of days in the last two weeks in which activity was limited, the use of beta and controller medications, and the days of missed school or work.

Results from the study indicated significant improvements among those in the high-intensity intervention group; statistically significant for use of urgent care services and caregiver quality of life. Although decline in asthma symptom days was not statistically significant between the low and high-intensity groups the high-intensity intervention group experienced an overall decline in asthma symptom days. Behavior changes to reduce asthma triggers were higher among

the high-intensity intervention group. Overall the high-intensity intervention group experienced significant improvements in caregiver quality of life, asthma symptoms, and health care utilization. Cost analysis indicates urgent care usage during the last two months of the study to be lower among the high-intensity group. The estimated decrease in 2-month costs between baseline and last visit are \$185-\$315 in the low-intensity group and \$201- \$334 per child in the high-intensity group per child. The high-intensity marginal cost per child of \$1124 with a savings in urgent care cost in a 2-month period from \$57 to \$80 per child. This could indicate a projected 4-year net savings among the high-intensity group at \$180-\$721 per child (Krieger, Takaro, Song, & Weaver, 2005).

A community-based participatory study conducted by Parker et al., (2008) evaluated the reduction of asthma triggers in the home environment utilizing CHWs. Similar to the Krieger et al., (2005) mentioned above families were divided into an intervention group or a control group. A total of 298 households with a child between the ages of 7 to 11 participated in the study (intervention group n=150; control group n=148). The intervention group was studied over a year and received multiple visits. The intervention group was provided with a HEPA vacuum, mattress and pillow cover, cleaning supplies, integrated pest management services, and education. The children in both groups completed a skin prick test for nine common aeroallergens and allergens were assessed in the child's bedroom with the collection of dust samples at baseline and at final follow-up. The study found improvements in lung function (Forced Expiratory Volume and daily nadir Peak Flow) which resulted in the reduction of symptoms such as persistent coughing and exercise induced coughing among the intervention group (Parker, et al., 2008). Those in the intervention group also experienced a decrease in the frequency of two symptoms; cough that won't go away and coughing with exercise. In addition, the study found a reduction of children who utilized medical services to treat asthma, a reduction in inadequate use of controller

medication, a reduction in depressive symptoms among caregivers, and a reduction of dog allergens in dust. It also found an increase in behavior change to reduce asthma triggers among the intervention group (Parker, et al., 2008).

A partnership between Seattle Housing Authority, Neighborhood House, Public Health of King County and the University of Washington obtained \$1.8 million in healthy homes funding to build 60 Breathe Easy Homes (BEH) to improve the quality of housing for public housing residents, particularly for those who have children with asthma. The Public Health Department of Seattle- King County has done considerable amount of work toward improving asthma morbidity with the use of Community Health Workers (CHWs) whose focus has been to provide asthma management support and help families address asthma triggers in the home. The use of CHWs has shown to reduce asthma morbidity and improve quality of life but is limited in addressing structural deficiencies of a home (Takaro, Krieger, Song, Sharify, & Beaudet, 2011). The collaboration among several different agencies and the acquisition of federal funding allowed incorporating the use of CHWs with the construction of 60 BEHs. BEHs were designed and constructed to reduce moisture by moisture proofing the home, to use materials that minimize dust and off-gassing, and to provide fresh air through installation of an energy efficient heat-exchange system (Takaro, Krieger, Song, Sharify, & Beaudet, 2011). These additional measures added \$5000-\$7000 in construction cost per home.

Takaro et al., (2011) and his team conducted a quasi-experimental study that assessed asthma symptom days, urgent health care visits, care-take quality of life, and exposure to indoor asthma triggers among children with asthma and compared these outcomes against a matched historical group. The difference between the two groups was occupancy in a BEH, otherwise both groups received the same supportive services by CHWs; baseline and post intervention data was

collected for both groups. To participate in the study the BEH group had to meet the following criteria: a child between the ages of 2 to 17 diagnosed with persistent asthma living in the home, family had to meet Housing Authority residency requirements, must be living in King County and have no prior violent criminal offenses. The BEH group consisted of a sample of 34 and the match group consisted of a sample size of 68.

The study found, after 1 year of residency in a BEH, that primary outcomes such as children's asthma-symptom-free days, urgent clinical visits, and caretaker quality of life had improved significantly (Takaro, Krieger, Song, Sharify, & Beaudet, 2011). Secondary outcomes such as the proportion of those with well-controlled asthma increased, while decreases in the use of rescue medications, symptom nights, asthma attacks and activity limitations (Takaro, Krieger, Song, Sharify, & Beaudet, 2011). Analysis conducted to compare the BEH group with the match group showed no significant differences in primary outcomes with the exception of nighttime symptoms. However, improvements in primary and secondary measurements were greater among the BEH group with the exception of lung function. Exposure to asthma triggers showed a significant reduction in BEH homes. Although the compared data was only statistically significant for nighttime symptoms the overall improvements from baseline for those living in BEHs suggest living in a BEH home provided benefits beyond just education alone (Takaro, Krieger, Song, Sharify, & Beaudet, 2011).

Systematic reviews of housing intervention studies indicate that a holistic approach to address housing deficiencies can improve asthma morbidity (Atherly, 2011; Crocker, et al., 2011; Krieger, et al., 2010); particularly in children and adolescents while the effectiveness in adults is inconclusive due to limited studies (Crocker, et al., 2011). The literature indicates sufficient evidence that multicomponent strategies improve asthma health which may include multifaceted

and tailored interventions that included cockroach control through the use of integrated pest management techniques, and elimination of sources of moisture, such as, leaks and addressing moldy areas (Krieger, et al., 2010). A review of multicomponent interventions to reduce asthma morbidity indicate a cost benefit ratio of 5.3-14.0 and a cost-effectiveness ratio of \$12- \$57 per asthma symptom free day (Nurmagambetov, et al., 2011)

Housing Tenure

The literature has substantiated that housing tenure is associated with mortality and morbidity (Ellaway & Macintyre, 1998; Macintyre, et al., 2003). Ellaway & Macintyre (1998) researchers in the United Kingdom (UK) compared chronic illness and death rates between those who owned their homes and those who rented using the Office of Population Census and Surveys (OPCS). The study attempted to identify whether housing tenure predicts health because it serves as an indicator for socio-economic status (SES) or because housing tenure actually exposes people to more health hazards.

Comparisons were made between two socially different areas of Glasgow City (UK); one which has better than average health, higher income, and greater access to services and the other which characteristically is of average health and considered more socially disadvantaged (comparisons made while also controlling for income, age, and sex). Several indicators were evaluated including housing stressors (e.g. related to overcrowding, dampness, other hazards), local area (e.g. amenities, crime, neighborliness, satisfaction), and chronic diseases (e.g. anxiety and depression).

The OPCS is a longitudinal survey collecting data at three age cohorts, 15, 35 and 55. In 1992 a total 691 persons who remained in the area were surveyed. Mortality rates among men were 26% higher and 21% higher in female renters compared to those who owned their home,

which was a similar trend identified in the previous 1981-1989 census (Ellaway & Macintyre, 1998). Those who lived in owner-occupied homes reported half as many long-term chronic health issues 10.1% to 19.7% respectively (Ellaway & Macintyre, 1998). Renters were 4 times more likely to report problems with dampness and condensation than their counterparts. It was found that housing stressors (e.g. presence of dampness/mold, ability to heat home in the winter, noise, privacy, and perceived hazards in the home) independently predicted chronic illnesses such as anxiety and depression. The area where someone lived and type of housing independently contributed to anxiety; while housing type, housing stressors, and neighborhood characteristics independently contributed to depression. The data suggest that housing tenure “may expose people to different levels of health hazards” (Ellaway & Macintyre, 1998).

Macintyre et al. (1998) conducted a longitudinal study in Central Clydeside Conurbation, a socially diverse area of Scotland, and compared housing tenure to a range of factors that include car access, general health, self-esteem, respiratory function, chronic diseases, and the number of symptoms reported in the last month. A total of 785 people in their late 30s and 718 people in their late 50s participated in the study. A bivariate model was used for analysis comparing various health measures to housing tenure and care access while controlling for income, age, sex and self-esteem. It was found that these health measures were significantly associated with housing tenure (Macintyre, Ellaway, Der, Ford, & Hunt, 1998). In summary, tenure, access to a car, income and self-esteem predict better mental health, respiratory function, hip/waist ratio, chronic illness and blood pressure. This suggests that housing tenure was more than a proxy indicator of housing and that housing tenure may have direct protective and damaging effects.

Macintyre et al. (2003) evaluated the relationship between dwelling conditions and neighborhood characteristics and their association with housing tenure and health. A survey sent

out to 6,500 adults living in a diverse area of Scotland that included responses from both ends of the economic strata; a response rate of 50% was achieved with a final sample size of 2,867 of which 61% were owner-occupied. The survey measured housing tenure; demographic variables such as age, sex, and marital status; and health related factors such as chronic illness, perceived general health, acute illness, and mental health. Other factors measured were housing conditions such as dampness or condensation, temperature, noise, and state of repair. Broader community level characteristics were also considered and included area amenities such as access to supermarkets, health care access, public transport, library, and pharmacy; lastly respondents were asked about neighborhood characteristics such as safety, vandalism, smells and fumes, assaults and muggings, burglaries, uneven or dangerous payments, discarded needles or syringes, nuisance from dogs, reputation of the neighborhood, poor public transport noise, and disturbances by children.

It was found that those in rental units were more likely to be exposed to health damaging features of the environment such as dampness, noise, crime and vandalism, and less likely to have access to health promoting features of the environment such as gardens and local amenities (Macintyre, et al., 2003). Data supports the model that those on the upper end of the social gradient are more likely to own their homes, live in housing conditions that promote health, and live in more desirable areas with fewer problems, which lead to better mental and physical health (Macintyre, et al., 2003).

Housing tenure may have psychosocial impacts on health; the ability to owning our own home provides a greater sense of security than renting, and is often used as an indicator of socio-economic status. The relationship between housing tenure and health is explained by conditions in which one lives and the neighborhood makeup (Gibson, et al., 2011).

Public Policy and Housing

One of the first housing policies established in the United States was the Housing Act of 1949 which aimed to provide decent housing and suitable living environments for all Americans (Shlay, 1995). Although it aimed to provide decent and suitable housing it fell short of reaching that goal. Partly because the terms “decent” and “suitable” were not operationally defined in order to establish measurable goals. In the simplest terms decent housing referred to the condition of structural components. Today, housing codes such as the International Property Maintenance Codes are adopted and modified by local jurisdictions. If adopted in a jurisdiction, they initiate a minimum standard for housing. By the mid-1970s this included: adequate plumbing, ventilation, light, space, absence of faulty wiring and malfunctioning heating units (Shlay, 1995).

Today, housing policy makers and public health officials aim to identify housing within the context of a healthy home. The National Center for Healthy Housing, which has been at the forefront of efforts to meet national goals to improve housing in the United States defines healthy housing as one that is “sited, designed, built, renovated and maintained in ways that support the health of residents (Galson, 2009).” Although the definition in itself appears broad; it encompasses the holistic approach in which housing can influence health. It entails the structural and safety aspects of the home, water and indoor air quality, exposure to chemicals, resident behavior, and the neighborhood the house is located in (Galson, 2009).

Health Impact Assessment

Health Impact Assessments (HIA) have been widely used in the UK and other parts of the world. Recently, they have also been used in the United States as a tool to better inform the decision making process related to policies, programs, plans and projects that could impact health, most often prior to decision or implementation (Birley, 2011). The World Health Organization defines

an HIA “as a combination of procedures, methods and tools that systematically judges the potential, and sometimes unintended, effects of a policy, plan, program or project on the health of a population and the distribution of those effects within the population. HIA identifies appropriate actions to manage those effects” (WHO, 1999). HIAs value the inclusion of democracy, equity, sustainable development, ethical use of evidence and comprehensive approach to health during implementation (HIP, 2014).

An HIA is different than other evaluation tools, such as, Environmental Impact Assessment (EIA), Health Risk Assessment (HRA), and Community Health Assessments (CHA) (Figure 4). An EIA was established by the National Environmental Policy Act (NEPA) of 1969 with the purpose of considering environmental impacts during the planning and decision making process (Canter, 1999). This grew out of the need to develop a checks and balances system which could mitigate or lessen environmental damage (Kemmer, Parry, & Palmer, 2004). The NEPA process includes a detailed environmental analysis to determine if proposed activities will result in an environmental impact. If an environmental impact is identified, an Environmental Impact Statement (EIS) is written. This document is used to summarize the need for the proposed activity, outline alternatives and a list of persons and agencies to engage. The EIS is used to assist public officials in making an informed decision. It includes a discussion of the purpose and need for the action, the impacts of the proposed action, and any adverse environmental impacts that are unavoidable. An EIA aims to make the environment an intricate part of the decision-making process (Randall & Jowett, 2010).

A Health Risk Assessment (HRA) is used to describe the extent and degree of health risks associated with exposures to environmental contaminants (CDC, 2012). HRAs are often used by occupational health and safety specialist within large organizations (Birley, 2011). A

questionnaire is used to evaluate the current health and quality of life; the data is then used to identify behavior choices that may impact health.

Figure 4. Comparison of evaluation tools

Health Impact Assessment	Environmental Impact Assessment	Community Health Assessment	Health Risk Assessment
<ul style="list-style-type: none"> Analyze social determinants that impact health Assess interventions identified to meet community needs Consider beneficial and harmful impact on health 	<ul style="list-style-type: none"> Legally required in some states & at the federal level National Environmental Policy Act (NEPA): legal mandate Assess downstream impacts such as noise, water, air at a system level Generate an Environmental Impact Assessment Health analysis is limited 	<ul style="list-style-type: none"> Ongoing process to identify gaps in the community Gather statistics on health status and data on community health needs/gaps/problems and assets Recommend policies and programs that will benefit the community 	<ul style="list-style-type: none"> Identify harmful impacts Quantitative analytic method to describe the nature and magnitude of health risks associated with exposures to chemical contaminants and other environmental substances and processes Not comprehensive

Source: (HIP, 2014)

A Community Health Assessment (CHA), also known as a community health needs assessment, aims to identify and understand the health needs of the community by identifying strengths and areas of improvement within a given jurisdiction. A CHA accomplishes this by systematically collecting data and analyzing the current health status, needs and issues of a given community. Data can be utilized to provide baseline decision making, mobilize communities, and garner resources. In its guiding document it prioritizes these needs and defines ways to create healthier environments while considering available resources (CDC, 2012).

What sets apart an HIA from other forms of evaluation is the consideration of health, social determinants and social justice (Bhatia, 2011; Quigley, et al., 2006). Planning with an HIA can also lead to the mitigation of unintended health consequences that may disproportionately burden

already marginalized and disadvantaged communities. The net outcome resulting in increased health burden and increased health care cost (Quigley, et al., 2006). An HIA is a multifaceted approach that engages decision makers and implements an unbiased approach to identify inequalities. It brings to the forefront the importance of health and makes health a policy priority. Lastly it can be implemented across sectors to include institutions beyond the health care field, such as, housing, transportation, education, agriculture to name a few (Birley, 2011). Quigley et. al (2006) identified eight key potential benefits of an HIA as outlined in Table 1.

Table 1. Potential benefits of an HIA
1. HIA involves and engages health experts, project proponents, other key players and the community affected by the proposal, and facilitates public participation in decision making.
2. HIA attempts to identify health inequalities that may arise from a proposal.
3. HIA addresses cross-cutting health issues with repercussions for sustainability.
4. HIA helps place public health on the agenda of many different agencies and individuals and increases awareness of what determines health status, thereby providing a basis for improved collaboration within and between agencies.
5. HIA provides a means to incorporate social and health responsibility into organizational activities and planning.
6. HIA is a tool for intersectoral action for health.
7. HIA focuses on the health status of vulnerable groups.
8. HIA may reduce the burden on health sector services.

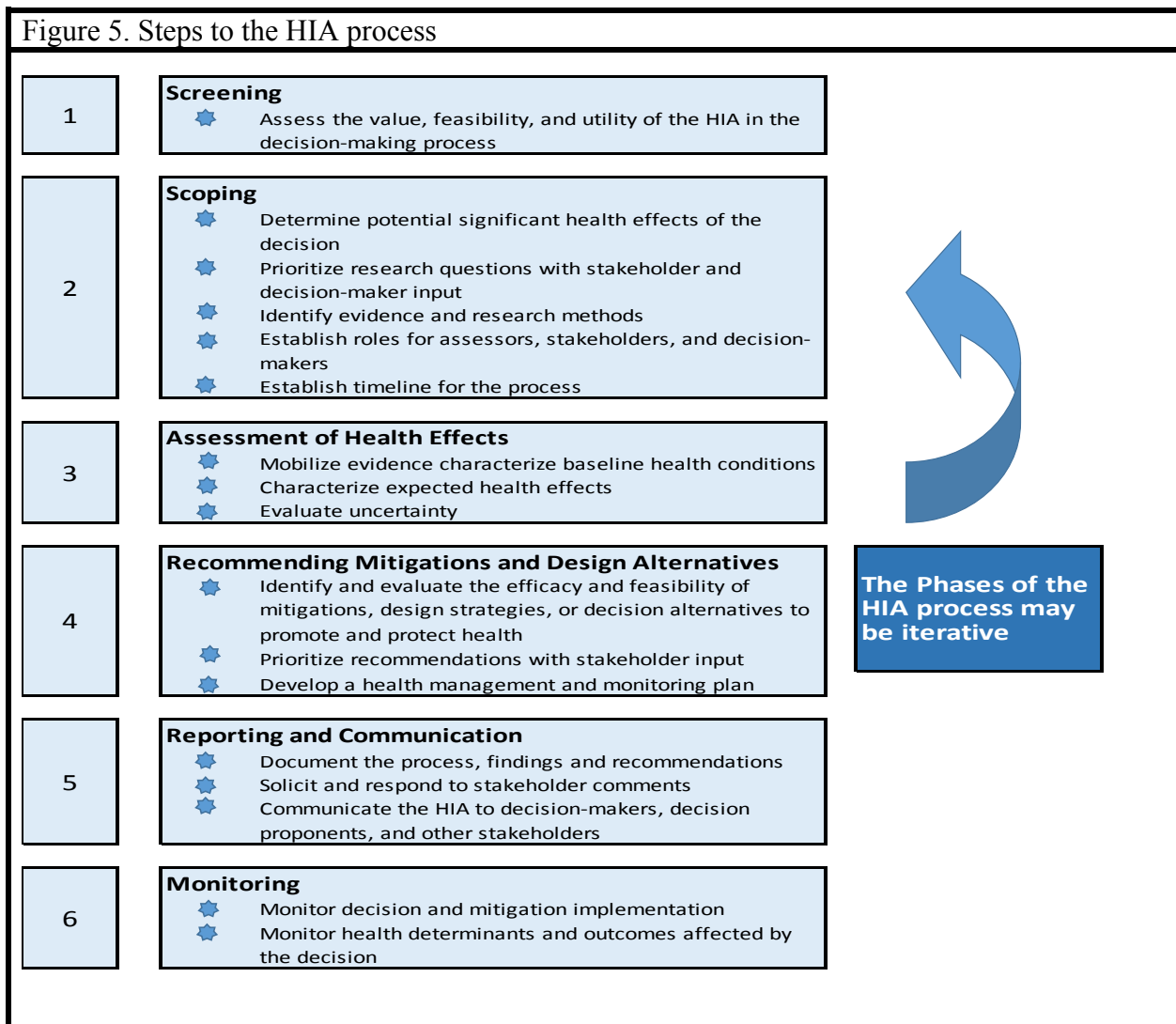
(Quigley, et al., 2006)

Approaches to HIA widely vary, Kemm (2000) and Cole and Fielding (2007) describe two different ways to classify HIAs. Kemm (2000) categorizes HIA's into two predominant categories: broad and tight (Kemm, 2000). Broad defined as an HIA that is holistic, sociological and qualitative; while a tight HIA is defined as epidemiological and quantitative. HIA approaches are gathered from different fields of expertise such as epidemiology, risk analysis, health promotion or environmental impact analysis (Cole & Fielding, 2007).

Cole and Fielding (2007) suggest that HIA approaches can be clustered into three different approaches: quantitative/analytic, procedure and participatory. Cole & Fielding (2007) describe quantitative/analytic approaches to HIA as an HIA that highly relies on existing data and aims to determine the range, direction and magnitude of potential health effects. This method requires the analysis of exposure, outcomes and a clear outline of the dose-response relationship. Of all the HIA methods it is the most time-consuming and costly, but provides the most concrete data; because the quantitative approach requires cause/effect and/or dose/response data for health indicators its usability is limited. The procedural approach is very similar to the quantitative/analytic approach and only differs because it's required by compliance or regulation.

The participatory approach comes from a community-based health promotion approach. Although all approaches include stakeholder participation, in the participatory approach it is the participants input that drives the reasoning for conducting an HIA and what is to be analyzed. The strength of this approach is that it engages public participation and a more democratic process in decision making. A significant limitation from less quantitative approaches is that they are seen as less concrete particularly in political systems that prefer the rigor of quantitative data. This approach also limits generalizability of the data (Cole & Fielding, 2007).

An HIA can be done prospectively while the proposal is being developed, before the proposal is implemented or can be done concurrently during implementation, or early in its operation. It can also be done retrospectively to identify how proposals have affected health or to modify implementation as needed (Birley, 2011). However, since unintended positive and negative impact can occur as result of proposed policies or decisions a prospective approach is recommended. An HIA is subdivided into six steps that build upon each other in developing a comprehensive look at a proposed policy and potential outcomes. These steps are screening, scoping, assessment of health effects, recommendations, reporting and monitoring (Figure 5).



(Bhatia, 2011)

HIAs are flexible tools that are driven by real-world constraints thus maybe scaled to adjust for funding, time, stakeholder input, data availability and/or interest

Step 1 Screening

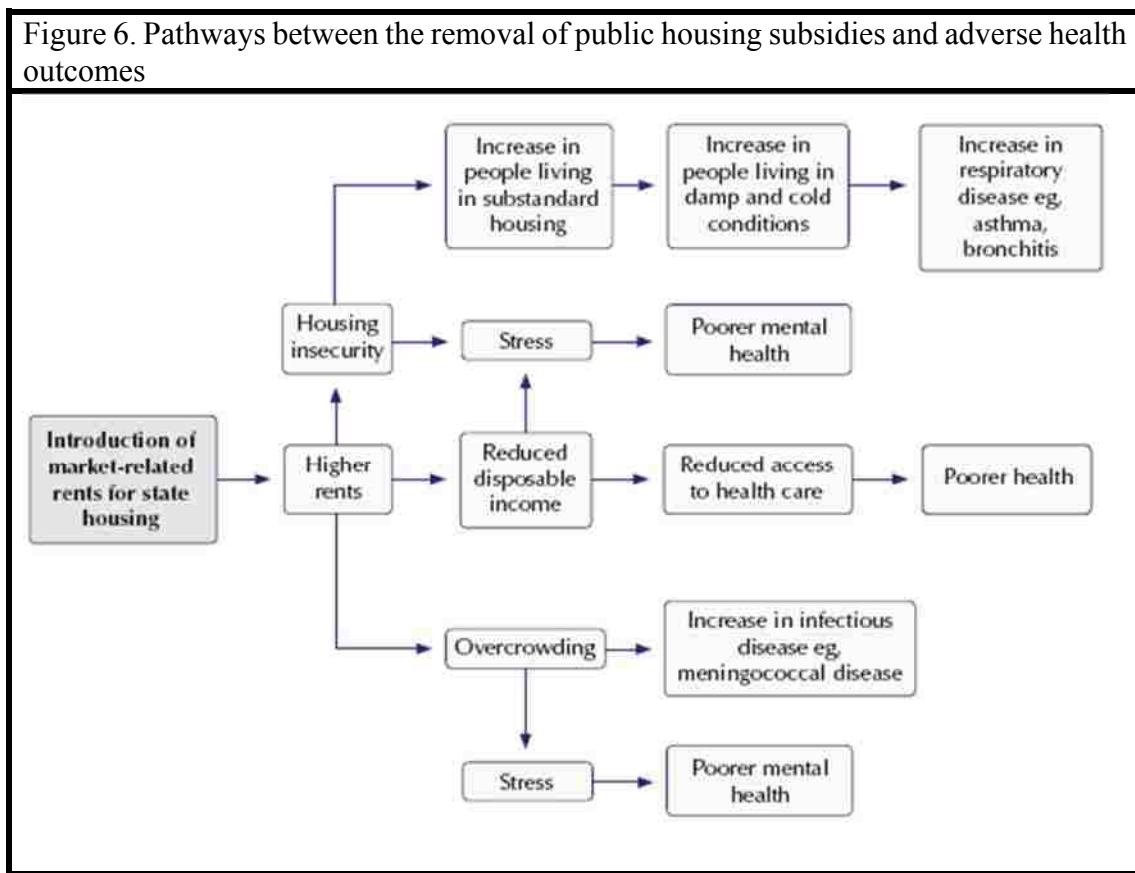
The first step in conducting an HIA is screening. Screening in an HIA starts with identifying a proposal or decision and determining if an HIA could be of value and is feasible within the scope of the decision-making process. All decision alternatives should be considered and clearly outlined (Bhatia, Farhang, & Lee, 2010). The screening phase should consider if findings from the HIA could have “significant effects on population health, particularly effects that may be avoidable, unequally distributed, involuntary, adverse, irreversible or catastrophic” (Bhatia, 2011; National Research Council (US) Committee on Health Impact Assessment, 2011). In addition, it must be determined if identified health effects are of concern or controversial among stakeholders, decision-makers and community members. Data limitations should also be considered as well as technical expertise needed and availability of financial resources to properly conduct an HIA. In order for the screening phase to be most effective, decision-makers and stakeholders need to be an intricate part of the HIA process. The screening phase should clearly establish the rationale for the HIA and its objectives (National Research Council (US) Committee on Health Impact Assessment, 2011).

Step 2 Scoping

The scoping stage should outline potential pathways that link the decision and/or policy to direct, indirect or cumulative impacts on health (Bhatia, Farhang, & Lee, 2010). Often casual models or logic models are developed to identify interactions between policy decisions and health outcomes. Frameworks based on scientific evidence, literature reviews and expertise should be built to identify all possible and plausible health outcomes. Bhatia (2011) demonstrates (Figure

6.) the possible causal pathways that may result from a policy proposal that would remove public subsidies for publicly owned housing. In this example an increase in rent and housing insecurity are considered indirect effects that may result in poor health; whether we are considering overcrowding, housing insecurity, higher levels of stress or living in substandard housing.

Causal or logic models attempt to depict the complicated and interweaving interactions between biology, environment, social and cultural factors that can all influence health. These models are a simplified version of a complex system. Their utility however in the decision making process is essential. They allow stakeholders and decision-makers alike to develop a collective understanding of all the plausible outcomes to a particular decision. Further, they allow for the prioritization and analysis of issues that are of greatest concern (Bhatia, 2011).



(Bhatia, 2011)

It is also important to consider how and if health determinants (Table 2) may be affected by the policy proposal (Bhatia, Farhang, & Lee, 2010; National Research Council (US) Committee on Health Impact Assessment, 2011). During the scoping phase stakeholders and community members play an integral role in the identification of health determinants to be considered.

Table 2. Determinants of health to be considered during an HIA

Domain	Health Determinant
Behavioral risk factors	Diet Physical activity / inactivity Smoking Alcohol Consumption Drug addiction Leisure and recreational activity
Employment and Livelihood	Employment and job security Income and employment benefits Workplace occupational hazards Workplace rewards and control
Family and Community Structure	Social support / isolation Family structure and relationships Voluntary group participation Arts and culture Faith, spirituality and tradition Crime and violence
Housing	Housing supply, cost, and accessibility \ Housing size & level of crowding Housing safety? Neighborhood infrastructure and livability Residential segregation
Environmental Quality	Air quality Soil contamination Noise Disease vectors Natural spaces and habitats Floods, wildfire, and landslide hazards Transportation hazards Food resources and safety Water resources and safety
Public Services	Educational access or quality Health care access or quality Transportation Parks and recreational centers Waste systems Police / security and emergency response
Private Services	Financial institutions Retail food resources Child care services
Political Factors	Inequality Social exclusion Discrimination Political participation Freedoms of speech and press

(Bhatia, 2011)

The scoping stage also delineates the roles and responsibilities of stakeholders and decision-makers. Bhatia (2011) further outlines the following as essential components that should be defined during the scoping phase:

- Who will conduct the analysis?
- What timeframe is given to conduct the assessment phase?
- Which specific decision alternatives will be evaluated?
- Which potential health impacts will be analyzed?
- What are the geographical and temporal boundaries for impact analysis?
- Which vulnerable populations are affected?
- What data, methods, and analytic tools will be employed?
- How will the HIA characterize health effects?
- Which experts and key informants will be engaged?
- What is the plan for stakeholder engagement and public review of the HIA?
- How will the HIA be communicated and reported? By whom?

The final scope should clearly define the outcomes of greatest impact and inequities of those impacts. It should also outline available data sources and research methods to be employed.

Step 3 Assessment of Health Effects

The assessment step in an HIA builds upon work done during the scoping stage; it is used to characterize the potential health effects of a proposed policy or decision (Bhatia, 2011). Three specific outcomes result from the assessment. The first outcome determines baseline conditions of the affected population; this includes the health status of a population, vulnerabilities to health effects and health determinants. It also outlines the possible health effects of alternative decisions.

Lastly the assessment phase evaluates the level of confidence or certainty in the health effects. Main outcomes are accomplished from five different tasks conducted in the HIA process.

Task 1 of the assessment phase uses empirical research to provide evidence to support inferences identified during scoping (Bhatia, 2011). This requires an extensive and systematic review of the literature. Inclusion criteria of types of studies and topics should be identified, as well as, categorized by study quality, study power, biases and methods; as these characteristics will be influential in determining the likelihood of characterized health effects. Although HIAs focus on quantitative studies and data, qualitative research can provide a great deal of information. Qualitative data can identify hypotheses, prioritize issues, understand local conditions, perceptions and vulnerabilities (Bhatia, 2011).

Task 2 of assessment gathers baseline conditions of the affected population. Baseline conditions can be evaluated using census data along with other data sources that include variables such as, life expectancy, housing conditions, hospitalization, prevalence and injury rates and measures health. Likewise, determinants of health should be characterized. This can include behaviors such as smoking and physical activity. As well as environmental exposures, community conditions, health resources, income and social networks (Bhatia, 2011; National Research Council (US) Committee on Health Impact Assessment, 2011). Gaining a comprehensive understanding of the health and social determinants that affect the community will aid in understanding factors related to resilience and vulnerabilities. Bhatia (2011) specifies that communities with higher a prevalence of chronic diseases maybe more vulnerable to health effects. On the other hand, communities that have strong social and community networks may provide a buffer to health effects. When profiling baseline conditions, spatial and demographic variations of health outcomes and vulnerabilities should be considered. Variations may be a result of changes

in place, demographic characteristics such as age, gender, race, health care access, adverse health conditions, and may identify neighborhood differences.

Task 3 includes establishing quantitative estimates or forecasting, which adds precision to evaluating health effects (Bhatia, 2011). It is worth noting that quantitative estimates require a great deal of information, which includes changes in distribution of health determinants, frequency of health indicators at baseline and exposure-response relationships (Bhatia, 2011). Human health risk assessment (HRA) is a quantitative method of forecasting human health risk from environmental exposures, often using quantitative models. Estimates are often derived from exposure response relationship provided by experimental or human epidemiological studies. Forecasting provides much value to the HIA process, however, exposure-response relationship only exists for a small number of health determinants and health outcomes. When HRA modeling is not feasible, epidemiological studies or meta-analysis can be conducted. Meta-analysis may be used to identify patterns among study results (Bhatia, 2011).

Prospective analysis of data is not the only method employed in HIA's processes. Retrospective data that connects determinants or risk factor and a health outcome can provide valuable data. Bhatia (2011) provides the example of an HIA conducted in West Oakland Port expansion. The HIA evaluated truck collisions and truck-pedestrian collision injuries and fatalities within three different geographical areas and found that truck pedestrian collisions in West Oakland were ten times more frequent than in the rest of the Alameda County. In this instance retrospective data allowed to determine areas of higher risk for truck pedestrian collisions.

Task 4 characterizes the likelihood, severity, magnitude and distribution of health effects (Table 3). This is done after the data has been gathered and analyzed. No standard exists on how health effects should be characterized nor is it testable (Bhatia, 2011).

Table 3. Health effect characteristics and their interpretation

Likelihood	How certain is it that the decision will effect health determinants or outcomes irrespective of the frequency, severity, or magnitude
Unlikely/ Implausible	Logically implausible effect; substantial evidence against mechanism of effect
Possible	Logically plausible effect with limited or uncertain supporting evidence
Likely	Logically plausible effect with substantial and consistent supporting evidence and substantial uncertainties
Very Likely / Certain	Adequate evidence for a causal and generalizable effect
Insufficient Evidence / Not Evaluated	—
Severity	How important is the effect with regards to human function, well being, or longevity, considering the affected community's current ability to manage the health effects
Low	Acute, short term effects with limited and reversible effects on function, wellbeing, or livelihood that are tolerable or entirely manageable within the capacity of the community health system.
Medium	Acute, chronic, or permanent effects that substantially affect function, well-being, or livelihood but are largely manageable within the capacity of the community health system; OR Acute, short-term effects on function, well-being, or livelihood that are not manageable within the capacity of the community health system
High	Acute, chronic, or permanent effects that are potentially disabling or lifethreatening, regardless of community health system manageability; OR Effects that impair the development of children or harm future generations.
Insufficient Evidence / Not Evaluated	—
Magnitude	How much will health outcomes change as a result of the decision (i.e., what is the expected change in the population frequency of the symptoms, disease, illness, injury, disability, or mortality).
Limited	A change of less than 1/10th of one percent in the population frequency of a health endpoint
Moderate	A change of between 1/10th to one percent in the population frequency of a health endpoint
Substantial	A change of greater than one percent in the population frequency of a health endpoint
Insufficient Evidence / Not Evaluated	—
Distribution	Will the effects, whether adverse or beneficial, be distributed equitably across populations. Will the decision reverse or undo baseline or historical inequities.
Disproportionate harms	The decision will result in disproportionate adverse effects to populations defined by demographics, culture, or geography
Disproportionate benefits	The decision will result in disproportionate beneficial effects to populations defined by demographics, culture, or geography
Restorative equity effects	The decision will reverse or undo existing or historical inequitable health-relevant conditions or health disparities
Insufficient Evidence / Not Evaluated	—

(Bhatia, 2011)

Veerman, Mackenbach & Barendregt (2007) and Petticrew et al. (2007) agree that the validity of characterization lies on the researchers judgments based on the scientific data, plausibility, logical reasoning, knowledge, data limitation and uncertainties (Petticrew, Cummins, Sparks, & Findlay, 2007; Veerman, Mackenbach, & Barendregt, 2007).

After a review of the literature and analysis of the data the likelihood, severity, magnitude and distribution of each health outcome is determined. The likelihood of an effect represents the degree of certainty that it will occur (Bhatia, 2011). A high likelihood typically results from cause and effect relationships. The severity of a health effect is an indication of its importance and intensity; for example it attempts to triage between a slight injury and disabling or life-threatening injury (Bhatia, 2011). The magnitude attempts to measure how much the resulting action will impact health outcomes. The magnitude may include the expected changes in the “frequency of symptoms, disease, illness, injury, disability or reduced life-expectancy” or even changes in the population (Bhatia, 2011). Furthermore, magnitude typically estimates the function of several factors including population size, “baseline frequency of disease, injury, illness or mortality in the population, change in health risk or resilience factors and strength of association between an affected health risk factor and health outcome” (Bhatia, 2011). Finally, the distribution examines if the effects are equally distributed across populations. One of the most challenging parts of characterizing health effects is achieving consensus among research teams, stakeholders and decision-makers (Bhatia, 2011). The key component is to derive evidence based consensus on each health outcome.

Analyzing and characterizing inequitable impacts are an important part of the assessment step. As an intricate objective of the HIA process it should describe how decisions may generate, perpetuate or prevent health inequalities (Bhatia, 2011). Thus it must be considered if the policy

will affect communities who are vulnerable to health inequities. Further it should examine if policy changes will increase risk factors such as environmental exposures that already exist. The magnitude of change should also be evaluated. Will policy changes result in greater health effects in certain communities than in the general population?

Task 5 assesses the level of confidence in how health effects are characterized. Thus it is important to consider gaps in the literature; what is the available evidence, what are the assumptions and how can assumptions impact how health effects are characterized. Bhatia (2011) describes that uncertainties in baseline conditions like frequency of health conditions, distribution of exposure or the relationship between exposure and disease contribute to generating uncertainty in health estimates.

Step 4 Recommending Mitigations and Design Alternatives

A key objective to an HIA is to evaluate the policy proposal and determine the plausibility of health outcomes (Bhatia, 2011). After review of the collected data and/or literature reviews it is possible that design alternatives or ways to mitigate health outcomes be recommended. Alternatives should be based on the health effects considered in the HIA and should be prioritized based on health benefits, costs and feasibility. Furthermore, recommendations or design alternatives should be specific and actionable. It is also plausible that the HIA make no changes to the policy proposal because it is not always appropriate, thus leaving the policy or program unchanged.

Step 5 Reporting and Communication

Reporting and communication are an integral part of an HIA. An HIA attempts to integrate multiple decision makers and stakeholders in a transparent process. An HIA report should be comprehensive and document the HIA process; issues analyzed; available data; baseline

conditions; analytic methods; results and alternatives if recommended (Bhatia, 2011). Other forms of communication can be written for specific target audiences such as executive summaries, facts sheets, press releases, community workshops, distribution of material door-to-door, radio, TV, interviews, or website (Bhatia, 2011; National Research Council (US) Committee on Health Impact Assessment, 2011). Further, HIA can aid in providing testimony at public hearings or legislative briefings.

Step 6 Monitoring and Evaluation

Monitoring occurs after a decision is made. It oversees how implementation of the decision is made and attempts measure health outcomes over the long term. It also can prospectively monitor health determinants and health outcomes. Outcome monitoring functions in two critical ways: identifying unexpected health consequences and monitoring changes in health and health determinants. Most often resources available to conduct an HIA do not account for long term monitoring. However, the final HIA report can provide recommendations for monitoring.

HIA evaluation can be broken down into three key components process, impact and outcome. Process evaluation includes an analysis of the actual HIA process. It helps identify lessons learned and ways to improve the HIA practice. It takes into consideration timing, population, place, and available resources. Impact evaluation determines the impact of the HIA on the decision making process which includes identifying its usefulness in the decision making process and if it leads to changes in policy design. The outcome evaluation evaluates whether identified health indicators were of relevance. It also considers if changes in health indicators was as predicted and if other health indicators needed to be evaluated.

Health Impact Assessments have been widely used internationally and have gained momentum in the United States over the last 10 years. They have been used to assess policies and programs focused on transportation, air and water quality, noise, education, employment, parks and recreation and many other topic areas. Despite its growing use in other realms only a few have a housing focus and none have focused on rental housing policies specifically. The few most relevant HIAs to housing and housing tenure are summarized below.

As part of a broader HIA Ohio State University published an HIA on the proposed reduction of physical inspections by the Ohio Housing Finance Agency (OHFA). The OHFA intended to implement a reduction in physical inspections in order to reduce cost and reduce the number of appointments renters were subjected to by various agencies. The HIA aimed to evaluate the impact of reducing the frequency of inspections across three agencies OHFA, Housing and Urban Development (HUD) and Rural Development (RD). A retrospective cross-sectional study was conducted on inspections conducted by the three agencies. Inspection reports from affordable housing properties from 2007 to 2011 were evaluated and coded to fit specific violation categories. The study found that 85% of inspections identified at least one housing deficiency that could impact health (Klein, Keller, Hood, & Holtzen, 2014). The most common deficiencies found included plumbing problems and appliance concerns. It also found difference in how inspections were conducted across different agencies. The HIA concluded that a reduction of housing inspections could put tenants at higher risk for health problems. However, the HIA noted that if the frequency of inspections was reduced it should do so strategically and maintain inspection among bigger and older properties. The final recommendation identified the need for consistent evaluation of housing deficiencies across agencies.

The Public Housing Authority in San Francisco (SFHA) focuses on providing access to affordable housing to low income families, the elderly, and persons with disabilities in order to improve the health of San Francisco residents. Much of this work has been done with Federal HOPE VI funding, a federal Housing and Urban Development initiative introduced in 1993 to “address a large inventory of severely distressed public housing units in the U.S” (Seto, et al., 2009). Since most HOPE VI funding is no longer available, HOPE SF is part of an innovative campaign of public and private dollars to continue efforts to improve and revitalize public housing in San Francisco (Seto, et al., 2009). The funding will go towards redeveloping other distressed public housing sites, increasing affordable housing and ownership opportunities, and improving the health of existing public housing residents.

The HIA conducted on the HOPE SF project aimed to identify both positive and negative impacts of past HOPE VI redevelopment sites, to understand the current health needs, and to identify opportunities to improve the implementation of HOPE SF redevelopment. Staff reviewed the literature, mapped neighborhood-level data for two housing sites and conducted surveys and qualitative interviews housing site management, key players in the redevelopment process and housing residents. Researchers evaluated a series of factors that included current housing conditions; resident health; displacement; social cohesion; crime and safety, and healthy eating and active living. Participants were asked about their satisfaction with their current housing: space/privacy, physical maintenance, and affordability, relationship with landlord, safety, cleanliness, and convenience. They also provided self-reported health status, rated their overall health and access to health care.

Seto et al., (2009) found that redevelopment under HOPE VI improved housing conditions, exposures to environmental hazards and overall satisfaction with living (Seto, et al., 2009).

Quantitative and qualitative data revealed that despite improvements, challenges to housing maintenance remain. The data also indicated among those surveyed, high rates of asthma and other chronic health conditions such as obesity and stress. In addition to an increase in cardiovascular risk factors, such as high cholesterol and high blood pressure (Seto, et al., 2009).

White and McGrath, 2012, conducted an HIA on a rental housing inspection program in Portland, Oregon. Portland has two different types of inspection models: the standard model which is complaint based and the enhanced model which is also complaint based but allows for the inspection of additional units if a certain threshold of violations (interior and exterior of property) is met by the same landlord (White & McGrath, 2012). The enhanced model was developed to address barriers to reporting housing problems such as fear of retaliation, language barriers, and lack of education/awareness to rights regarding housing conditions and was implemented in communities where renters were spending more than 30% of income on housing (White & McGrath, 2012).

The HIA was conducted in order to inform current and future funding decisions in regards to the inspection programs. It was designed to determine how renters could be impacted by changes to the inspections program and identify possible equity issues regarding who might benefit most from the proposed changes to the inspection program. Scenarios considered during the assessment phase include leaving the inspection program at status quo, discontinuing the enhanced model, and expanding the enhanced model (White & McGrath, 2012). The HIA evaluated health status, health equity impacts of both inspection models, number of cases, violations and units inspected, as well as, the average number of violations per case.

The HIA found a strong connection between housing, health and equity. Furthermore it found that the standard inspection model was not meeting community needs. Under the standard

model renters are hesitant to make complaints for fear of their rent being raised, being intimidated or evicted. Furthermore tenants indicated language as a barrier to making housing complaints. Complaints made under the enhanced model resulted in 75% more improvements than a complaint made under the standard model. This variation is due to the fact that units in the enhanced inspection areas had more violations per unit than the units in the standard districts (White & McGrath, 2012). However, the difference also is a result of additional units inspected under this model. Expanding the enhanced model to additional areas that have the highest rates of cost-burdened households would increase the number of rental units covered two-fold, thus improving health equity in Portland. Lastly, both models fell short in providing an education component to landlords and tenants.

The HIA recommended expanding the enhanced model strategically to other areas of Portland, particularly those with the highest rates of cost burdened households. The HIA further recommended the implementation of tenant/landlord education strategies in order to integrate improving housing conditions with changes in landlord/tenant behaviors. Educational focus for tenants include understanding how to reduce/eliminate the presence of mold, pests, allergens, irritants, and safety hazards, while landlords are educated on the importance of timely repairs and basic services and their connection to reducing health risk. Lastly, it was recommended to expand data tracking mechanisms to include health and housing indicators in order to determine most effective and least costly solutions.

Kosa, Molnar, Mckee and Adnay (2007) conducted an HIA on the eviction process of a Roma community from their housing. In Europe the Roma population is the largest ethnic minority and are at a disadvantage in terms of health and housing (Kosa, Molnar, Mckee, & Adany, 2007). The Hungarian local government filed a lawsuit to evict the community of squatters living in

government owned housing. The housing was once used as temporary dwellings for workers of a brick factory that no longer exists. No paved roads lead to the area and buildings are un-insulated, leaking and often damp. The homes provide no security since none of the doors lock. None of the houses have electricity or running water, sewage system; or garbage collection. A serious pest infestation of rodents and insects runs rampant.

The court ruled that the squatters should be evicted from their existing housing. The HIA was tasked with considering two different scenarios: one, remove the squatters from their housing and place families on a waitlist for social housing of which there were no guarantees. This option would result in considerable displacement of the community and would call for children to be taken into care while parents were homeless. The second scenario would be to create new housing on the same site or elsewhere in order to maintain cohesion of the community.

Researchers collected both qualitative and quantitative data through visits with community members, workshops, focus groups and semi-structured interviews with community members and professionals. Quantitative data included demographics like education, employment, income, health behavior and status. Qualitative data was collected via in-depth interviews, community meetings, focus groups, observations, and thought experiments.

The HIA reached a consensus that is consistent with current research that improving housing can result in health improvements; while acknowledging that quantifying the magnitude of the improvement is uncertain. Scenario one, evicting the families from the dwellings they were living in without any alternative accommodations offered no health benefits. Furthermore the HIA determined that the eviction process would further place the Roma community at a greater disadvantage. On the other hand, the second scenario would provide adequate alternatives that

would retain community cohesion and over time improve housing conditions, nutrition, prevalence of chronic diseases, and overall mental health.

Elliott and Williams conducted an HIA on a housing re-development project in Llangeinor located in an isolated area outside of Wales. Llangeinor was once a coal mining community but after much de-industrialization of the area it has declined economically, socially, and culturally (Elliott & Williams, 2002). Llangeinor is considered one of the top 100 deprived wards of 865 in Wales and one of the four most deprived wards in Bridgend County Borough. The City Council is interested in redeveloping the area but doing so with consideration of health in the process. The goals of the HIA were to gather baseline demographics of Llangeinor, to determine potential impacts on health, based on evidence in the literature, and to determine the local perspective on health, well-being and housing in Llangeinor. Baseline data of Llangeinor population of 1,500 indicated higher single parent households, more children per household, unemployment, car theft crimes, mortality rates, chronic illness and respiratory disease in comparison to the Bridgend area.

The HIA explored the potential impacts of health from the physical environment, lifestyle, social environment, and various public services (Elliott & Williams, 2002). It is clear that the connection between poor housing, poverty and health is a complicated one and a result of a complex range of factors that are social and economical in nature. Elliott and Williams (2002) found that the overall redevelopment of the Llangeinor area would provide a positive impact on health. Redevelopment would allow for the construction of better quality housing, energy efficiency and housing design to improve safety and long-term viability for at risk populations such as seniors. The research supports that improvements in housing can result in improvements on physical and mental health. However, authors suggest that gains are minimal if broader social determinants of health aren't concurrently addressed. Further, the impacts of relocation or

permanent displacement as an important factor to consider in the redevelopment process. Therefore, redevelopment will need to consider how it will maintain social cohesion and extended family networks in an already tight knit community.

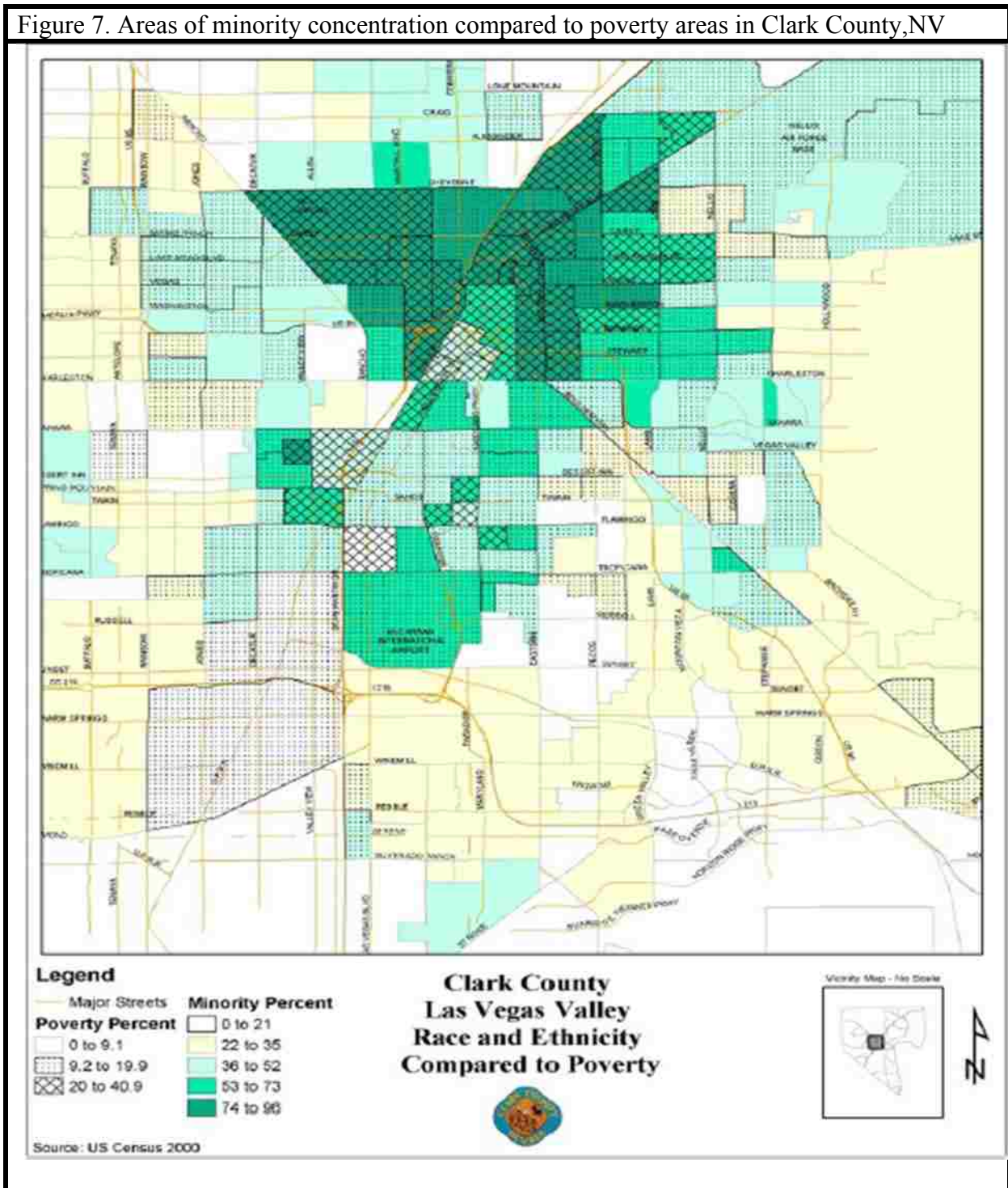
Since the last literature review in January of 2015 there has been no completed HIA that evaluate rental housing policies. Traditional literature searches were conducted using Academic Press and Google Scholar for peer reviewed articles using the following key words: health impact assessment, housing interventions, housing policy, housing tenure, housing remediation, asthma interventions, and housing disparities. Additionally, similar searches were conducted on websites such as Health Impact Partners and San Francisco Department of Public Health whom lead many HIA efforts. The proposed HIA will evaluate the proposed Clark County Rental Housing Policy (Appendix 1) which aims to identify vulnerable populations that may be disproportionately affected by Rental Housing Policy, to evaluate housing resolutions and to make recommendations and design alternatives before implementation of rental housing policy.

Profile of Clark County, Nevada

Based on 2013 one-year census estimates Nevada population has almost 2.8 million residents with the majority of residents located with two counties; Washoe with approximately 433 thousand residents and Clark County with over two million residents. The rest of the state is made up of rural and frontier lands. Clark County is located in the most southern tip of Nevada and is made up of ethnically diverse residents of which 46% are white, 30% are Hispanic/Latino and 11.5% are Black/African American. Twenty-four percent of our residents are under the age of 18 while almost 13% make up persons over the age of 65. According to the Las Vegas 2010-2014 Consolidated Plan minority groups in Las Vegas have lower income households compared to non-minority groups. Figure 7. depicts the concentration of poverty and minority groups across the

Valley.

Figure 7. Areas of minority concentration compared to poverty areas in Clark County, NV



(HUD, 2010)

Housing in Clark County, NV

Clark County has a total of 854,128 housing units located within jurisdictional boundaries of Las Vegas, North Las Vegas, Unincorporated Clark County, Henderson, Boulder City and Mesquite; of which 51.9% are owner-occupied and 48.1% are renter-occupied (Census, 2013). Clark County was subjected to one of the worst housing crises in the United States. It experienced a rapid growth in population and housing construction over the last twenty years. Housing prices escalated so rapidly that many were left without the ability to afford homes and then as the county experienced a decline many were left with unaffordable mortgages and/or the lack of equity in their homes (Coughenour, Pharr, & Gerstenberger, 2014). Affordability of housing plays an essential role in housing choice, location, and condition. According to the Clark County Consolidated Plan housing affordability remains an area of concern for our extremely low and low income renters who are subjected to severe cost burden of housing. Those in Clark County who are of extreme to low income, lack the income to rent a Studio apartment at the average market rate (HUD, 2010). Average cost for a studio rental in Clark County is \$580 which would only be affordable to a family of 6 who is 30% of poverty (extremely low income) (HUD, 2010). The 2009-2013 five year Census estimates indicate over 160 thousands families living below poverty in Clark County.

Despite the number of new construction in the valley low-income households are living in substandard housing; particularly among those who are renting (HUD, 2010). According to 2013 one-year estimates of the U.S. Census Clark County, Nevada with 854 thousands housing units has 28,543 occupied housing units with a complete lack of plumbing and 42,814 units with a complete lack of kitchen (Census, 2013). According to the State of the Cities Data System renters of all household types experience a great degree of housing problems compared to owner-occupied

units in Clark County (SOCDS, 2000). Housing problems are defined as: a cost burden greater than 30% of income; and/or overcrowding; and/or lack of complete kitchen or plumbing facilities.

However, more detailed analysis characterizes rental housing conditions in Clark County, Nevada. Sokolowsky (2014) conducted the first review of the Clark County landlord-tenant hotline (LTH) that focused on documenting the prevalence of deficiencies reported by renters in Clark County, NV from 2011-2013. A total of 3,523 complaints were documented. Prevalence data on housing deficiencies found that almost 50 percent of the complaints were for mold (24.1%) and general maintenance (23.1%); while bed bugs (12.6%), cockroaches (10.4%) and HVAC outages (7.7%) accounted for the next top three complaints (Table 4).

Table 4. Frequency of housing complaints by category in Clark County, NV from 2011-2013		
Complaint Category	Frequency	Percent of Total
Mold	849	24.1
General Maintenance	814	23.1
Bedbugs	445	12.6
Cockroaches	367	10.4
HVAC Outage	272	7.7
Other Insects	148	4.2
Malodor	139	3.9
Water Outage	137	3.9
Sewage	95	2.7
Electrical/Gas Outage	23	.7
Rodent	72	2.0
Domestic Animal	31	0.9
Pigeon	32	0.9
Other		
ETS	5	0.1
Non-ETS	85	2.4
Hoarder	9	0.3

(Sokolowsky, 2014)

Of the complaints reported into the CCLTH over 36% (n=1,293) were identified as potential asthma triggers (mold, cockroaches, rodent, and environmental tobacco smoke) (Sokolowsky, 2014).

The study also examined the distribution across geographic boundaries and the relationship between median income and frequency of reporting hazards. Data analysis indicated a higher number of housing complaints from the City of Las Vegas, compared to Unincorporated Las Vegas, Henderson and North Las Vegas (Sokolowsky, 2014). The relationship between median household income and adjusted number of complaints per ward boundaries was found to be statistically significant; indicating inverse relationship between low-income and rate of complaint. Census and local housing data collected reveal the burden housing amongst the low-income communities to be great and include issues of affordability, overcrowding, poor housing conditions and the presence of asthma triggers.

Available Asthma Data

As of 2012 the State of Nevada along with other community partners developed the Nevada Statewide Asthma Control Coalition whom began drafting Nevada's first Statewide Asthma Control Plan (NSACP). The NSACP focused on identifying asthma burden in Nevada and aimed to provide recommendations for asthma data collection and surveillance (NSACP, 2014). Nevada does not have one data repository for asthma surveillance. Currently asthma data is reported to various agencies which include the state agencies, universities and local health districts. The data sources include the Behavioral Risk Factor Surveillance System (BRFSS) surveys including the childhood asthma module and the adult asthma call-back survey, hospital discharge data, Youth Risk Behavior Survey conducted statewide, and local health district data (NSACP, 2014).

According to statewide data collected via the Nevada Youth Risk Behavior Survey completed in 2013 a quarter (n=865) of high-school students indicated they had asthma (YRBS, 2013). When broken down by demographic variables, such as race and ethnicity, higher rates of asthma are reported by American Indians (45.4%), Black/African Americans (30.2%), other/multiple races (31.1%), and lower among Asians (23.7%), Whites (24.25%) and Hispanic/Latinos (20.4%) (YRBS, 2013). Examining the same data by county, rural and frontier areas have higher rates of asthma, with some counties reporting as high as 30%. Comparing the two most populated areas of the state Clark County (25.3%) high school students report more asthma compared to Washoe County (17.8%) (YRBS, 2013).

Data from the 2013 and 2014 Nevada BRFSS as shown below (Table 5) indicates that 12.4% of Nevada children report lifetime asthma, 13.8% of which are located in Clark County and over 7% have a current asthma diagnosis of which 8.2% live in Clark County (BRFSS, 2014)

Table 5. Nevada children with current and lifetime asthma 2013-2014 BRFSS					
Demographic	Grouping	Child Lifetime Asthma		Child Current Asthma	
		N	Weighted % (95% Confidence Interval)	N	Weighted % (95% Confidence Interval)
Statewide	Nevada	1,958	12.4 (10.0-14.8)	1,953	7.3 (5.5-9.2)
County	Balance of State	625	9.0 (6.1-11.8)	623	4.9 (2.8-7.0)
	Clark County	629	13.8 (10.3-17.3)	628	8.2 (5.4-10.9)
	Washoe County	704	10.8 (7.9-13.7)	702	6.5 (4.1-8.9)
Age	0 - 4	435	6.9 (3.3-10.4)	435	5.6 (2.2-9.0)
	10 - 14	604	19.7 (14.0-25.4)	602	9.5 (5.8-13.3)
	15 - 17	453	9.9 (6.1-13.8)	451	5.5 (2.8-8.2)
	5 - 9	466	12.0 (7.6-16.4)	465	7.9 (3.9-11.9)
Sex	Male	994	12.7 (9.6-15.9)	990	7.4 (4.9-10.0)
	Female	941	12.4 (8.7-16.0)	940	7.4 (4.6-10.1)
Race/Ethnicity	Black	106	26.3 (14.4-38.2)	105	12.9 (4.1-21.6)
	Hispanic	522	11.7 (7.9-15.4)	522	6.4 (3.4-9.3)
	Other	142	10.8 (3.5-18.1)	142	6.5 (0.0-13.1)
	White	1,188	9.6 (7.5-11.8)	1,184	7.0 (5.1-9.0)

(BRFSS, 2014)

Statewide BRFSS data for adults with lifetime asthma indicate a prevalence of 12.4%. When broken up by county the data indicates that rural/frontier areas of the state have higher percentage of adults with lifetime asthma at 12.6%, followed by Clark County at 11.8%, then by Washoe County at 11.3%. Adults with current asthma in the state and across Clark, Washoe and other areas of the state are 7.8% to 8% (Table 6).

Table 6. Nevada adults with current and lifetime asthma 2013-2014 BRFSS					
Demographic	Grouping	Adult Lifetime Asthma		Adult Current Asthma	
		N	Weighted % (95% Confidence Interval)	N	Weighted % (95% Confidence Interval)
Statewide	Nevada	8,827	11.8 (10.7-12.9)	8,773	7.8 (6.9-8.7)
Region	Balance of State	2,947	12.6 (11.0-14.1)	2,922	7.8 (6.6-8.9)
	Clark County	2,917	11.8 (10.3-13.3)	2,906	7.8 (6.6-9.0)
	Washoe County	2,963	11.3 (9.9-12.7)	2,945	8.0 (6.8-9.1)
Age	18 - 24	531	15.1 (11.2-19.1)	526	8.0 (5.0-11.0)
	25 - 34	948	11.5 (8.3-14.7)	942	7.5 (5.1-9.8)
	35 - 44	1,118	9.8 (7.5-12.1)	1,112	5.4 (3.8-7.0)
	45 - 54	1,498	12.5 (9.6-15.3)	1,487	9.2 (6.6-11.8)
	55 - 64	1,846	13.0 (10.5-15.6)	1,837	9.5 (7.3-11.7)
	65+	2,886	10.3 (8.7-11.9)	2,869	7.5 (6.1-8.9)
Sex	Female	5,033	13.9 (12.3-15.5)	5,001	9.9 (8.5-11.2)
	Male	3,794	9.8 (8.2-11.3)	3,772	5.7 (4.6-6.9)
Race/Ethnicity	Black	350	17.2 (12.2-22.1)	349	14.9 (10.2-19.6)
	Hispanic	1,077	9.1 (6.7-11.6)	1,070	6.2 (4.0-8.3)
	Other Race	791	9.6 (5.4-13.7)	786	5.4 (2.9-7.9)
	White	6,460	12.6 (11.3-13.8)	6,419	7.9 (6.9-8.9)
Income	< 15,000	754	13.4 (9.6-17.2)	750	10.7 (7.2-14.2)
	\$15,000 to \$24,999	1,383	12.8 (9.7-15.8)	1,373	8.3 (6.1-10.5)
	\$25,000 to \$34,999	861	9.8 (6.7-13.0)	854	6.7 (4.0-9.5)
	\$35,000 to \$49,999	1,065	14.4 (10.8-18.1)	1,059	9.7 (6.5-13.0)
	\$50,000 to \$74,999	1,262	11.8 (8.8-14.7)	1,257	6.1 (4.4-7.8)
	\$75,000+	2,214	11.4 (9.3-13.5)	2,200	7.4 (5.7-9.1)

(BRFSS, 2014)

In Nevada the data further indicates that a greater burden of lifetime asthma is among those who make \$35,000- \$49,999 with a prevalence of 14.4%, followed by those who make less than \$15,000 with a prevalence of 13.4% and then those who make between \$15,000 - \$24,999 with a prevalence of 12.8%. In 2011, Clark County data indicates 20 deaths due to asthma as the primary cause of death and over 10,000 inpatient hospital stays (NSACP, 2014). Of those admitted to the hospital the most susceptible group appear to be the elderly (25%) and children ages 5-14 (20%). The median length of stay was two days and a median cost of \$23,205 (NSACP, 2014).

Clark County Rental Housing Policy

The Clark County Rental Housing Policy (RHP) was drafted in 2011 as part of the Nevada Healthy Homes Partnership (NHHP) (Appendix 1). The NHHP is a consortium of housing and health officials in Clark County, Nevada, focused on transitioning the Clark County Lead Poisoning Prevention Program into a more comprehensive Healthy Homes Program. Members of the NHHP were subdivided into the Policy Planning Committee, the Assessment Committee, and the Outreach & Education Committee based on their technical expertise. The Policy Planning Committee consisted of partners from North Las Vegas Code Enforcement, the Southern Nevada Health District and the University of Nevada Las Vegas, School of Community Health Sciences. Based on the limited resources in the county to address rental housing, the Policy Planning Committee determined the need to address substandard rental housing through policy development, which led to the drafted rental housing policy by the Southern Nevada Health District (SNHD).

In Clark County, Nevada rental housing is governed by the landlord-tenant chapter of Nevada Revised Statute (NRS) (NRS § 118A). In relevant parts, the NRS requires landlords to

maintain “the dwelling unit in a habitable condition” (NRS § 118A.290). Habitability is generally a function of access to certain essential conditions within the dwelling, including waterproofing, plumbing, heating, electricity, and sanitation (NRS § 118A.290). The NRS also outlines a process for tenants who inhabit dwellings that are not habitable to seek recourse (NRS § 118A.380). Upon receipt of a written complaint from a tenant alleging that the unit is not habitable due to a lack of “essential items or services” that is required by the rental agreement or the NRS (e.g. lack of heating, air conditioning, electric, gas, or water) and that the “landlord willfully or negligently fails to do so,” the landlord has 48 hours to “remedy the breach, or use his or her best effort to remedy the breach” (NRS § 118A.380). Failure of the landlord to do so can allow the tenant to recover certain damages in a legal action, withhold rent during noncompliance if the rent is otherwise current, and procure comparable housing during noncompliance (NRS § 118A.380). Alternatively, if the tenant is not responsible for causing the non-habitability, in instances where cost of repair is low (that is the greater of \$100 or a month’s rent), the tenant may notify the landlord of an intention to remedy the problem at the landlord’s expense, and after a period of time, “cause the work to be done” (NRS § 118A.360).

In contrast, non-essential service (e.g. pest infestations, mold, maintenance issues) habitability complaints, after receiving written notice from the tenant, “[i]f the landlord fails to remedy a material failure to maintain the dwelling unit in a habitable condition or make a reasonable effort to do so” within 14 days, the tenant may not only “terminate the rental agreement” but also withhold rent, recover damages, and seek other court remedies (NRS § 118A.355).

Although landlord-tenant statutes exist to address habitability concerns tenants in Clark County have to be extremely knowledgeable about the legal process in order to enact their rights

as tenants. Currently low-income renters who need access to address landlord-tenant concerns, outside of calling the landlord-tenant hotline, can contact Nevada Legal Services or Legal Aid Center of Southern Nevada. Nevada Legal Services is a federally funded program that offers a variety of services that includes addressing landlord-tenant conflicts. The Legal Aid Center of Southern Nevada (LACSN) is a private, non-profit program that primarily addresses non-eviction suits. It offers services such as the ask-a-lawyer that runs one day a week for four hours and allows tenants to meet with a lawyer for 15 minutes. LACSN also offers self-help centers. Both centers function in a limited capacity to address landlord-tenant concerns. Lack of available community programs to assist families who live in poor rental housing and the limited resources available to legally address substandard housing prompted the need to develop policy providing the SNHD enforcement authority.

The Policy Planning Committee of the NHHP set two primary goals. The first was to collect baseline data on rental housing complaints in Clark County, Nevada by establishing the Landlord-Tenant Hotline (LTH) in order to obtain better information about the problem. The LTH served as repository to assess the housing needs of renters. It took complaints from tenants and cataloged them into essential service and non-essential services complaint. The tenant was then advised that he/she must make a written request to the landlord to fix the deficiency and provide a dated copy of the letter. If no corrective action was taken within the specified timeframes established by NRS § 118A.360 for essential and non-essential services, an Environmental Health Specialist conducted a site visit and completed a healthy homes visual assessment. A voucher was provided to the tenant and the landlord that includes recommendations for corrective actions. If a deficiency was identified and the landlord took no action to correct it, the health district had no additional recourse to provide to the tenant.

Thus, the second goal of the Policy Planning Committee was to draft RHP aimed to ensure healthy housing by promoting public health and safety within rental housing and was designed to give the SNHD enforcement capabilities in order to adequately hold landlords and tenants accountable for lack of habitability. A summary of the RHP policy priorities and scope is provided in Table 7. The RHP aims to provide the structure and enforcement needed to identify housing deficiencies and have deficiencies corrected. It provides guidelines by which housing hazards can be identified. Section two specifically details public health and safety hazards, which include substantial sanitation, structural, electrical, plumbing, and mechanical hazards.

Table 7. Rental housing policy priorities & scope	
Policy Priorities	<ul style="list-style-type: none"> • Prevent and control public health and safety hazards • Regulate the safe and sanitary conditions of those areas and structures where public health nuisances previously existed • Reduce illness and injuries resulting from unsafe and unhealthy living conditions • Adopt regulations to ensure the enforcement of laws that protect public health and safety associated with the condition of rental dwellings • Establish an administrative hearing process to address such concerns • Order the abatement or removal of the nuisance and the recovery of any costs associated with any actions
Scope	<ul style="list-style-type: none"> • Establish definitions for heating, cooling, ventilation, water, sewage disposal, solid waste disposal, pest control and infestation prevention, poisoning prevention, and general sanitation • Set standards for the identification, notification and abatement of public health nuisances related to housing • Provide enforcement actions; and include provisions for recovery of the direct and administrative costs associated with the identification and, remediation of housing related public health hazards

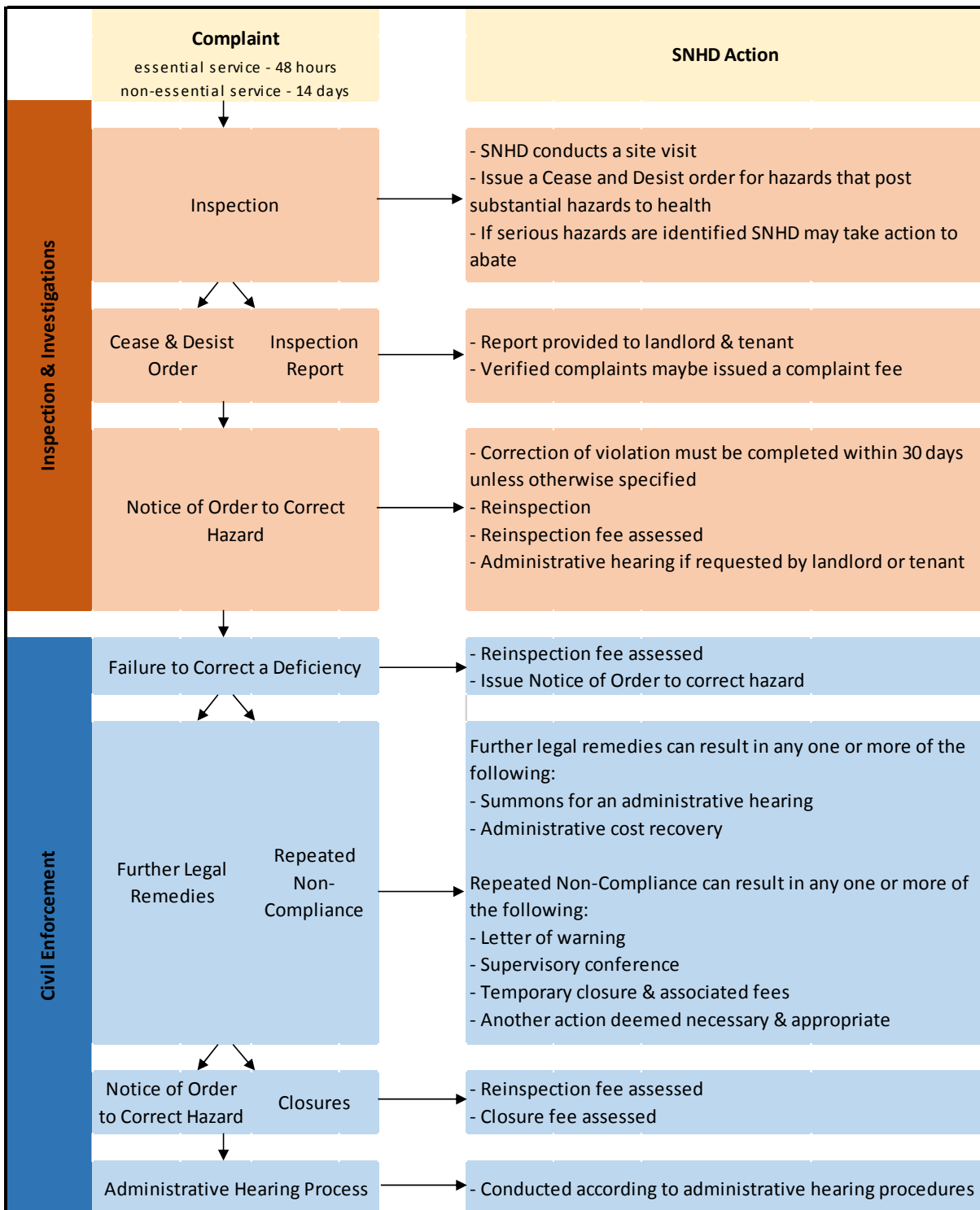
(SNHD, SNHD Regulations Governing Public Health in Housing, 2011)

The RHP would also cover the identification of other conditions that lead to substandard housing but are not considered an immediate threat to life or health. Additional sections (3-5) of the RHP include provisions for facility and equipment, general sanitation, and the control of vermin.

Sections six and seven focus on the inspection and the enforcement of identified hazards, which to are focused on protecting health. If the RHP were to be instituted the policy would function as diagramed in Figure 8. After an initial complaint, an inspection or investigation could be conducted if the issue was not resolved within timeframes specified within NRS § 118A.360. Upon completion of an inspection, the landlord and tenant would be provided with an inspection report that includes the findings from the inspection and a date by which the deficiencies must be corrected. All interested parties would also be notified of the re-inspection date. If the landlord failed to correct the violation under the parameters of the RHP, the SNHD would have the ability to “take civil enforcement action,” including “court or administrative actions, injunctive actions, and closures and may involve cost recovery, penalties, and other remedies” (RHP Section 7.1). In addition, if the landlord continues to be non-compliant, any of the following may occur: a letter of wrong could be sent, a supervisory conference will be scheduled, an order for temporary closure could be issued, and fees assessed. Alternatively, a cease and desist order and closure may result a in the event of a “substantial health hazard to the public health.” An administrative hearing is available to any party claiming it has been aggrieved in the process.

The goal of this HIA is to inform the decision makers regarding the impacts of Rental Housing Policy by evaluating the positive and negative impacts that can result from its implementation. This analysis will occur within a Healthy Impact Assessment framework. The methods of this framework are discussed in the next chapter.

Figure 8. Rental housing policy inspection and enforcement process



(SNHD, 2011)

CHAPTER 3: METHODOLOGY

Purpose of the Study

The purpose of this study is to evaluate the potential health impacts of implementing Rental Housing Policy utilizing a Health Impact Assessment (HIA). HIAs have been used in a variety of areas however, limited studies have used an HIA to evaluate housing and no HIA has been identified to evaluate rental housing policies. This HIA could enhance the ability of Clark County officials to propose a rental housing policy that maximizes positive health outcomes and minimizes negative health impacts that may result from implementation. A cross-sectional study design was used to answer research questions during the scoping phase.

Data Collection

Data was collected with the approval of the University of Nevada, Las Vegas (UNLV) Institutional Review Board (IRB) (IRB Approval Protocol #1312-4664) for the Clark County Landlord-Tenant Hotline Study (LTH) and for the Health Impact Assessment Rental Housing Policy Study (IRB Approval Protocol #760803-2). The landlord-tenant hotline data collection was initially funded by the Centers for Disease Control and Prevention (CDC) Building Strategic Alliances grant and then later funded by a grant from the Department of Housing and Urban Development (HUD).

Primary and Secondary Data

Both primary and secondary data were collected to study the impact of Rental Housing Policy. Primary data analysis included in-depth qualitative interviews with participants who contacted the landlord-tenant hotline from 6/16/2015 – 8/07/2015. Participants were asked if they wished to participate in a Health Impact Assessment of Rental Housing Policy study. If participants agreed they were contacted for follow-up and once consented were interviewed.

Secondary data analysis was conducted on the following three datasets: (1) housing complaint type and ZIP code was analyzed using the landlord-tenant hotline database collected from 5/1/11 through 4/30/13, (2) correction of housing deficiencies was analyzed using the landlord-tenant hotline historical follow-up call data collected from 3/13/14 through 5/26/15, and (3) asthma health and presence of environmental triggers was analyzed using combined data, from the 2011, 2012, and 2013 Nevada Adult Asthma call-back survey, collected by the Behavioral Risk Factors and Surveillance System (BRFSS). A summary of primary and secondary data is provided in Table 8.

Table 8. Primary and secondary data used to evaluate rental housing policy		
	Database	Data Variables
Secondary	Landlord-tenant hotline database collected from 5/11/11 - 4/30/13	Housing complaint type ZIP code
Secondary	Landlord-tenant hotline database for historical follow-up calls (population who contacted the landlord-tenant hotline from 5/11/11 through 4/30/13) collected from 3/13/14 - 5/26/15	Correction of housing deficiencies
Secondary	2011, 2012, and 2013 Nevada BRFSS Adult Asthma call-back survey	Environmental triggers Asthma episode or attack Housing tenure
Primary	Recruitment for qualitative interviews occurred from callers into the landlord-tenant hotline collected from 6/16/2015 – 8/07/2015	Qualitative interviews

Asthma Call-Back Survey & Weighting

The BRFSS data is collected on an annual basis with over 400,000 adults nationwide using a random selection process. It is a phone based interview that collects state and local data on health indicators, behavioral risk factors, and use of preventive services. The BRFSS runs three different modules with the core data collected consistently across the US, and state specific questions and optional modules, such as the adult asthma call-back survey which was used in this

study. The adult asthma call-back survey is a follow up survey conducted about two weeks after the participants have completed the core data and have reported ever being diagnosed with asthma and have agreed to a follow-up call. All BRFSS data is weighted data, thus weighting was included in the statistical analysis.

Weighted data is data that has been adjusted to account for differences between those who participated in survey and those who did not; it is an attempt to remove bias from the sample. BRFSS weighting process has two distinct steps; design and rank weighting. Design weighting adjust for the number of phones and adults in each household; while accounting for number of available records, number of selected records within a geographic region, and density (BRFSS, 2013). Rank weighting builds in population characteristics into the sample using in iterative process. Ranking variables include “race and ethnicity, sex, age, home ownership, education, marital status, phone ownership and region” (BRFSS, 2013). Data were analyzed using SPSS version 20 an add-on for complex samples; A data plan was created using the following weighting variables: sample design stratification (_STSTR) which accounts for the differences in selection, final weight (_LLCP_WGT) which is the final weight assigned to each respondent for landline and cellular phones, and primary sampling unit (_PSU) which accounts for population characteristics.

HIA Rental Housing Policy Methods

Screening

In a typical HIA stakeholders and community members are an intricate part of the planning process. However, this HIA was conducted in the form of a rapid or desktop HIA in which the study was piloted in a short period of time with minimal personnel. The screening phase of typical

HIA considers if a policy is of value; if changes can result in significant effects on population health; if health effects of concern can be identified; and if there is potential to make policy recommendations. Initial work conducted by the Nevada Healthy Homes Partnership (NHHP) members, which includes housing and health professionals who serve the Clark County area, substantiated the need to address the condition of rental housing in Clark County given the minimal resources and services in the area to address rental housing concerns. The initial focus was to obtain baseline data in regards to housing complaints among renters and to propose Rental Housing Policy that would be enforceable by the Southern Nevada Health District. This decision was also supported by the current literature regarding the direct and indirect relationship and impact between poor housing and health. This HIA intends to characterize asthma health and housing conditions among renters in Nevada, review the effectiveness of the landlord tenant hotline model and explore the health benefits and possible impacts if the policy were to be implemented. Table 9 outlines the objectives for this HIA.

Table 9. HIA rental housing policy objectives	
HIA Rental Housing Policy Objectives	
O1	To characterize asthma health of Nevada residents.
O2	To characterize housing complaints of callers into the landlord tenant hotline.
O3	To examine differences in resolving housing deficiencies.
O4	To identify inequities and vulnerable populations that may be disproportionately affected by Rental Housing Policy.
O5	To make recommendations and design alternatives before implementation of rental housing policy.

Scoping

The scoping phase of an HIA develops a logic model to identifying the interactions between policy decisions, health determinants and health outcomes. Figure 9. examines these connections. The strongest evidence based data on housing and health is found within the microenvironment.

Figure 9. Pathways between housing and health

	Societal	Macroenvironmental	Microenvironmental	
	Deprivation	Neighborhood	Design	Maintenance
Housing Factors	<ul style="list-style-type: none"> Homelessness Affordability Neighborhood housing quality inequities 	<ul style="list-style-type: none"> Crime & Violence Traffic Access to healthy amenities Collective efficacy 	<ul style="list-style-type: none"> Heating Ventilation Air Conditioning (HVAC) Water supply Materials Structural integrity Lighting Stairways Common areas 	
Determinants	<ul style="list-style-type: none"> Housing tenure Overcrowding Economic trade-offs 	<ul style="list-style-type: none"> Safety Noise Air pollution Sidewalks, greenspace, recreation, schools, work, shopping, food environment 	<ul style="list-style-type: none"> Lead exposure Mold exposure Pest infestation Exposure to allergens Temperature extremes Air pollution Exposure to radon Exposure to asbestos Exposure to toxic chemicals Dirty carpets Social interaction Safety 	
Health outcomes	<ul style="list-style-type: none"> Infectious disease Poor nutrition 	<ul style="list-style-type: none"> Mortality Physical activity Cardiovascular health Depression Infectious disease Poor nutrition Obesity/overweight 	<ul style="list-style-type: none"> Neurodevelopment Mortality Physical activity Cardiovascular health Depression Infectious disease Stress Asthma & respiratory health Cancer Heat and cold related illness Injuries 	

(Seto, et al., 2009)

For instance, prior to instituting laws to ban the presence of lead based-paint in homes we have recognized the impact of unmaintained conditions of leaded-paint on the neurological development of young children (Jacobs, et al., 2002; Seto, et al., 2009). Today we have a greater understanding of the impact of housing on health, in particular on respiratory health.

In 2000 the Institute of Medicine Report established a causal relationship between the development of asthma and exposure to specific asthma triggers in the home (IOM, 2000). Figure 9 depicts the complexities of how health can be impacted directly and indirectly by our home. Given the nature of these complexities this HIA will be limited to examining the relationship between asthma health among renters and homeowners utilizing the Nevada BRFSS data, type of housing complaints, and resolution of those complaints. Table 10 outlines specific research questions to be answered.

Table 10. HIA rental housing policy research questions	
HIA Rental Housing Policy Research Questions	
RQ1	Are their differences in essential service complaints among families of varying income in Clark County, NV?
RQ2	Are their differences in having a housing deficiency corrected by income?
RQ3	Is there a relationship between the number of environmental asthma triggers present in the home and those who report an asthma attack or episode in the last 12 months?
RQ4	Are their differences in reporting an asthma episode or attack in the last 12 months among renters and owners?
RQ5	What are the perceptions, attitudes and beliefs of renters in regards to the proposed rental housing policy for Clark County, NV and how housing affects their health?

Assessment

The purpose of the assessment phase is to compile and evaluate the data to inform policy decisions. This HIA evaluated the housing complaints reported to the landlord-tenant hotline and how effective the landlord-tenant hotline is at correcting housing concerns without an enforceable

housing policy. This HIA utilized secondary asthma data collected through the BRFSS to characterize asthma health among renters and homeowners. Further, it examined the perceptions, attitudes, and beliefs of renters in terms of their existing housing conditions, barriers to quality housing, neighborhood characteristics and the proposed implementation of rental housing policy in Clark County, NV. The study is designed as a mixed-methods approach using both quantitative and qualitative methods. Research questions and hypothesis to be evaluated are as follows:

Table 11. Hypothesis one	
Alternate Hypothesis One	
RQ1	Are their differences in essential service complaints among families of varying income in Clark County, NV?
H _{A1}	The proportion of essential service complaints will be highest among participants who are below 80% of median income.
Independent variable	Below 80% median income/ above 80% median income (categorical data)
Dependent variable	At least one essential service complaint (dichotomous data)
Statistical measure	Pearson's chi-square test

Housing complaint data were taken from callers who contacted the landlord-tenant hotline from 5/11/11 through 4/30/13. Rental housing complaints were categorized based on essential and non-essential service complaints. Essential service complaints include the sporadic or permanent loss of HVAC services, water, electricity or gas. Non-essential services include complaints such as, mold, roaches, rodents, general maintenance (e.g. appliances, electrical issues, fire damage etc...), bedbugs, other insects (all bugs other roaches and bedbugs), odor, sewage, domestic animal, pigeon, hoarder, or other. Median income data per zip code was gathered using 2013 U.S. Census estimates per each corresponding zip code, after which the data was coded to indicate if the median income per zip code was above or below the Department of Housing and Urban

Development (HUD) income guidelines for 80% of median income for a family size of 4; Per HUD guidelines 80% of median income is considered low income. The following calls were excluded from data analysis: duplicate entries, inquiry calls, landlord/owner calls, calls with no housing complaint documented, calls with no zip code, and calls outside of Clark County.

Utilizing median income for Clark County (\$59,200) calls were coded based on whether the corresponding zip codes were below or above 80% of median income. The contingency table was dichotomized into below and above 80% median income and whether they made at least one essential service complaint. Essential services include non-functioning: heating, air conditioning, water, electricity or gas. A Pearson’s chi-square test was utilized to determine the relationship between household income and the lack of essentials services with a significance of $\alpha = 0.05$.

Table 12. Hypothesis two	
Alternate Hypothesis Two	
RQ2	Are their differences in having a housing deficiency corrected by income?
H _{2A}	The proportion of those whose housing deficiencies were not corrected were among those whose income is below 80% of median income.
Independent variable	Below 80% of median income/Above 80% of median income (categorical data)
Dependent variable	Housing deficiencies corrected (categorical data)
Statistical measure	Pearson’s chi-square test

To answer alternate hypothesis two, data was collected from follow up calls made from 3/13/14 through 5/26/15 to those who had previously called into the hotline to determine if their housing complaint was resolved. Two follow-up calls were made before being administratively dropped or otherwise dropped because the number was wrong or no longer working, no contact was made, or the person declined participation.

According to the 2013 US Census estimates Clark County median income is \$59,200. Utilizing median income for Clark County calls were coded based on whether the corresponding zip code was below or above 80% of median income. The contingency table was dichotomized into below and above 80% median income and whether the housing deficiency was corrected. A housing deficiency was considered corrected if the initial complaint was resolved per self-report of the tenant. A Pearson's chi square test was utilized to determine the relationship between median income and having housing deficiencies corrected with a significance of $\alpha = 0.05$.

Table 13. Hypothesis three	
Alternate Hypothesis Three	
RQ3	Is there a relationship between the number of environmental asthma triggers present in the home and those who report an asthma attack or episode in the last 12 months?
H _{A3}	There is an association between the number environmental asthma triggers and reporting an asthma attack or episode in the last 12 months.
Independent variable	Environmental asthma triggers (categorical)
Dependent variable	Asthma episodes/attacks (dichotomous data)
Statistical measure	Multiple logistic regression

To test alternate hypothesis three, data from the 2011, 2012, and 2013 Nevada BRFSS Adult Asthma Call-Back survey were combined and analyzed. Since the data is weighted, data analysis included weights into the statistical analysis as described above. The following survey question was analyzed: During the past 12 months, have you had an episode of asthma or an asthma attack? The dichotomized yes or no answers were entered into the model with no asthma attack as the reference value.

Eleven BRFSS questions were identified as environmental asthma triggers and include: 1. identification of mold by sight or smell, 2. have household pets, 3. pets allowed in bedroom, 4.

evidence of cockroaches, 5. evidence of rodents, 6. unvented gas appliances, 7. gas used in cooking, 8. wood/stove fireplace used in home, 9. tobacco smoke usage in the home, 10. carpeting in bedroom, and 11. if they have ever have been asked to change home or school to improve asthma. Cross tabulations were run using the Rao Scott adjusted χ^2 which is an adjusted version of the Pearsons chi-square test used for survey data. A multiple logistic regression was used to determine the association between reporting an asthma episode or attack in the last 12 months and the number of asthma triggers with a significance of $\alpha = 0.05$. A total count of the environmental asthma triggers was derived from the eleven categories in the survey. The continuous variable was then categorized to compare if an increase in the number of asthma triggers predicted an asthma attack. Categories included one to two triggers, three to five triggers and six plus triggers. Age and sex were adjusted in the model as they are predictors of an asthma attack. Variance inflation factors (VIF) and tolerance values were evaluated to identify multicollinearity concerns. Multicollinearity concerns arise when predictor variables are correlated.

Table 14. Hypothesis four	
Alternate Hypothesis Four	
RQ4	Are there differences in reporting an asthma episode or attack in the last 12 months among renters and owners?
H _{A4}	More renters will report experiencing an asthma episode or attack in the last 12 months.
Independent variable	Renter/owner (categorical data)
Dependent variable	Asthma episodes/attacks (dichotomous data)
Statistical measure	Multiple logistic regression

To answer alternate hypothesis four, data from the 2011, 2012, and 2013 Nevada BRFSS Adult Asthma Call-Back survey were combined and analyzed. Since the data is weighted data analysis included weights into the statistical analysis as described above. The following BRFSS

adult asthma follow-up survey question was analyzed: During the past 12 months, have you had an episode of asthma or an asthma attack? The dichotomized yes or no were entered into the model with no asthma attack as the reference value. Housing tenure (renter or owner) was used as a dichotomized independent variable. Cross tabulations were run using the Rao Scott adjusted χ^2 which is an adjusted version of the Pearsons chi-square test used for survey data. A multiple logistic regression was used to determine the association between reporting an asthma episode or attack in the last 12 months and housing tenure with a significance of $\alpha = 0.05$. Age and sex status were adjusted in the model as they are predictors of an asthma attack. VIF and tolerance values will be evaluated to identify multicollinearity concerns.

Table 15. Hypothesis five	
Alternate Hypothesis Five	
RQ5	What are the perceptions, attitudes and beliefs of renters in regards to the proposed rental housing policy for Clark County, NV and how housing affects their health?
Statistical measure	Qualitative analysis

This part of the study is designed as a qualitative phenomenological study, which describes people from a specific group, using semi-structured interview format. The phenomenological approach explores a particular phenomenon within a group who have all experienced a similar phenomenon (Creswell, 2013). In this study the phenomenon is housing conditions that have precipitated a call into the landlord-tenant hotline. Creswell (2013) suggest that a heterogeneous mix within a phenomenological design can range from 3-4 people to 10-15 people.

A semi-structured format allowed the flexibility for the interviewer to direct the interview through a personal narrative. The phenomenological approach is used to capture in-depth data of the lived experience of the respondents (Holloway, 2005). Phenomenology allows for the

interviewer to use probing and reflective methods to capture the interviewees' perception, in this case, about their housing, how their homes affect their health, neighborhood characteristics and implementation of proposed rental housing policy.

Interviewees were selected using a purposeful sample technique, a common technique within qualitative analysis (Mack, Woodsong, MacQueen, Guest, & Namey, 2005). Employing purposeful sampling allowed selection of past callers who participated in the landlord tenant hotline study and agreed to a follow-up call to participate in the HIA Rental Housing Policy study. Interview questions were conducted over the phone after the participant provided verbal consent to participate in the study and have the interview recorded. Phone calls were recorded with a recording device in order to transcribe the interview. Interviews were conducted during a time most convenient to the participant. Attempts to reach participants were made through out various times of the day in order to increase enrollment.

Interview questions (Appendix 2) were constructed to cover inquiries into: current housing conditions, how housing conditions have affected their health, neighborhood characteristics, and implementation of the proposed rental housing policy. After each interview a contact summary form (Appendix 3) was completed to summarize issues during the interview, relevant information, and themes (Miles & Huberman, 1994); after which transcription occurred. Interviews were entered into a Word file on a password protected computer. Interviews were then reviewed for common codes and themes. Using an inductive approach allowed for building a coding system that directly evolved from the lived experience of the participants (Burnard, Gill, Stewart, Treasure, & Chadwick, 2008). Thus during the transcription process hand written notes were made to attach "labels for assigning units of meaning" that could later be used for inferential analysis (Miles & Huberman, 1994). Each interview was transcribed to identify codes that developed from

the interview process. Once a set of codes evolved, the codes were categorized into themes. A two-coder system was used in order to achieve inter-coder agreement on identified codes and themes. Once all the codes and themes were identified the data were interpreted.

Recommendations for Mitigation and Design Alternatives

Based on the research questions, findings and a review of the literature policy recommendations and design alternatives were drafted and are discussed in detail in Chapter 5: Discussion and Recommendations.

Reporting

The results of this HIA are reported in the form of a comprehensive manuscript that includes all six steps of the HIA process. However, a completed HIA is generally disseminated in various formats to meet the needs of the audience it is intended to target. For example, a brief one-page summary of the HIA can be disseminated among community members who have a vested interest in changing housing policy in Clark County, NV. A one page policy brief is provided in Appendix 4. Further, the HIA findings and recommendations could be used to inform the Southern Nevada Health District's Board of Health.

Evaluation & Monitoring

Evaluation and monitoring are an integral part of an HIA. As such monitoring and evaluation measures which include process, impact and outcome measures are discussed in detail in Chapter 5 Discussion and Recommendations.

Data Analysis

Data analysis was conducted using SPSS for Windows® Version 20.0 with complex samples add-on and Version 22.0. The following tests were performed: Chi Square and logistic regression. Qualitative analysis was performed by using Microsoft Excel.

CHAPTER 4: RESULTS

A review of the literature and data analysis for this mixed-methods study design was conducted to answer the proposed research questions, to guide Rental Housing policy recommendations and to make future research recommendations. This chapter is subdivided to summarize the findings related to housing conditions, asthma health and qualitative inquiry.

Inequities within Housing in Clark County Nevada

The purpose of this HIA was to identify vulnerabilities within housing in Clark County, Nevada by examining the differences in essential service complaints among those who were above or below 80% of median income as per HUD guidelines. Essential services are considered amenities in which a tenant should not be left without and should these services be interrupted, they must be resolved within 48 hours. In addition, this HIA aims to identify if there are differences between income (above or below 80% median income) and resolution of their housing complaint.

A total of 3,731 calls were made to the landlord tenant hotline from 5/1/11 – 4/30/13. However, after excluding duplicates, inquiry calls, calls with no documented housing complaint, calls with no zip code, calls by landlords/owners and calls outside of Clark County geographical boundaries a total of 2,865 calls were used for analysis. A total of 561 calls had at least one essential service complaint which includes the sporadic or permanent loss of HVAC services, water, electricity or gas. Estimates from the 2013 U.S. Census for median income per zip code were used in the data analysis per corresponding zip codes. Calls per zip code ranged from 1 call to 246 calls. Table 16. summarizes the number of calls by income, essential and non-essential service complaint, and zip codes with over 100 calls. All zip codes with over 100 calls represent zip codes at or below 80% of median income. Zip code 89101 had the largest number of calls at 246 during the study period; The number of calls from this zip code could be in indication of the

number of rental units in the corresponding zip code, which according to census data is almost 80%.

Table 16. Summary of income, zip code and essential and non-essential service complaint			
Income Limits		N	%
80% of median income & below	50% of Median Income ≤ \$30,700	459	16%
	80% of Median Income ≤ \$30,701-\$49,100	1671	58.3%
Above 80% of median income	Below Median Income ≤ \$49,101-\$59,199	462	16.1%
	Above Median Income ≥ \$59,200	273	9.5%
Essential Service Complaint		N	%
HVAC Outage		392	13.7%
Water Outage		185	6.5%
Electric or Gas Outage		28	1%
Non- Essential Service Complaint		N	%
Mold		975	34%
General Maintenance		931	32.5%
Bed Bugs		540	18.8%
Cockroaches		427	14.9%
Other		235	8.2%
Other Insects		170	5.9%
Odor		164	5.7%
Sewage		131	4.6%
Rodents		85	3%
Pigeons		39	1.4%
Domestic Animal		33	1.2%
Zip codes with 100 + Calls		N	%
50% of median income	89101	246	22.9%
	89030	110	3.8%
	89106	100	3.5%
80% of median income	89121	207	7.2%
	89119	206	7.2%
	89169	188	6.6%
	89115	179	6.2%
	89104	171	6%
	89108	133	4.6%
	89102	121	4.2%
*Clark County median income is \$59,200			
*Housing complaint data previously analyzed by Sokolowksy (2014)			
*Landlord-tenant hotline data collected from 5/1/11-4/30/13			

Of the 2,865 calls retained in the model, a total of 268 calls received a follow-up call between 3/13/14 – 5/26/15 to determine if their housing complaint had been resolved. A total of

266 persons responded at follow-up (Table 17). A housing deficiency was considered corrected if the initial complaint was resolved per self-report of the tenant. Of those who received a follow-up, call a total of 92 (34.6%) had their complaint resolved; of which 62 (67.4%) were at or below 80% median income and 30 (33.3%) were above 80% median income. Of the total follow-up calls 63 were for essential service complaints, 215 for non-essential service complaints and 18 for both an essential and non-essential service complaint.

Table 17. Number of housing deficiencies resolved by 80% of median income		
	Housing Deficiency Corrected N (%)	Housing Deficiency Not Corrected N (%)
At or below 80% of median income	62	114
Above 80% of median income	30	60

Results

H_{a1}: The proportion of essential service complaints will be highest among participants who are below 80% of median income.

Analysis indicated a significant relationship between income and reporting at least one essential service complaint using a $X^2 = 5.566$, $p < .05$. Thus more essential service complaints were made from lower income communities.

H_{a2}: The proportion of those whose housing deficiencies were not corrected were among those whose income is below 80% of median income.

Analysis indicated no significant association between income and a housing resolution using a $X^2 = .095$, $p = .76$. Thus having a housing complaint resolved was not significant with income.

Asthma Health in Nevada

To evaluate housing tenure status and the number of environmental triggers present in the home as a predictor of an asthma attack or episode, data from the 2011, 2012, and 2013 Nevada BRFSS Adult Asthma Call-Back Survey were combined and analyzed, in which responses from a

total of 614 adults who reported ever being diagnosed with asthma were included in the analysis. Of those surveyed, a total of 252 (41%) indicated an asthma episode or attack in the last 12 months. Tenure status was broken down by a total of 189 (41.9%) renters and 402 (54.9%) owners. A total of 180 (62.7%) represented those who live in Clark County, while 226 (17.8%) were from Washoe County, and 208 (19.5%) from the remainder of the state. Additional demographic variables which include age, sex, race/ethnicity, income, housing tenure status and smoking status are summarized in Table 18.

The asthma call-back survey asked participants about environmental asthma triggers that can be present in the home and protective measures used to manage or control asthma. Eleven environmental asthma triggers were identified in the survey as well as six measures that were considered protective. Asthma triggers consisted of the use of gas while cooking; if mold, cockroaches, and rodents identified within the last 30 days; if pets live in the household and whether they are allowed in the bedroom; the use of carpet(s) in the bedroom; use of wood stove/fireplace or unvented gas appliances; if smoking was allowed in the home in the last week and if they have ever advised by a health professional to change something in the home (Table 19). The most common asthma triggers reported include; the use of carpet(s), allowing pets in the bedroom, having indoor household pets, and the use of gas appliances for cooking. Six protective measures identified in the survey include the use of an air cleaner, the use of dehumidifier, the use of fans in the kitchen and bathroom fan with outside ventilation, and the use of mattress and pillow covers (Table 19). The most common protective measure employed in the home were regular use of a bathroom fans and kitchen fans that vent to the outside.

Table 18. Demographic data from the 2011-2013 Nevada BRFSS adult asthma call-back survey

Demographic	Grouping	N	Percent Weighted % (95% Confidence Interval)
Statewide	Nevada	614	100.00 (100.0-100.0)
Region	Clark County	180	62.7 (57.0-68.5)
	Washoe County	226	17.8 (14.3-21.2)
	Balance of State	208	19.5 (14.9-24.1)
Age	18 – 24	24	9.3 (4.6-14.1)
	25 – 34	44	22.7 (13.3-32.1)
	35 – 44	68	20.4 (14.3-26.6)
	45 – 54	128	20.0 (14.0-26.0)
	55 – 64	157	14.4 (10.4-18.3)
	65+	193	13.2 (9.8-16.6)
Sex	Female	417	58.1 (49.4-66.8)
	Male	197	41.9 (33.2-50.6)
Race/Ethnicity	Black	21	10.2 (4.8-15.7)
	Hispanic	38	10.6 (5.7-15.4)
	Other Race	65	13.5 (4.5-22.5)
	White	484	65.7 (56.6-74.8)
Income	< 15,000	74	14.5 (7.5-21.5)
	\$15,000 to \$24,999	105	25.0 (15.8-34.3)
	\$25,000 to \$34,999	59	9.9 (5.3-14.6)
	\$35,000 to \$49,999	80	14.4 (9.2-19.7)
	\$50,000 to \$74,999	94	12.4 (8.3-16.5)
	\$75,000+	135	23.7 (17.3-30.1)
Housing Tenure	Owner-occupied	402	54.9 (46.7-63.1)
	Renter-occupied	189	41.9 (33.7-50.1)
Smoking	Current smoker	115	25.9 (17.3-34.5)
	Former smoker	208	29.3 (22.0-36.6)
	Never smoked	288	44.8 (36.7-52.9)

Rao Scott adjusted χ^2 test and a multiple logistic regression model was run for each of the environmental asthma triggers identified in the survey. This study examined the relationship between the total number of environmental asthma triggers and experiencing an asthma episode or attack in the last 12 months in a sample size of 578.

Table 19. Environmental asthma triggers and protective measures as reported in the 2011-2013 Nevada BRFSS adult asthma call-back survey

Question	Sample Size	Yes Weighted % (95% Confidence Interval)	No Weighted % (95% Confidence Interval)
Asthma Triggers			
Gas used in cooking	613	70.0 (63.4-76.5)	30.0 (23.5-36.6)
Past 30 days saw or smelled mold	610	7.5 (1.7-13.3)	92.5 (86.7-98.3)
Have household pets	613	63.1 (55.2-71.1)	36.9 (28.9-44.8)
Pets allowed in bedroom	406	83.9 (78.0-89.8)	16.1 (10.2-22.0)
Last 30 days seen a cockroach in house	614	22.6 (13.1-32.1)	77.4 (67.9-86.9)
Last 30 days seen a rodent in house	613	5.6 (1.3-9.9)	94.4 (90.1-98.7)
Wood stove/fireplace used in home	611	10.7 (6.3-15.1)	89.3 (84.9-93.7)
Use of unvented gas logs, gas fireplace, gas stove	611	2.8 (1.2-4.4)	97.2 (95.6-98.8)
Past week anyone smoked in home	614	21.2 (12.6-29.8)	78.8 (70.2-87.4)
Ever advised to change home, school, work to improve asthma by health care provider	606	29.7 (22.3-37.1)	70.3 (62.9-77.7)
Have carpet or rug in bedroom	614	75.0 (68.3-81.7)	25.0 (18.3-31.7)
Protective Measures			
Regular use of an air cleaner	612	26.0 (18.7-33.2)	74.0 (66.8-81.3)
Regular use of a dehumidifier	611	10.5 (5.1-15.9)	89.5 (84.1-94.9)
Kitchen fan with outside vent	610	61.1 (52.9-69.3)	38.9 (30.7-47.1)
Use mattress cover to control mites	590	29.2 (22.1-36.2)	70.8 (63.8-77.9)
Use pillow cover to control mites	600	24.6 (17.6-31.6)	75.4 (68.4-82.4)
Regularly use of a bathroom fan that vents to the outside	606	64.7 (56.4-73.0)	35.3 (27.0-43.6)

The only statistically significant relationship identified among the asthma triggers was whether the participant had ever been asked by a health professional to make changes to the home environment to improve asthma health with experiencing an asthma episode or attack at a significance $\chi^2 = 19.58$, $p < .05$ (Table 20). A multiple logistic regression analyzed the total number of asthma triggers and experiencing an asthma episode or attack. Participants experienced a range of triggers from no asthma triggers to as many as eight asthma triggers in the home; with four asthma triggers being the median number of asthma triggers reported by 148 (24.5%) participants.

Table 20: Cross tabulation of environmental triggers and asthma episode or attack			
BRFSS Question		Yes Asthma Episode or Attack N (Weighted %)	No Asthma Episode or Attack N (Weighted %)
Gas used in cooking	Yes	150 (24.8)	210 (34.8)
	No	102 (16.9)	142 (23.5)
Past 30 days saw or smelled mold	Yes	18 (3)	17 (3)
	No	232 (38.6)	334 (55.6)
Have household pets	Yes	161 (26.7)	239 (39.6)
	No	91 (15)	113 (18.7)
Pets allowed in bedroom	Yes	135 (33.8)	193 (48.4)
	No	26 (6.5)	45 (11.3)
Last 30 days seen a cockroach in house	Yes	16 (2.6)	26 (4.3)
	No	236 (39)	327 (54.1)
Last 30 days seen a rodent in house	Yes	15 (2.5)	12 (2)
	No	237 (39.2)	340 (56.3)
Wood stove/fireplace used in home	Yes	40 (6.7)	55 (9)
	No	212 (35)	296 (49.1)
Use of unvented gas logs, gas fireplace, gas stove	Yes	9 (2)	17 (3)
	No	242 (40.2)	334 (55.5)
Past week anyone smoked in home	Yes	41 (6.8)	51 (8.4)
	No	211 (34.9)	302 (49.9)
Ever advised to change home, school, work to improve asthma by health care provider**	Yes	106 (17.8)	89 (15)
	No	141 (23.6)	261 (43.7)
Have carpet or rug in bedroom	Yes	204 (33.7)	48 (7.9)
	No	282 (46.6)	71 (11.7)
**Rao Scott χ^2 test was statistically significant for advised to make a home modifications by a health care provider and asthma episode or attack; Rao Scott and adjusted $\chi^2 = 19.58, p > .05$			

After controlling for age and sex, the multiple logistic regression indicated a 25% increased risk in experiencing an asthma episode or attack among those who report more than six environmental asthma triggers compared to those who reported one to two triggers with and odds ratio of 1.25

and 95% CI .43-3.66. The data also indicated a 12% increase in risk of an asthma episode or attack among those who reported three to five triggers compared to those who reported one to two triggers in the home with an odds ratio of 1.12 and a CI .63-1.99. Neither regression model reached statistical significance. VIF and tolerance values indicated no concerns with multi-collinearity among predictor variables.

Rao Scott adjusted χ^2 test was conducted for housing tenure status against asthma episode or attack (Table 21). No statistically significant relationship between the two variables was found with significance of $\chi^2 = .006, p = .94$.

Table 21. Summary of asthma episode or attack by housing tenure		
Housing Tenure	Asthma Episode or Attack in past 12 months	Asthma Episode or Attack in past 12 months
	No N (%)	Yes N (%)
Renter-Occupied	86 (14.9)	99 (17)
Owner-Occupied	158 (27)	240 (41)
Rao Scott $\chi^2 = .006, p < .938, N = 583$		

A multiple logistic regression model analyzed housing tenure status and asthma episode or attack (Table 22). After controlling for age and sex the multiple logistic regression indicated that compared to those who own, renters are 21% more likely to have an asthma episode or attack in the last 12 months with an odds ratio of 1.21 and 95% CI .85-1.72; which did not reach statistical significance. However, it was found that the 35-44 age group are almost four times more likely to report an asthma episode or attack compared to those 65+ with and odds ratio of 3.79 and 95% CI 1.67-8.61. VIF and tolerance values indicated not concerns with multi-collinearity among predictor variables.

Table 22. Odds ratios of an asthma episode or attack among owners and renters in Nevada		
	Odds Ratio	95% Confidence Interval
Renter	1.21	0.85-1.72
Sex Female vs Male	1.19	0.60-2.35
Age		
18-34 vs 65+	1.57	0.67-3.69
35-44 vs 65+	3.79	1.67-8.61
45-54 vs 65+	0.62	0.26-1.50
55-64 vs 65+	1.77	0.87-3.62

Results

H_{a3}: There is an association between the number environmental asthma triggers and reporting an asthma attack or episode in the last 12 months.

The data suggest a 25% increase in experiencing an asthma episode or attack among those who have more than six environmental asthma triggers in the home compared to those who report one to two triggers and a 12% increase among those who report three to five triggers in the home compared to those who report one to two triggers. Regression model did not reach statistical significance.

H_{a4}: More renters will report experiencing an asthma episode or attack in the last 12 months.

The data suggest a 21% increase in experiencing an asthma episode or attack among those who are renters then those who do not rent although was not statistically significant.

Qualitative Inquiry

The qualitative inquiry used a phenomenological study design, which describes people from a specific group, using semi-structured interview format. The phenomenological approach explores a particular phenomenon within a group who have all experienced a similar phenomenon (Creswell, 2013). In this study the phenomenon is housing conditions that have precipitated a call into the landlord-tenant hotline.

Interviews were conducted over the phone from a list of 63 participants interested in receiving a follow-up call to participate in the study, representing a total of 26 different zip codes. Of the 63 persons on the list, a total of 43 (68%) were contacted to participate; 14 (22%) were scheduled for a follow-up call, but did not answer at follow-up or postponed the call, and 12 (19%) were left messages. The biggest challenge was holding participants to scheduled appointment times; many would not respond at follow-up or continue to postpone calls to a later date.

At final count, a total of 17 (27%) people agreed to participate in the study. Interviews ranged from a minimum of 10:43 to 35:57 minutes, with an average call of 21:18 minutes. Of the 17 who agreed to participate in the study 2 (12%) were male while 15 (88%) were female. Participants range in age from 20 years old to 61 years old with a mean age of 37.53 years. Five (29%) of the participants identified themselves as Hispanic Latino, while the remainder 12 (71%) identified themselves as non-Hispanic Latino. Of the seventeen participants 2 (12%) indicated their housing complaint was resolved and 9 (53%) sought some type of legal recourse to resolve housing deficiency. The most common housing complaint among those who participated in the qualitative interviews was concerns with mold. Table 23 further summarizes the type of housing complaints experienced by those who participated in the qualitative interview and the zip code in which they reside at the time of the housing complaint.

The qualitative analysis utilizing a two-coder system revealed over 45 different codes with 6 over-arching themes. Identified themes included: (1) housing conditions and health impact, (2) neighborhood characteristics, (3) housing displacement, (4) housing resolution and remediation, (5) effectiveness of correcting housing deficiencies, and (6) policy recommendations; each of the themes are discussed in more detail below.

Table 23. Profile of participants who participated in qualitative interviews			
Demographics		N	%
Gender			
Male		2	12%
Female		15	88%
Age			
Range 20-61		---	---
Average 37.53 years			
Ethnicity			
Hispanic Latino		5	29%
Non-Hispanic Latino		12	71%
Complaint Type		N	%
Mold		9	53%
General Maintenance		8	47%
Cockroaches		6	35%
HVAC Outage		5	29%
Bedbugs		3	18%
Other Insects		3	18%
Zip Codes		N	%
50% of median income	89101	1	6%
80% of median income	89169	2	11.25%
	89102	1	6%
	89104	1	6%
	89119	2	11.25%
	89103	1	6%
	89109	1	6%
	89108	4	23.5%
	89122	1	6%
Above 80% of median income	89142	1	6%
	89011	1	6%
	89141	1	6%

(1) Housing Conditions & Health Impact

Understanding how housing can impact health is complicated because it is mediated through direct and indirect influences from the environment in which people live. Direct influences include housing insecurity and poor housing conditions, such as exposure to damp conditions, mold, or the inability to adequately heat and cool our homes. Alternatively, one's socio-economic status, the make-up of one's communities and neighborhoods which include the availability or lack

of services, from education, health care services, to access to healthy food, play an indirect role on health. Indirect factors also account for a person's sense of well-being and a sense of connectedness & community. This component of the study aimed to identify what direct and indirect influences impact renters in Clark County, NV.

Participants detailed their experiences of living in substandard housing; which included addressing concerns with mold/dampness or some type of water intrusion, asbestos, roaches, bedbugs and a loss of essential services like water and AC. Many tenants reported going without AC or warm water for months at a time. The following tenant who is an expectant mother describes how she had gone without AC and used not paying her rent as a means to invoke action among her landlord to fix her housing concerns. She also discussed what she feels as her barriers to moving elsewhere:

“When I first moved into my apartment I had problems with my air conditioning and I told the office and the office came in and fixed the wall unit because they had to like smash it to turn it on. And it would shut off within ten minutes anyways. And it wasn't on that long. It was uh, warm air coming out it wasn't even like AC or anything... Um, and so it's not even completely fixed yet. And I was paying rent all the way up until the end of May. I paid May's rent. And then I didn't pay June or July and I didn't pay this month's rent either because they're still not fixing it and they fired all the maintenance that are supposed to be working in my unit.... And um, my house was about the same temperature as it was outside if not hotter.... Uh, The only problem is is that it did get super-hot and I never wanted to be home... Um, right now, the money situation, um I haven't found an apartment that's cheaper and I don't feel like I should. I don't feel like if I move out, not that I'm saying I shouldn't... I feel like if I move out they're just going to rent the unit exactly the way it is without doing anything to it. And someone else, maybe an older lady or you know an older gentleman or someone with a baby might move in (Interviewee, 006)”.

This single mother who has gone without AC for three months describes how it impacts her son and how it causes bouts of fatigue.

“And, and, and I have a son's gonna be 14, you know. And, an, an- he wakes up in the middle of the night sometimes and these, because the air is so dry up here, and he wakes up with his nose is bleeding and it's just, it's not fair to my child and it's not fair to me... And, um, right now he's he's asleep, you know, and, and living in this, in this, uh, environment, like I, like I told you, it makes you very drowsy and sleepy. You just don't want to- you have no energy. I have to get up, just, just to, I've gotta push myself, to, you know, to do things (Interviewee, 011).”

While many tenants reported concerns with their HVAC systems more than half reported concerns with mold concerns related to water intrusion in their dwelling. Damp homes create the ideal environment for mold and fungi growth. The presence of damp environments is associated with upper respiratory symptoms, coughing, wheezing and asthma in sensitized person (Galson, 2009; IOM, 2000). The presence of mold is also associated with these symptoms but also is associated with the presence of hypersensitivity pneumonitis in susceptible persons (Galson, 2009; IOM, 2000). This tenant describes her experience after being exposed to mold, “ I was having labored breathing and I almost went in the hospital for it but I had to get out of the unit and once I got out of the unit and I wasn't breathing the, you know, the spores and everything I got better (Interviewee, 004)”. Other tenants explain how moisture problems coming from neighboring units caused problems within their unit, “It had flooded ... and the mold was coming into the apartment and making me sick (Interviewee, 017)”.

It was also common among participants to experience multiple housing deficiencies. This mother indicates exposure to asbestos released through the apartment ventilation system while also dealing with water damage to her unit. She describes how this impacted her family's health:

“The entire building was under, had water damage. That was ridiculous, to where you'd walk on the floor you could hear the water.... Everywhere and we were walking on water. They were confused as to how we could live there for a year and didn't fall through the apparent down stairs. Because it was so, there was so much water damage Every time my children went to the hospital, they got better at the hospital. Came home and got extremely sick. Um I gave them the information, I begged them to come in and umm do

testing on the apartment. They refused to do it for a month. And months and months. And basically they just tried to hide it.... They couldn't breathe. So not being able to breathe uh they are all now diagnosed with bronchitis and asthma. They're on breathing machines. They're better now that we left, but they were on breathing machines, they had to be hospitalized damn near every week (Interviewee, 001)".

The Institute of Medicine (IOM) report substantiates a causal relationship between environmental triggers, such as, cat allergens, cockroach allergens, house dust mites and environmental tobacco smoke with exacerbation of asthma sensitized individuals (IOM, 2000). However a more recent review of the literature indicates that exposure to cockroach allergens among non-sensitized children can exacerbate an attack (Kanchongkittiphon, Mendell, Gaffin, Wang, & Phipatanakul, 2015). Among those interviewed, 6 (35%) had serious concerns because of a cockroach infestation. This is how one tenant describes her experience, "This is like freaking nasty. I couldn't sleep they were like on my bed, on my headboard, in my dresser, in my clothes, and I was like I ended up throwing everything away (Interviewee, 008)". One tenant describes how a cockroach infestation occurred in her disabled son's apartment:

"Where we went through uh 3 refrigerators ... Well the first one was because the electrical went out and it knocked the compressor out when that happened. And then they uh gave us another refrigerator and it didn't seem to work properly and then they gave us the 3rd one and the 3rd one was infested with roaches when they brought it in. We did not have roaches what so ever. The apartment was kept clean at all times... When they brought that refrigerator in and it seriously gave an infestation in there that we just we can't get rid of But I don't have the money to move them and they don't either so we've been making do (Interviewee, 007)."

This mom continues to describe the difficulties in addressing the housing conditions for her paraplegic son:

"I started trying to get in a place there for my son because it's hard to find anywhere for him because of the wheelchair you know. He has to have enough clearance to get into the restroom and all that there's just a lot of factors that go into it for him.... So you know I have to have it cleared out, you know. And clean everything, has to be sterile and all that

for him. Because he has a real bad health condition right now, he has a wound on his butt, that there's no skin there you know he's getting uh home health for it every day.... There's been a lot of infestation and they even got in his pump that goes to his air bed and it caused it to stop working (Interviewee, 007)".

While the literature substantiates the health impact of cockroach exposure, it was evident that the impact was more than their physical presence but an emotional impact as well. One tenant describes her experience, "It is very dry in here and I am coughing all the time ... And then I got the cockroaches like crazy now because they like this environment. But the holes in the wall, he never, ever, fixed... There's holes in the wall, there's missing, uh, base plates, you know like, uh, like um, base plates to you, that means, like, outlet covers and such. So I put the, so I put, like, uh, tape over it. Because of cockroaches. I mean, I, I sleep on the floor. My son has a bed. In the living room. I sleep in my bedroom, and um, it's like, they, they, they, they wake me up. They crawl on me. It's very disturbing. I'm going through sheer hell, so to speak. Right now, because of my slumlord (Interviewee, 011)".

Bed bugs although do not cause human disease induce a similar reaction. As one tenant describes, "My daughter the oldest, the 11 year old, she was bitten on her face. So it was like it was like horrible... I just hate bugs and then once I found out they were bed bugs. ...Ohh no, it was it was horrible. I didn't want nothing, I didn't want none of my stuff.... Ya, just like the right for us to um to get help, when we are especially, if we losing everything (Interviewee, 005)".

Tenants reported health concerns such as asthma and respiratory issues; some reported health improvements after leaving the residence. However, what was even more poignant were the impacts on emotional and mental health of tenants renting in Clark County. One tenant shares how the chronic stress, she has been under, has affected her health:

“Because of the stress I got, I, I, I got shingles. I'm on the tail end of shingles... I thought I got bit all over ... you know like the back of my back. It was like, like, just like, like, little marks and they were itchy and they were painful. And I'm like wow, what am I, what do I have here. And then I went to doc- I went to, uh, I just took myself to emergency hospital and, and, they say "Yeah, well you've got shingles" (Interviewee, 011)”.

Other tenants describe the sense of losing hope and feeling as if they had failed as a parent.

One grandmother describes how she was concerned that CPS would get involved because her home was no condition for children to live in. She says, “Because they had already said that the place was not habitable to have a kid there... So we were afraid of that you know, we already knew we couldn't be there, but I didn't have the money just to move (Interviewee, 016).” Several families shared how they felt their home had been violated, “Oh God, I felt so just so like my safe haven. Like I was in a war zone my safe haven wasn't safe... I just felt so violated so oh I just cried myself to sleep every night... I knew that they were everywhere. I would just go in the kitchen there would be hundreds of them just everywhere (Interviewee, 015).” Another tenant describes her transition from homelessness to something less than standard:

“And so, basically, you know I mean, this is costing me, I mean, I can't afford to move. You know, I mean, went from homeless to home, which is this place. You know, I mean, my son and myself we were in a shelter, before, and that was a nightmare. So this is, you know, we're just, we're just, barely... this is our, our piece of mind, but then again it's not fair that I'm paying rent every month - on time - and not getting the services that I deserve (Interviewee, 011)”.

The qualitative interviews revealed the burden of housing in Clark County, particularly among those with a disability. Housing conditions can exacerbate injury as described in the tenant's experience:

“But no one is in that one now, still. Because the pest control guy said yeah they were coming out of the base board, they were horizontal vertical, they even came out of the smoke detector. They even threw out my smoke alarm and um because they were coming through it from the wall, through the detector, back to the wall crawling up and down it

was just in my refrigerator, in my stove, in my cupboards, in my shower, in my bed, in my tables, in my drawers oh it was just horrible I mean [inaudible]...I fell so many times in that apartment because um I was trying to move and get out of the way of the bugs and then trying to just get things back together you know to move into the bugless apartment. I fell, I fell 8-10 times at least in a matter of two weeks...Emotionally I mean I cried myself to sleep every night. I mean it was just horrible, I mean, just to see these bugs everywhere, in places that you never would think they could get or would want to be it was just unbelievable (Interviewee, 015)".

The quality of rental housing, the financial constraints for upward mobility combined with the health and emotional impacts of substandard housing have directly and indirectly impacted the health of renters in Clark County. While the main focus of this study was to examine the indoor environment some neighborhood characteristics were explored.

(2) Neighborhood Characteristics

This component of the study also aimed to examine what residents thought about their neighborhoods in terms of access to medical services, healthy foods, and transportation. Most participants felt like they had adequate access to medical services and healthy food choices. Two participants relied solely on public transportation as a means of getting around town for doctors, work, or school. However, several prevailing constructs evolved which included neighborhoods as a means of social support and ones plagued by crime and a lack of suitable amenities for children.

Ellen, Mijanovich, & Dillman (2001) indicate that neighborhoods can influence health in the short and long term. Short term effects on health encompass the attitudes, behaviors, and utilization of medical services and by long-term effects also known as "weathering". Weathering describes the accumulated effects of the internal and external environment that ties along with living under chronic stress, living in substandard housing and living in communities with limited investments (Ellen, Mijanovich, & Dillman, 2001). They suggest that this occurs through the

following pathways; resources within a given neighborhood; stresses in the physical environment; stresses in the social environment; and neighborhood based networks and norms. Although all four pathways evolved from the interviews three became distinctively important within the neighborhood context; social capital, crime, and community disinvestment.

Lang and Hornburg (1998) define social capital as “the stocks of social trust, norms, and networks that people can draw upon in order to solve common problems” (Lang & Hornburg, 1998). It functions to engage people within your neighborhood and to take part in group activities. It allows for the building of social networks, norms and providing social support. Several studies suggest that more disenfranchised communities in poorer and less empowered communities suffer from feelings of hopelessness and isolation (Braithwaite & Lythcott, 1998; Spence, 1993); such feelings and attitudes have been suggested to weaken one’s health (House & Landis, 241).

It was clear that most participants chose where to live based on both financial and social resources; circumventing the condition of the home and neighborhood. A widowed mother of seven describes why she chooses where she currently lives, “My family is over here. That is about it. I just want to be close to my family so I moved over here. So you know they can help me watch the kids while I work (Interviewee, 011)”. While others clearly acknowledge the lack of social support and networks being a great disadvantage. A widowed mother of one who had been previously homeless describes her circumstances, “I have, I mean, I have, I don't know anyone in this state but I don't know anyone here. And, that's a barrier for me for the fact that, I mean, if I was to move from point A to point B I have no one to help me, no one, no one whatsoever. So that is my barrier (Interviewee, 011)”.

Additionally it was clear that some participants had gained a sense of hopelessness and a sense of overall disinvestment in their communities. When asked what she would change about her neighborhood an expectant mother answered the following:

“I wouldn’t change anything I’d just leave. There’s so much crap going on over here. There’s fights, there’s gunshots, there’s people living in the apartments they’re selling drugs, there’s everything. And I just, I don’t like it, and I’d rather just leave. So you know like this area is just not gonna get better (Interviewee, 006)”.

Neighborhood crime can also have an impact on the health of its residences. Crime infested neighborhoods can increase the likelihood of injury (Ellen, Mijanovich, & Dillman, 2001); while other studies suggest that witnessing crime first-hand can lead to prolonged trauma (Evans, 1997). Additionally prolonged exposure to crime can lead to behavior changes that change the cost/benefits to certain behaviors; people feel “like they have less to loose” (Ellen, Mijanovich, & Dillman, 2001). For instance, long-term exposure to violence and crime can reduce someone’s perception to the risk of smoking, particularly when the effects of smoking are more long-term (Ellen, Mijanovich, & Dillman, 2001).

It was evident among the participants that crime was inherent in most of their neighborhoods. Most described themselves as trying to isolate themselves from the external problems of their neighborhoods. This tenant indicates, “Oh ya honey they had shooting and everything over there were I used to stay. They had like two shootings, kids fighting. I just go to work and come home. And I’m just like oh my gosh (Interviewee, 008)”. Another tenant describes the crime in her complex, “Someone just got broken into just a few apartments down from me and the dogs were beaten up because the people wanted to keep them quiet while they robbed them so you know. I hate to say that, but the shopping is convenient ...It’s a 24 hour city and I’m afraid to go out after dark (Interviewee, 015).”

Of all the interviews only one tenant described taking active approach to addressing the crime in her neighborhood. She keeps her window open at night because she has no working AC and it is the only way to keep her home cool. She shares her experience:

“I hear people in the middle of the night ... my window is facing that way and, uh, you know... People arguing and cussing, people fending for their lives. There’s been a couple times I’ve called 9-1-1 because I’m scared. Not, I mean, for someone else out there, not, not, I mean, not, not to hurt us. But, but, they need, they need some assistance, you know, perhaps. Gunshots and this, that, and the other thing. And death and, you know, and people committing suicide (Interviewee, 011).”

Other factors that can contribute to the health and safety of residences are what Ellen, Mijanovich, and Dillman (2001) describe as access to quality fire protection, sanitation and parks. Two participants were vocal about the lack of amenities available to children in their complex and neighborhood. A mother a seven describes the accessibility of her neighborhood to children, “You know there is a big empty lot that’s across the street. Big empty lot that is desert like You know they could put a park there. A community something, for these kids in this neighborhood (Interviewee, 010)”. While this mom describes what limited her children from being outside:

“Well it was just like, where we were living, it was just like really, really not suitable for kids, you know. And it had like people, you know, on drugs running around behind our apartment building and they was coming in and out of our apartment building early in the morning, late at night, all freaking of day. Like my kids outside playing and they couldn't play assuming there were drug dealers or drug people walking in and out. And then they have like rocks and stuff inside the courtyard. This was another complaint I had. They had rocks and stuff inside the courtyard. It wasn't really anything for the kids to do. So they complained about the kids throwing rocks, which I know is not right for them to be throwing rocks, but there was nothing else for them to do. They had nowhere to play (Interviewee, 013)”.

While neighborhood characteristics provided a broader picture of the macroenvironment in which tenants in Clark County live, an even more detailed look at the impact of substandard housing was identified through reports of housing displacement.

(3) Housing Displacement

Eviction was not the only form of displacement tenants encountered. Housing displacement took on various forms; breaking a lease before the terms of the lease by choice, leaving the rental through an eviction process, leaving a rental when the landlord agreed to an early termination of the lease, relocating to another unit within the same complex, homelessness or near homelessness. Within this theme several vulnerabilities were identified particularly among those who indicated they had bad credit or those who have a disability.

Much of the research to date on housing displacement or insecurity has been with residents in public housing and concerns of gentrification. Public housing redevelopment efforts that began in the 1990's focused on deconcentrating poverty among public housing residents that were considered in severe distress. Severe distress was defined as low income households, neighborhoods with high crime, problems with property management concerns and housing in physical distress (Goetz, 2010). Although studies evaluating displacement were public housing focused, much can still be learned about the impact of dislocating families within this context. The major difference between public housing residents and participants in this study was that public housing residents were typically relocated into mixed-income neighborhoods or redeveloped public housing sites; whereas the participants in this study typically made a lateral move in terms of housing and neighborhood; while others made what they thought as a downgrade from where they previously lived.

The battle between living in severe distress and understanding the lived experience of place continues on. Some authors suggest a dichotomy between defining ones experience based solely on housing conditions and not taking into consideration that people see where they live as a "community with problems" rather than "problem communities" (Manzo, Kleit, & Couch, 2008).

The idea of place attachment brings to fold the connection between people and place. It integrates the behavioral, cognitive and emotional connectedness with our environment and on the community level determines our connections with our community and our sense of embedded roots (Manzo, Kleit, & Couch, 2008). Although the present study did not seek to gain an in-depth assessment on place attachment, it was able to gain an understanding of the importance of place despite the present living conditions. As one participant describes, “I wasn’t trying to really leave. I was trying, you know, to get a solution you know to get these bugs out. Other than me having to move out of that home.... And so yeah, it was just too bad for me and my kids to live in (Interviewee, 003)”. Another participant felt in a similar way,

“Money was tight. And I was already like. Like when they emailed me back and said we rather have you move and will terminate your lease and give you back your deposit. I was like uh.. I was really really hoping that they would come in and take care of the issue. Because I didn’t feel like moving. I just moved. But I was like I’m not going to stay here with the roaches (Interviewee, 008)”.

Similar to literature published on public housing residents, relocation or displacement was considered a stressful process and more so among low-income families who do not have a fluid income to account for moving expenses (Keene & Geronimus, 2011). Only two of the 17 participants were let out of their lease by the landlord and despite being released from the contract they had to deal with the added expense of moving. As one participant describes, “And I was basically on my own. And I had to spend \$2,500 to move in there. I had to spend another \$2,500 to move out. And I’m a senior ok. On a fixed income so you’re looking at \$5,000 in three months (Interviewee, 002)”. Additionally some residents not only incurred the expense of moving, sometimes a month or a few months after their lease was signed, but also had to repurchase major belongings. As this mother describes the burden of having to purchase furniture after a bedbug infestation:

“Yeah it was just one month that we paid. We paid the rent, we paid deposit, we paid \$1,200 to get in there and we paid like one month rent and it was like just a waste of money.... We had to get rid of everything I didn’t want to keep anything...Yeah it was hard, we had to ask um um moneys. We had to ask for money. And it was it was really hard, just my husband works and then I also have a baby with a disability so it was really hard.... Ya I had to buy new beds for my babies, umm new mattresses, new beds for me, new dining table, um new sofas, it was it was devastating, it was really hard (Interviewee, 005)”.

This tenant describes her experience, “They don’t keep up the maintenance. They don’t keep up this and that. And it becomes a living condition for people. And then for people to leave they want you to break the lease. Then you have to pay all this amount of money just to break the lease just because they don’t want to do their job. It’s its hard. It becomes stressful. Like moving and carrying all that stuff is stressful. When you have people that don’t do their job (Interviewee, 008)”.

It was common among the group of participants to leave the lease before it terminated because they were unwilling to continue dealing with the conditions of their home. Some reported living in a hotel as they transitioned into a new place to avoid homelessness, others would stay at people’s houses to avoid being in their home, others faced homelessness straight on, and some chose to leave the state all together. This participant describes her decision to leave after her credit and court appearance prevented her from moving elsewhere:

“Because when you have a judgment against you, umm whether you win or lose and try to move into another place. The other apartment or wherever you’re trying to move into is going to look at you like a red flag. Like that’s a red flag. That’s one thing. Soo, yeah so that’s what happened and so we ended up coming to California, because we were unable to find anywhere else to live. Umm, and I had a job and all that, and I had to leave my job, had to leave Las Vegas. Put whatever I had in my open storage, throw everything else away (Interviewee, 001).”

Through data analysis two distinct vulnerabilities were identified in the housing displacement process particularly among those who have bad credit and those who have a disability. This participant describes her frustration with having to leave her place because of its

conditions and the limitation of alternative choices to live, "... before that I lived in another unit, I know you called me for this unit but what I'm tried to say I didn't know what to do. There was water leaking and my clothing got wet and everything. They told just to put buckets in there... A lot of people go through this because they have less than perfect credit and you feel that you cannot, you know, that there's no other place that could open doors to you (Interviewee, 016)". Additionally, this participant describes the challenges in being placed into a different unit within the complex but is limited by her disability and the apartment is not accessible for those with a disability.

"Disability friendly because of um the way that it was set up and everything and I said to them they said "well is this gonna do" and I said well I don't have a choice this is the only one you have available. And what was really horrible was all the money that was literally cost and wasted. My dad flew out from Massachusetts to come here cause I'm disabled. So he rented some, he hired someone to pack and move me and then unpack so we get everything situated then find out we have to move again. So by then my dad had to go back. So they had some of their um maintenance guys move me, it was just like a couple hundred yards across the way. So a lot of my things are broken. I mean I'm glad they were there to move me but the packers that my dad hired was basically almost for nothing in a way because you know they didn't move me again. So now I'm surrounded by boxes. Because I can't unpack. And what sucks is that I don't have anyone to unpack for me now. (Interviewee, 015)".

(4) Housing Resolution & Remediation

The current body of literature that evaluates housing resolution and remediation work is directly related to intervention studies aimed at improving housing conditions in order to improve health. To date only one study was found to discuss landlord-tenant dynamic while documenting housing conditions through qualitative analysis. Grineski & Hernandez (2010) found that landlords took advantage of vulnerable households by not maintaining their properties, which ultimately influenced how parents managed their children's asthma health. They also found changes to their rental were barred by the unwillingness of the landlord to make the changes, unwillingness of the

landlord to allow the tenant to make changes or the landlord passing on the financial cost for the changes (Grineski & Hernandez, 2010). To date no research was identified to review the adequacy of housing repairs by the landlord. Within this study several constructs developed and included endless reports remedial repairs and those who attempted to remediate or mitigate hazards themselves. Tenant reports identified how resolutions were limited or stagnated particularly among persons with a disability.

Remedial repairs often referred to as “mickey mouse” job was reported among almost all participants in the qualitative interviews. Remedial repairs included less than ideal housing remediation, resolutions, or fixes that are described as patch ups, covering with spackle, and painting over mold. This is how a tenant describes how her housing issues were addressed, “But uh a lot of these apartments they just want your money, your money, your money, and the repairs ok they’ll just do a little mickey mouse and just leave. They don’t even fix sometimes the air conditioning and that’s a big huge thing over here in Vegas. The air and those things are bad right now because of this weather (Interviewee, 016)”. This tenant describes how improper fixing lead to mold exposure over time:

“When he renovated the apartment there was a new window put in the bedroom and every time it rained there was a little crack that was not caulked correctly and it was causing water to come in to the apartment from there. So right on my window sill down there was a huge water pocket on the sheet rock and it created mold over time... That my my landlord said oh its fine. Its repaired by just putting spackle on the wall.... But you know that’s were my issue was its like ok here me and my husband were both getting sick from your negligence. In fact you knew about a year ago. And your still telling me to my face that there is no mold in the apartment when you can physically, when you can smell it when you walk in the room. You smell the mold and the moisture (Interviewee, 004)”.

The adequacy of how housing deficiencies are resolved is an important point to consider. This participant’s testimonial indicates how spraying without sealing entry points did not address her cockroach concerns:

“They did address the problem. They came out and sprayed like three times within a week and a half. And it never got fixed because it wasn’t like they were just coming in from outside they were coming through my shower, in my sinks, and vents. So when I explained that to them and said that the spray didn’t work they were like well there’s other methods we could try within a couple of weeks (Interviewee, 014)”.

Other tenants tried to resolve some of their housing concerns on their own; particularly among tenants who were dealing with cockroach infestations. Some tenants implemented rigorous cleaning methods, using boric acid, foggers and roach traps to deal with the roach infestations. The following tenant describes how trying to fix her roach problem resulted in a trip to the hospital:

“Me and my kids ended up in the hospital because I’m doing so much cleaning and at home, you know, making sure that filth wasn’t one of the reasons why roaches were in that home. And you know I ended up setting off a ammonia gas, uhh in my home because im cleaning it with bleach, pinsol, [inaudible] and of course ammonia. And so that caused me and my kids to go into the hospital. Because I did set off ammonia gas trying to clean out these roaches from the home.... I wanted to make sure, filth wasn’t a problem for me and my children. So I set off the ammonia gas trying to clean that house so good.... Something should never has happened in the first place.... Like I was really having a hard time breathing from the ammonia gas that was set off. So my lungs, were like, I felt like my lungs where claspng on me cause I couldn’t breathe. And my two year old was coughing and choking up so bad I couldn’t just couldn’t stand to sit there for another hour in that home (Interviewee, 003)”.

This mother who oversees the care of her disabled son describes how she tries to address his roach infestation using a fogger because not enough was being done to address the problem.

She also reveals challenges to address the roach infestation due to her son’s disability:

“So I had tore the carpet out myself just recently and I fogged the apartment myself and had it exterminated ... And and still I need to have it exterminated again. On my income and at my expense. Because when they sent Terminex out there... All they did was spray a little bit in the kitchen uh on the base boards and that’s all. You know, I mean I thoroughly went, I moved the refrigerator out after I fogged. You should have seen there was like thousands of them trying to get out the door... I’ve tried to make it best as I can for them over there to live. You know, its not as bad as it was, its better. But it’s just they are still there and we can’t get rid of them. I think we’re going to have to bomb again.... They don’t unless you ask. And there’s only a certain day of the week and a certain time

they do it. And my son is there so you know. It's it's a difficult. I took him out of the house to have the fogging done and I even told that with the 1st management. If I knew ahead of time we could schedule and do it. You know I could take my son taken out of the house, for maybe 4 hours or something but for all night I couldn't... The first management was just swearing up and down that he could not be in the house until the next morning, you know, we could not do that. And it was not the case with this fogging stuff. It says only 2 hours that you had to be out of the house so..... You know because of his condition he has to be on an airbed you know I couldn't just take him to a motel (Interviewee, 007)".

Another tenant describes the complexities of dealing with improper repairs and having children in the home. The inadequacy of the repairs results in her having to use an oven to heat her home.

"They were like that at first and then they took them out and they were putting new air conditions in all the while we were in the house and my 2-week old baby in there, and all this dust and all this stuff flying around and then when they finally put the new air conditionings... they didn't even know nothing about so they wasn't even fixed right. So it ended up causing me a lot of stress because bills- my light bill kept going up. When it's starting to get cold, you know, I had to use my, uh, oven to warm the house up for my baby. Like you know. It was just a lot. So like you know, them being owners out of state, you should come at least twice a month to check out your apartment, you know. Make sure everything is fine (Interviewee, 013)".

She continues to describe the trade-offs of exposing her children to harsh chemicals and finding herself homeless:

"And so then the manager, he decides to uh send, uh, the uh, bug man out to spray and he didn't, um. And I kept asking myself if it was fine for my kids to be in here while he's spraying that. He said yeah, "It's kid proof". But then my kids started getting sick, you know, and stuff like that.... All he did was come and he sprayed, and he sprayed some strong chemical stuff and he told us we had to be out for a couple of hours but we had nowhere that we could go. So we had to just sit outside in the yard for a couple hours then when we went back in it was still kinda strong you know? The smell was still strong, it was still too strong for my kids but I kept telling him, you know, and then so when I told him that I wasn't gonna let the bug man come and spray anymore and they said they were gonna put me out if I didn't let them come and spray. And I was well I refuse to have them come in and spray- I have my babies in here- and its too much chemicals for my kids. So I ended

up just having to have to let him come in and spray anyway because I didn't want to get put out, you know, and not have anywhere to go for my kids (Interviewee, 013)”.

This tenant describes her inability to comply with the pest control due to her disability.

“And then the bug bombs that they use the chemical my doctors, my care doctor, said absolutely not is she allowed to be subjected or around those chemicals. So they just kept wanting to bug bomb and then when the bug bomb guy got there they said um, you didn't prepare your apartment. You have to do this, do that, I can't even do that physically so basically it keeps going like a domino effect. They should definitely have in there what it entails. If there are bugs what happens what are the steps to that, you know, protects the renter (Interviewee, 015).”

(5) Current Effectiveness of Correcting Housing Deficiencies

There was a dearth of literature available to examine what is known about the effectiveness of landlord-tenant hotline model as a means to correcting housing deficiencies within jurisdictions in the U.S. Only one study conducted by White and McGrath (2012) compared the effectiveness of two inspection models; a complainant driven model and an enhanced model as a means of addressing housing disparities. Within this study it was apparent that current effectiveness at addressing housing concerns were within the constructs of how effective the landlord-tenant hotline is at addressing housing deficiency, how well legal recourses in Clark County were in assisting in the landlord-tenant dynamic, and lastly the landlord's cooperation in addressing housing concerns. It was also evident through the interviews that not all landlords shunned away from their responsibilities to correct housing concerns, but overwhelmingly this was not the case for most of the families interviewed. Through the interview process some concerns of bad business practices came up and are discussed further below.

The majority of participants found the landlord tenant hotline as a viable resource to understand their rights and understand how to go about making a complaint. This tenant describes what perpetuated her call into the hotline, “Like the only thing I kept doing was going in there kind

of complaining to her, like what's going on with this apartment? You know I put in work orders, uhh I'm not getting any results. So definitely, when I called the hotline. They kinda went in like thoroughly like literally, what I'm going to do, how to go about doing it. So basically, I just kind, of followed instructions. Umm, you know covering my butt. I put in my fourteen day notice (Interviewee, 003)". This tenant describes how she made use of the hotline and describes some of her challenges, "And a lot of times we don't know what places to call to try to get the right help. I didn't know what to do then over there. I knew about the letters but I just didn't have a plan. She took advantage of me because she knew I was single and you know I didn't have a plan you know. By the time I get off from work I work 8-5 and I go to college from 6-10 by that time the post office is already closed. I work on Saturday its kind of hard to get to the post office to get a certified letter (Interviewee, 016)".

Although the landlord-tenant hotline serves as an initial point of contact that people found helpful, most participants acknowledged its limitations. One tenant indicates, "Um, somewhat but they really couldn't do anything for the situation. Uhm, they just like told me kind of how to go about it (Interviewee, 012)". While another describes the following:

"They tried but their hands are tied. They can't. The pilot program can't do anything, but come and look and put down on paper. They can't stop these people. They can't assist you with anything else. So you know as far as being helpful. Yes they came out and looked and they couldn't help ... Because the tenant's thing did nothing to help me. And then you guys came out and apparently that's all you can do. You couldn't do anything. I wanted it shut done because each unit on both sides of me. They can't rent it. It's against the law to rent it. Its mold infested. And I was right in the center and you guys wouldn't help me any further, neither the health district, neither would the code enforcers. I.. Nobody will shut these people down. They are going to rent that place to a family that will end up getting sick (Interviewee, 002)".

It was evident through the interviews that the limitations of the landlord-tenant hotline were largely because of a lack of enforcement authority by the Southern Nevada Health District. This

participant describes her use of the hotline and how it can be improved to service the needs of renters in Clark County, NV:

“Umm I mean you guys stay on it and uh the health department came out, but the health department again, they didn’t they didn’t do anything they just documented it.... I would say get more involved... have more uh, more of a role. Than just saying oh you know we are sorry to hear that. This is some of things to do. Sometimes it’s better when agencies step in on behalf of the family rather than thinking they can fight their own fights ... (inaudible) ...Or something like that. Instead of just giving advice and telling a family member what they could do. Actually when they say they need more help and the landlord isn’t doing anything. Give them a call. And say you know we are calling in behalf of this family member, we are concerned with their issue. Actually be a liaison between the family and the landlord or whoever they are dealing with and the family (Interviewee, 001)”.

The following participant acknowledges the need for enforcement policy:

“The only problem is the the when it pertains to my situation with mold there is no strict regulation on how they repair it Uhm they they informed me on what my rights were as a tenant you know how to go about uhm you know you know telling the landlord what needed done and everything like that..... Uhm the issue is there is no regulation saying the landlord has to get this certified mold removed by a mold tester. Before he can say hey it’s done its clean and put the wall back together. He didn’t even want to tear the wall apart. You know so that’s where my issue is there for things of that nature, where there’s mold or some other uhm airborne something that can go airborne and cause a lot of respiratory issues (Interviewee, 004)”.

Another alternative for Clark County residents is to seek assistance through the court system.

In Clark County, residents can file a civil claim against their landlord with the help of the Legal Aid Center of Southern Nevada and Nevada Legal Services. Not all callers who participated in the study contacted either agency but among those who did some found it helpful while other felt it as another limited resource. Among those who found it helpful they found that it aided them in dealing with 5-day notices and serving paperwork. However, others found legal recourses to be frustrating. This tenant describes her experience within the court system:

“Ya and that’s joke. That’s really a freaking joke. Ya. You wait until they call you when they call you back they tell you ohhh that it’s a civil suit. You’ll have to go small, file a small claims that’s a civil suit. We don’t take civil suit. End of story... The renters need to have rights and they do have rights but there is no one to help them exercise these rights... So see that is where the system is broken. They don’t care about the tenants. They care about the landlords. That’s where it’s broken. Severely broken (Interviewee, 002)”.

Another tenant expresses her frustration, “Someone has to step up, you know, the court has to step up more, you know, to, to, address the situations that people are going through. So, so if- if there's a way that it's like when I went to the court and filled out all that paperwork and everything. I felt like it was for nothing. It didn't mean anything to anyone... And that I meant nothing to no one in the court system. It was, it was, a waste time! (Interviewee, 011)”.

Several tenants also sought private legal services. One single mother who works during the day and attends school at night found that trying to get to Nevada Legal Services during business hours impossible. She describes her experience with seeking private counsel, “I went to the pre-paid legal or something like that and I didn’t get no help there. You know \$450 dollars if I wanted to file the papers. So a lot of times its just the money that gets in the way or people not being able to fill forms (Interviewee, 016)”. Another tenant describes, “I tried like fighting them on it. Uhm tried to find a lawyer nobody wanted to take my case... I contacted so many lawyers neither they wouldn’t uhm, return my voicemails, I couldn’t get a hold of them, or I get a hold of them and they didn’t take mold cases anymore. Or just like literally no one wants to take mold cases in Nevada. Pretty much (Interviewee, 012)”.

As stated before, not all landlords evaded correcting housing concerns that were found, but reports of bad business practices were identified through the interview process. Some tenants reported landlords refusing certified letters and lease practices that seem unfair. One tenant reported that in her lease the identification of mold in her apartment was deemed her fault, while

others did not explain cancellation fees or assessed a fee to tenants if they were not home during a service call. Additionally, the adequacy of housing resolutions appears to be something that needs to be addressed. As this tenant describes, “And my apartment sent their own people out to look at it and basically he was like, oh this is nothing and then like, and then that counts as like them doing something so the health department said well technically they don’t have the right to come out cause they technically did something (Interviewee, 012)”.

Lastly one additional concern that arose regarding the effectiveness of addressing housing complaints was the issue with properties owned by persons out of the state. This tenant describes how this becomes an issue for her:

“So we suffered like a whole lot as far as being up in there and my manager not doing what he's supposed to do and then he’s like still- he's still at that apartment- he still has that apartment and the owner that owns that property doesn't even live out there, he lives in California. So he barely comes to check on his property to even know what's going on. He have other people that he has that comes and picks up the rent and stuff like that and they tell us to leave everything on the back line and they'll check it off the back line, like this and this and this off the back line. I leave it on the back line but they don't ever come or check or call us or anything like that (Interviewee, 013)”.

(6) Policy Recommendations

A series of questions were asked to understand how renters felt about Rental Housing Policy that would give the Southern Nevada Health District enforcement authority over rental housing; specifically how they felt about proposed policy and the potential benefits or cons to implementation. For some participants there was a clear disconnect in connecting their current housing conditions to the implications of housing policy. Some were clearly frustrated with the process or in the middle of displacement that engagement in a discussion about addressing problems in the future was of little concern. When asked how we could do things better one tenant

responded “I don’t know, if I knew I wouldn’t be paying this stupid fee...It would just help me, help them get like the apartment not able to screw me over. Cause basically they can charge whatever and if I can’t sue them I just have to pay it or they send it to my credit (Interviewee, 012)”.

However, of those who provided feedback regarding the possible implementation of rental housing policy no one expressed any concerns to have having a policy and all indicated some degree of need. All participants wanted a safe and healthy place to live in and expressed wanting accountability among “slum” landlords. One tenant indicated the need to widely advertise about the landlord-tenant hotline because so many people were in need. This tenant describes her frustration with the current lack of policy, “I would just say that the landlord should be able to abide by the, you what know I mean, like like the Nevada State Laws. They should be able to for me to pay my rent and everything for me to abide by as a tenant. And also the rules should apply to the landlord and also that the landlord should abide by the, and the landlord should also abide by the rules, you know. Where it says that your place should be habitable for you to live. You know like I said I complied with the lease agreement but they didn’t comply with their end (Interviewee, 016)”. This tenant describes why he feels we need policy:

“Personally that would be great because uhm not only for me but I actually know someone that has been renting a home with no AC right now and it’s a home not an apartment. So you could imagine how hot it is right now in that house. And she’s only running one window unit in one room just to be able to sustain you know living in it right now. And I think it’s unfair that the landlord is refusing to fix the AC and she she can’t afford to fix it. So what is there to protect her as a tenant? Cause if she breaks her lease then that just you know can hurt her even more. (Interviewee, 004)”.

Tenants expressed several avenues for recommendations to improve current rental housing conditions that could be used to guide current policy recommendation. One tenant indicated the

following to be important, “Guidelines. Guidelines on, uhh, you are supposed disclose any prior leaks. Major leaks. Any issues with the unit. And they don’t do that. And if they don’t and you find out. They should face a fine. Because that is the law. They are supposed to expose I mean disclose anything that was prior wrong with the unit (Interviewee, 003).” Additional recommendations included devising a fee structure for landlords who violate Nevada Revised Statute (NRS) (NRS § 118A). This tenant suggests, “If they had the right to basically ticket a manager or company that’s not doing what they’re supposed to for renters; they should be fined so much money per unit that’s not like for apartment or unit whatever that’s not working properly. Because then they would know like oh, it’ll save me money to fix the apartment than to get ticketed every month. And I think ... that would be better like if they were able to be fined or something was to happen to where it would cost them more money to pay what or to do whatever than to pay to fix the unit. I think that would make it so much better (Interviewee, 006)”.

Several tenants suggested the importance of a third party inspection process. This tenant expressed what would be important in rental housing policy:

“I guess anything that can cause health issues or you know cause any harm to anyone in the house whether they are asthmatic, diabetic, you know elderly uhm anything like that whether its mold uh the AC broke, uh plumbing I mean any of those issues are even electrical. You know those type of things all need to be within regulation. In fact if you ask me any house or apartment that needs that ... I think it needs to pass an inspection not only by the health district but by a certified building inspector before it goes on the market (Interviewee, 004).”

Another tenant also agreed that an inspection process should be implemented and should specify who is responsible to pay for such expenses. She describes what she thinks is important:

“I think they should do like two inspections before they can even rent it out. That way it will save people a waste of time and it will save them you know hundreds of dollars on deposits, getting your power transferred, by having to move and then turn around and move

right back out. Because whoever was there before me the lady only stayed two months because of the roaches ... They have to pay for pest control to come out or someone to come out and spray that would be a rule in there to. They need to pay for it. Because it's expensive. That was like \$50 a month. I don't got that kind of money (Interviewee, 008)".

It was important among renters that a standard of living be upheld. Furthermore renters indicated the importance of inspections and repairs be complete by someone qualified to do them.

The overarching construct that developed during the interviews was that renters needed a third party to step in and be the liaison between them and a landlord unwilling to comply with NRS § 118A. As one tenant describes, "I mean it would be nice for, you know what I mean, for somebody to step in you know. Nevada doesn't protect us. They protect them and are always whining about money or everything like that. But um when it counts actually about the people you know what I mean... The people that live in our areas, people that live in those areas and stuff, um, you know, they don't do anything. I wish there were laws and everything should be implemented for, you know what I mean, for landlords and for renters and everything else so they can find their way (Interviewee, 016)". This tenant describes

"Well like when it's a situation where the apartment is possibly uninhabitable do to either health risk or even if it's something to do with the landlord neglecting uhm you know repairs even if it's down to the ac something of that nature. We need to have some sort of third party you know the health district or whomever would be part of that to say hey you know this this dwelling is not inhabitable for your tenant. You know if you don't fix this within a sort of amount of time we are going to allow your tenant to either hire someone or their going to get out of the lease. You know something of that nature. I don't know what kind of regulations that needs to happen to do that, but uhm you now im im worked in hotels and I've seen the health district come in and visit and inspect our rooms in the hotel before. So you know I don't understand why I can't have that as a tenant because you know I ended up almost in the hospital from this mold (Interviewee, 004)."

Current policy (NRS § 118A) only allows for the early termination of a lease if it is due to health circumstances for those older than 65. One tenant describes the need for lease agreements

that are fair and a policy that considers early termination for health reasons. She states it is important for her to, “Just making sure that the landlords have to like specifically state all policies and what it would actually cost things like that. As well as, uhmm, giving the the tenants more options for emergency cases or difficult cases. Like it’s one thing if I just said oh I don’t like this apartment I want to move. It’s another for me to tell you that I don’t feel safe the fact that you have to send a letter to tell me it’s not safe in my neighborhood as well as having allergy issues and things like that and you not be able to accommodate that in a better manner (Interviewee, 014).”

Since the majority of our participants had to undergo some form of displacement, policy recommendations should include providing an “equivalent” rental. This tenant shares why this is important to her:

“I should have gotten free rent or you know gotten free compensation back. And then put me in another equivalent apartment. They did but it has steps so its really not equivalent. And at one point they were going to move me into the, um what do you call it, the model unit and said put all your stuff in storage. I said I can’t even pack I didn’t have the money to get somebody and a storage unit, and this and that, I mean they were just crazy. They even said there might be bed bugs in this property. I’m like OMG so I guess I don’t know I don’t really know how to word it so just some way um to where you don’t have to have your safety violated by insects (Interviewee, 015)”.

Summary of Findings

Using a phenomenological approach to better understand the lived experience among renters in Clark County allowed this HIA identified specific vulnerabilities and practices that can negatively impact the health of our residents. A summary of the findings are in Table 24. The interviews suggest that current resources to address rental housing concerns are not adequately meeting the needs of our families.

Table 24. Summary of qualitative findings by themes

Findings
<i>Housing & Health</i> <ul style="list-style-type: none">• Tenants reported going without heating and cooling systems for extended periods of time, as well as, problems with water intrusion, mold, cockroaches, bed bugs and other general maintenance including the lack of functional appliances• Tenants had concerns about asthma particularly among their children• Tenants with a disability & those with bad credit bore a greater burden in trying to address their housing concerns and/or moving• The impact on health included a very real emotional component that involved periods of hopelessness, chronic stress, feelings of failure as a parent, fear of homelessness, or a sense that their homes have been violated or feeling like they are “going through hell”
<i>Neighborhood</i> <ul style="list-style-type: none">• Crime was the most common theme prevalent among those interviewed• Tenants indicated the importance of social support• Tenants felt a sense of community disinvestment from a lack amenities particularly for children in the neighborhood
<i>Housing Displacement</i> <ul style="list-style-type: none">• Tenants have to contend with various forms of displacement<ul style="list-style-type: none">• breaking a lease before the terms of the lease by choice• leaving the rental through an eviction process• leaving a rental when the landlord agreed to an early termination of the lease• relocating to another unit within the same complex• homelessness or near homelessness
<i>Housing Resolution/Remediation</i> <ul style="list-style-type: none">• Tenants discussed the need for proper remediation to avoid remedial “Mickey Mouse” repairs• Tenants would try to address roach infestations with vigorous cleaning methods, foggers, & the use boric acid which under some circumstances impacted their health• One tenant reported the use of her oven to heat her home due to inadequate repairs on her HVAC system
<i>Current Effectiveness of Correcting Housing Deficiencies</i> <ul style="list-style-type: none">• Tenants felt the landlord-tenant hotline was helpful in providing information but constrained in what they could do• The adequacy of addressing housing concerns needs to be addressed; per NRS landlords have to make their “best effort” to correct the problem• Tenants felt the need for a liaison between them and their landlord; particularly to enforce habitability concerns
<i>Policy Recommendations</i> <ul style="list-style-type: none">• All tenants felt that the need for policy to assist in fixing their homes. They suggest the need for fines, inspection and for inspections to be conducted by qualified personnel• Other suggestions included disclosure of prior habitability issues with the unit and ability to terminate the lease due to health concerns

The current landlord tenant hotline model has served as a resource for families to initiate an initial complaint; the limited number of follow-up visits by the health district aided in the resolution of some complaints, but as found through the qualitative process that lack of enforcement authority limits the ability to provide the assistance our families need. Families are being subjected to poor housing conditions; high levels of stress; different forms of displacement which lead to inability to build place attachments and social capital which can be protective (Elliott & Williams, 2002); crime; community disinvestment; and financial burdens.

CHAPTER 5: DISCUSSION & RECOMMENDATIONS

What sets apart an HIA from other forms of assessment is the consideration of health, social determinants and social justice (Bhatia, 2011; Quigley, et al., 2006). This HIA aimed to augment previous research that categorized rental housing conditions in Clark County by incorporating the process of identifying inequities to best inform Rental Housing Policy (RHP) and to mitigate unintended health consequences that may disproportionately burden already marginalized and disadvantaged communities. Building upon work conducted several years ago under a strategic planning grant, a rapid HIA was conducted using a mixed-methods approach to identify inequities in housing, characterize asthma health of Nevada residents and through qualitative interviews better understand housing conditions, health impacts and the need for RHP through the lived experiences of renters in Clark County, Nevada. Recommendations for this HIA were formulated and informed by the qualitative and quantitative analysis, as well as, the literature on housing and health.

This study aimed to understand housing inequities within the population of Clark County. A significant relationship between those who make less than 80% of the median income and reporting an essential service complaint; which indicates that lower-income families are disproportionately lacking power, water, gas or ability to heat or cool their home. A review of all calls made into the hotline indicate a total of 2,126 out of 2,861 calls came from ZIP codes below 80% of median income, accounting for almost three quarters of the calls; Representing areas in Clark County with higher concentrations of ethnic minorities and families living in poverty (SNHD, 2012). From 2000 to 2010 poverty rates have increased from 10.8% to 15.1% among all ages in Clark County and among families with children under the age of 18 poverty rates have gone from 14.6% to 22.8% for the same time period (SNHD, 2012). The findings substantiate what

has been published in the literature revealing inequities in housing condition among lower income communities (Grineski & Hernandez, 2010; White & McGrath, 2012).

This study also examined differences in the resolution of a housing deficiency by income. Based on the limited literature available indicating that lower-income communities may have more difficulties in having a housing complaint addressed it was hypothesized that there would be a relationship between those less than 80% of median income and not having their deficiencies corrected. Data analysis indicated no significant relationship between income and resolution of a housing deficiency. However, it is possible that a subset of the population with housing problems is not captured within the population who contacted the landlord-tenant hotline; thus subject to some bias since the sample is representative of a convenient sample. Grineski and Hernandez (2010) indicate in their analysis that renters, particularly those that are not native-born, are less likely to have their housing deficiencies corrected because they are less likely to make a complaint for fear of eviction and/or deportation. Since no demographic data were collected the study is limited in making inferences about the population that contacted the landlord-tenant hotline. However, given the number of immigrant populations in Clark County, consideration should be taken to address the housing conditions among immigrant communities. Clark County has ranked 4th in the largest absolute growth in immigrants among U.S. counties (Wright, Tuman, & Stevenson, 2011). White & McGrath (2012) found that among low-income families several barriers impede them from making a complaint and often reside from fears of retaliation via eviction, increasing the rent or intimidation (White & McGrath, 2012). The literature indicates that further analysis is warranted to capture vulnerable subpopulations not identified in this study.

The qualitative process revealed that tenants in Clark County have to contend with poor housing, improper repairs, crime and in some instances a sense of community disinvestment.

Tenants reported concerns with water intrusion, going without heating and cooling systems, mold, cockroaches, bed bugs and other general maintenance issues. Some tenants who had non-responsive landlords attempted to address roach-infestations with the use of foggers and harsh chemicals and in one instance resulted into a hospital visit because the cleaners released high concentrations of ammonia gas. Many reported what was often referred to as “Mickey Mouse” repairs by the landlord in which remedial work was done to defer the cost of proper maintenance. The qualitative analysis also identified the need to integrate an educational component for tenants and landlord which is also substantiated by other studies which have reported that a multifaceted approach works best to improve housing condition and health. One of those components include behavioral modification. Tenants need to understand how to reduce hazards in their home, such as, pest and VOC’s. On the other hand, landlords need to understand the connection between health and the timeliness and adequacy of repairs (White & McGrath, 2012). Of those interviewed with a pest infestation not one indicated the use or implementation of integrated pest management techniques. It appears that landlords are highly reliant on traditional pest management techniques that don’t appear to be effective.

It was anticipated that some of the participants would probably have experienced being evicted from their residences from the time that they contacted the landlord-tenant hotline and the time of their interview. However true, through the interview process it was clear that housing displacement was more than just being evicted from a home. Housing displacement took on various forms; breaking a lease before the terms of the lease by choice, leaving the rental through an eviction process, leaving a rental when the landlord agreed to an early termination of the lease, relocating to another unit within the same complex, homelessness or near homelessness. The various forms of displacement resulted in physical, emotional and financial burdens. It was evident

that many difficulties arise from being displaced from one's home and included making housing trade-offs. Many tenants chose to break their lease and deal with the financial repercussion of moving and often times impacting their credit score leaving a mark on their credit. While others simply chose to remain where they were living because the financial burden to move was beyond their financial capacity and in some instances beyond their physical capacity, particularly among those with a disability.

Secondary analysis of the landlord-tenant hotline data did not offer the opportunity to connect health impacts to housing deficiencies since no health indicators were collected. However, since the literature substantiates asthma as a significant health outcome to poor housing, this HIA aimed to characterize differences in asthma attack or episode among renters and owners and examine if the number of environmental triggers were predicative of an asthma episode or attack. The data suggest a 25% increase in experiencing an asthma episode or attack among those who have more than six environmental asthma triggers in the home compared to those who report one to two triggers and a 12% increase among those who report three to five triggers in the home compared to those who report one to two triggers. Housing tenure data and asthma attack/episode suggest a 21% increase of having an asthma episode or attack among renters. However, all three regression models did not reach statistical significance.

It is possible that some effects are masked by comorbidity with other respiratory conditions and/or current smoking status, which should be taken into consideration when collecting adult asthma data in the future. Although the core BRFSS module is collected through a random selection process, the asthma call-back survey are calls made to persons who have agreed to a follow-up call which can represent some bias. The asthma models used in this analysis were approaching significance and warrant further investigation. However there are some limitations to

the study design. All triggers were entered into the regression model as having an equal effect. Future analysis may warrant introducing asthma triggers based what has been found by the updated IOM report regarding exposures that are causative or associative in nature to developing or exacerbating an asthma attack. Overall, the BRFSS data suggest that more research is needed to understand the impact of environmental triggers on adult asthma health in Nevada.

Although the adult asthma call-back survey data did not reach statistical significance, other data collected in the state provide a picture of asthma health in Nevada. According to statewide data collected via the Nevada Youth Risk Behavior Survey completed in 2013 a quarter (n=865) of high-school students, ages 14-18, indicated they had asthma (NSACP, 2014). When broken down by demographic variables, such as race and ethnicity, higher rates of asthma are reported by American Indians (45.4%), Black/African Americans (30.2%), other/multiple races (31.1%), and lower among Asians (23.7%), Whites (24.25%) and Hispanic/Latinos (20.4%) (NSACP, 2014). Examining the same data by county, rural and frontier areas had higher rates of asthma, with some counties reporting as high as 30%. Comparing the two most populated areas of the state Clark County (25.3%) high school students report more asthma compared to Washoe County (17.8%).

Data from the 2013 and 2014 Nevada BRFSS indicates that 12.4% of Nevada children report lifetime asthma, 13.8% of which are located in Clark County and over 7% have a current asthma diagnosis of which 8.2% live in Clark County (BRFSS, 2014). In 2011, Clark County reported 20 deaths due to asthma as the primary cause of death and over 10,000 inpatient hospital stays (NSACP, 2014). Of those admitted to the hospital the most susceptible group appear to be the elderly (25%) and children ages 5-14 (20%). The median length of stay was two days and at a median cost of \$23,205 (NSACP, 2014). In Nevada, a greater burden of lifetime asthma is among those whose household income is \$35,000-\$49,999 with a prevalence of 14.4%, followed by those

who make less than \$15,000 with a prevalence of 13.4% and then those who make between \$15,000-\$24,999 with a prevalence of 12.8%.

The literature substantiates that respiratory health is the most prevalent health condition related to housing (Galson, 2009). Asthma incidence, prevalence and hospitalization rates in the United States are disproportionately high in poor communities and the highest rates are seen among poor minority children. Research has demonstrated that childhood asthma prevalence in certain low-income minority neighborhoods to be as high as 23%, almost 4 times the national average (Rauh, Landrigan, & Claudio, 2008). Despite higher rates in asthma morbidity among low income minority communities the literature suggest that housing interventions that incorporate a holistic approach to address housing deficiencies can improve asthma morbidity (Atherly, 2011; Crocker, et al., 2011; Krieger, et al., 2010), particularly in children and adolescents (Crocker, et al., 2011). Multicomponent strategies have shown to improve asthma health, which may include multifaceted and tailored interventions, cockroach control through integrated pest management, and elimination of moisture intrusion and leaks and moldy areas (Krieger, et al., 2010). Multicomponent interventions have also been found to reduce asthma morbidity at cost benefit ratios of 5.3-14.0 and a cost-effectiveness ratio of \$12-\$57 per asthma symptom free day (Nurmagambetov, et al., 2011). Thus, a housing based policy that integrates a standard for housing and education can be effective to improve asthma health.

The qualitative findings regarding the impact of housing on health revealed that tenants in Clark County are faced with a multitude of stressors that can impact their health. Tenants reported health concerns such as asthma and respiratory issues; particularly among their children. However, what was even more poignant were the impacts on the emotional or mental health of tenants renting in Clark County. Many describe their living conditions as “going through hell” or a sense of their

home being violated. Many reported feelings of despair, hopelessness, and some reported feeling like they failed as a parent. Most if not all revealed the chronic stress in which their housing conditions have subjected them to.

Although the study is limited in linking health outcomes to callers of the landlord-tenant hotline cumulative data for the state and the county establish a baseline that indicates the need to improve asthma health and to alleviate the health burden of poor housing.

Policy Implementation & Implications

The Rental Housing Policy (RHP) was drafted by the SNHD in accordance to their mission to “protect and promote the health, the environment and the wellbeing of Southern Nevada residents and visitors” (SNHD, 2015). The RHP was written to be consistent with the Nevada Revised Statute (NRS § 118A.290), which requires that landlords maintain the dwelling in habitable condition and respond to complaints within specified timeframes. Despite the existence of landlord-tenant NRS § 118A.290, the current legal framework has some limitations. It requires tenants to be knowledgeable about the legal processes to obtain recourse, while adhering to sensitive timeframes. Although low-income tenants can access Nevada Legal Aid and Legal Aid Center of Southern Nevada to help through the eviction process or in filing a civil suit it does not address the fact that there is no enforcement of habitability concerns without navigating the judicial system. RHP proposed by the SNHD district will fill a gap between a habitability concern and use of the judicial system.

However, implementation of RHP and a rental housing program is going to necessitate some strategic planning to finalize the policy draft and implement the inspection and enforcement aspects of the policy. Based on the research and the current literature strategic planning must include the following; (1) integration of services among housing agencies; (2) consideration of

long-term sustainability of the program; (3) marketing of program services to target neighborhoods; (4) development of educational strategies for landlords and tenants; (5) review of recommended changes to the drafted policy to improve housing and health equity; (6) data management and monitoring and (7) strategic implementation of program services given funding limitations.

The first consideration in the strategic plan is ensuring integration of housing services across agencies that have a vested interest in rental housing. During the initial phase of the policy development only a few agencies participated in its design but more importantly there was little discussion about how housing agencies could work together to integrate services and avoid duplication of effort. It is recommended that representatives from key housing agencies be brought to the table to formulate a consistent and consolidated effort to address the quality of rental housing in Clark County. Agencies should include representatives from all code enforcement agencies, Southern Nevada Regional Housing Authority, Legal Aid Center of Southern Nevada, Nevada Legal Services and the Nevada Apartment Association.

A second point for consideration is the long-term sustainability of the program. This would need to include a review of the permit and plan review fee schedule for its applicability to develop a fee schedule that can be implemented to sustain some if not all of the program cost. At minimum the program would need 2-4 staff members to manage calls, track data and conduct inspections. A rental housing program can function similarly to other established SNHD programs that are self-sustaining such as public accommodations which govern public facilities, such as, hotels.

The third and fourth point that necessitates some consideration in terms of implementation is establishing a marketing plan and integrating educational services. Through the qualitative interview process a tenant noted the importance of making more people aware of the landlord-

tenant hotline as it serves as a good source of information for tenants to comply with NRS § 118A. Currently the only mechanism of advertising is through the SNHD website; thus there is a need to develop a strategic marketing plan in order to ensure information about the program and its services reach targeted neighborhoods. Additionally, the need to integrate educational services was found through the qualitative process and through the literature; Both tenants and landlords need to understand how to adequately address housing deficiencies, maintain the property, increase the use of integrated pest management techniques, and understand how their behaviors can reduce exposure to hazards found in the home. Thus, an integrated plan of what information to disseminate and how should be developed.

The fifth point to take into consideration is to review recommended policy changes to the current policy draft. Policy changes were informed by the literature and the data analyzed by this study. The policy as drafted incorporates health into policy provisions but does need some further clarifications to improve housing and health equity. Table 25 outlines findings from both this HIA and the housing literature, as well as, provide policy recommendations to address housing inequities in the county. Table 26 outlines findings from both this HIA and the health literature, as well as, provide policy recommendations to address health inequities.

The sixth point for consideration is an integral part of any program which includes the development of data systems that manage and track indicators, program effectiveness and allow for program evaluation. Implementation of rental housing policy will require the need to develop systems that track outcomes and policy effectiveness, thus the policy should include stipulations to track, monitor and evaluate housing and health indicators.

Table 25. Findings and recommendations to address housing inequities

Findings	Recommendations
<ul style="list-style-type: none"> • Data demonstrate a relationship between making an essential service complaint and having an income at less than 80% of the median • A review of all complaints made into the landlord-tenant hotline ¾ of the quarters of them came from ZIP codes at or less than 80% of the median income • Landlord and tenant education regarding housing hazards and impact on health are not currently offered • The literature suggest a vulnerability among immigrant and low-income populations in reporting or seeking to address rental housing complaints due to fear of retaliation • Subsection 5.2.8 indicates that advance notice and coordination be provided to individuals who may be adversely effected by pesticide application to include children, the elderly and other susceptible individuals or pets • Subsection 6.6.3 of the policy indicates that tenants must be relocated while deficiencies are being corrected • Subsection 7.4.1 indicates a letter of warning should be sent to the corresponding code enforcement agency • Policy does not define essential and non-essential services • Provisions of the policy do not define or include the use of integrated management techniques to address pest infestations • Policy includes stipulations to include a certified applicator to address pest infestation but does not specify the qualifications of someone to address mold concerns 	<ul style="list-style-type: none"> • SNHD should target inspections in target ZIP codes that are at or below 80% of median income • Provide tenant education so tenants understand how to reduce housing hazards, such as, mold, pests, VOC's and preventable housing based injuries. • Provide landlord education so they understand the importance of timely repairs and using appropriate measure to address housing concerns and how this connected to improving health. • SNHD should develop outreach & educational strategies to ensure the most vulnerable communities know about the program and understand their rights & options • Subsection 5.2.8 should also include “the disabled” in the wording • Subsection 6.6.3. incorporates a mechanism to assist renters during displacement but it needs to be more specific about relocating to an equivalent rental particularly for those with a disability • Subsection 7.4.1 warrants more meaningful involvement by the code enforcement jurisdiction in which the violation occurred to ensure integration of services • Definitions for essential and non-essential services should be included within the policy provisions • Essential services should include a functioning door lock • Policy should include the use of integrated pest management before the use of pesticides • Policy should incorporate a mechanism to ensure housing repairs are inspected and repaired by qualified personnel including mold

Table 26. Findings and recommendations to address the impact of housing on health

Findings	Recommendations
<ul style="list-style-type: none"> • Data suggest a 21% increase in risk of an asthma episode or attack among renters compared to non-renters in Nevada but was not statistically significant • Data suggest a 25% increase in experiencing an asthma episode or attack among those who have more than 6 environmental asthma triggers in the home compared to those who report 1-2 triggers and a 12% increase among those who report 3-5 triggers in the home compared to those who report 1-2 triggers. Neither regression models reached statistical significance • Qualitative analysis indicates an impact on the emotional or mental health of Clark County tenants • The YRBSS indicated a higher rate of asthma among ethnic minority groups • Students in Clark County report higher rates of lifetime asthma compared to Washoe County • Clark County hospital data reviewing asthma admission indicates vulnerabilities among the elderly and children ages 5-14 • The literature indicates higher prevalence of asthma prevalence among low-income minority neighborhoods • The literature indicates improvement of asthma health and a cost-savings when integrating a multifaceted approach via correcting housing deficiencies, providing education, and implementing behavior change • Subsection 1.15 defines children as those twelve years of age or younger 	<ul style="list-style-type: none"> • SNHD inspection processes should include the identification of environmental asthma triggers to tailor educational services • Subsection 1.15 should stipulate the age of children to include children under 18

The landlord-tenant hotline dataset had some limitations that can be addressed to improve monitoring and data analysis, in particular the inclusion of health indicators and demographic characteristics. Given the wealth of literature that substantiates the impact of housing on

respiratory health it is recommended that asthma data be collected for members of the household and distinguish asthma health by lifetime and current asthma. Adult asthma data is complex as it can be confounded by co-morbidity with other respiratory diseases and/or current smoking status. Should adult asthma data be collected these confounding variables need to be included and controlled for in the data analysis. Additionally, it is recommended to add demographic variables such as, gender, race/ethnicity, family size, disability status and household income.

Data cleaning revealed the need to categorize calls by call type, such as, renter, owner, landlord, and calls of inquiry that can easily be sorted for exclusion and inclusion purposes. Since the data collection also consists of housing parameters it is worth consideration to include parameters such as year built, housing type (e.g. apartment, home, condo, mobile home, public housing). Housing complaint categories should also include variables from the updated IOM report, housing census data, and environmental triggers used in the BRFSS data (e.g. dampness, structural deficiencies, working appliances). In addition, a review of the general maintenance category should be considered. Per the landlord-tenant hotline protocols, calls under general maintenance include complaints with appliances, electrical issues, leaks & water damage as well as fire damage. However, it may be necessary to re-examine if some of these categories should stand on their own. Notes found within the data sets also indicated the need to distinguish non-essential services complaints from interior and exterior conditions. Lastly, housing resolutions are currently dichotomized as a yes or no responses. However, this study found several areas which are in need of more inquiry and data tracking, such as, the timeliness & adequacy of repairs and displacement experienced by families; which will also allow for the tracking violations to “notices to correct deficiencies” (SNHD, 2011). Data mechanisms should be setup to track parameters as outlined in Table 27.

Table 27. Findings and recommendations for data management and monitoring

Findings	Recommendations
<ul style="list-style-type: none"> • The landlord-tenant hotline dataset used for this analysis did not include health indicators as a tracking mechanism • The data tracking mechanism could be improved to be consistent with the literature 	<ul style="list-style-type: none"> • SNHD should modify policy to include the maintenance of the landlord-tenant hotline Recommendations for management & monitoring <ul style="list-style-type: none"> • Incorporate parameters to track health measures and outcomes of concern • Incorporate demographic variables (gender, race/ethnicity, disability status, family size, household income) • Reclassify complaint categories to be consistent with the most updated IOM report and American Housing survey ie. dampness, working appliances • Review general maintenance category to see if some complaints under this category can stand alone • Distinguish non-essential service complaints by interior or exterior occurrences • Distinguish calls by type; renter, owner, landlords, and those of inquiry • Distinguish residence by type; apartment, home, condo, mobile home, and public housing • Include year of housing in data parameters • Track resolution complaints and indicate the adequacy of the resolution and/or level of displacement <ul style="list-style-type: none"> • Addressed: adequately addressed within NRS timeframes • Addressed: not adequately addressed but within NRS timeframes • Addressed: moved to another unit • Not addressed • Not addressed: broke lease • Not addressed: was let out of lease • Evicted

The final point of consideration is how to best implement a rental housing policy & program while taking into consideration health determinants and financial challenges. The SNHD is no different than other jurisdictions that have to contend with budget constraints while addressing the needs of the community. Given the funding limitations, a tiered system in which inspections are conducted in target areas or areas of need can serve as an alternative. A similar system has been implemented in Portland, Oregon. Portland has two different types of inspection models: the standard model, which is complaint-based and the enhanced model which is also

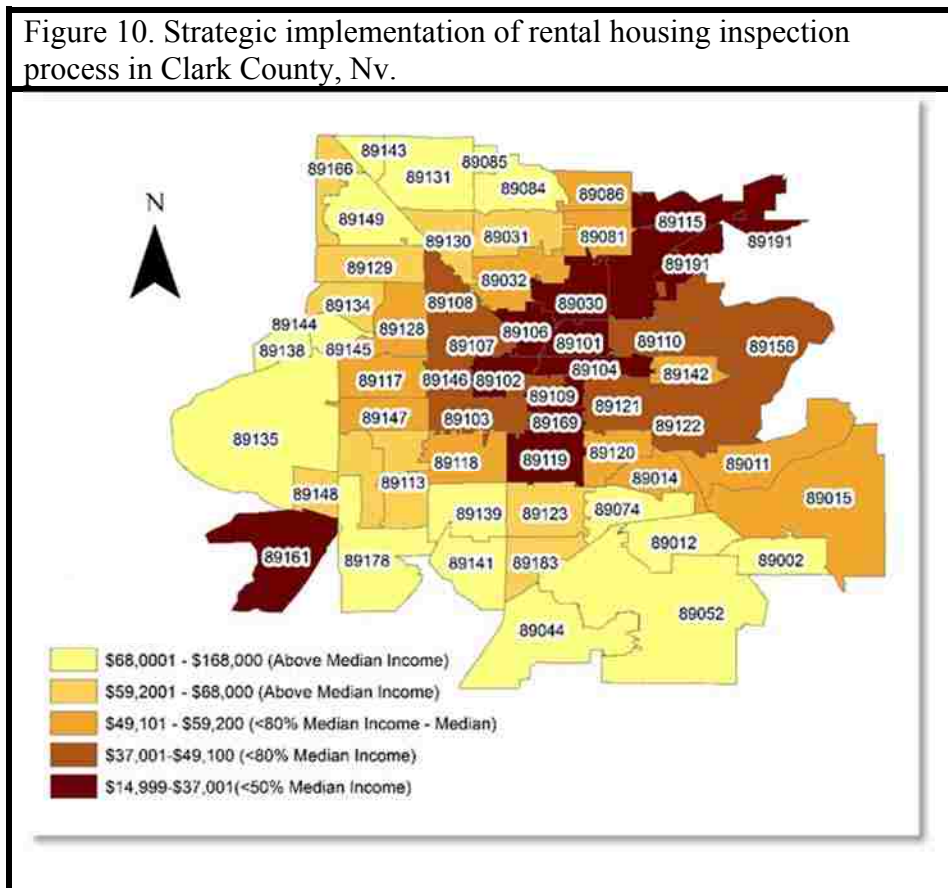
complaint based, but allows for the inspection of additional units if a certain threshold of violations (interior and exterior of property) is met by the same landlord (White & McGrath, 2012). The enhanced model was developed to address barriers to reporting housing problems found under the standard model, such as fear of retaliation, language barriers, and lack of education/awareness to rights regarding housing conditions. The enhanced model targets communities where renters are spending more than 30% of income on housing.

At present the following scenarios were considered by this HIA: (1) complete termination of the landlord-tenant hotline; (2) implementation of rental housing policy with complaint –based inspection efforts targeted in vulnerable communities; (3) implementation of rental housing policy with complaint –based inspection efforts targeted in vulnerable communities but adding a mechanism to inspect other units if a set number of violations are identified by the same landlord and (4) implementation of rental housing policy with complaint-based inspections conducted county-wide. Scenarios 2-4 would include recommendations for data management & monitoring and integration of educational services. Strategies are discussed further below and the projected health impacts on health determinants, based on the literature and the evidence found during this HIA, are outlined in Table 28 with corresponding impacts on direction, magnitude, severity, and equity of health determinants.

Scenario 1 considers the complete termination of the landlord-tenant hotline. It is projected to have the biggest negative impact on housing inequities and consequently on health. Complete termination will leave vulnerable communities with very little to no recourse to address housing concerns outside of the judicial system. At present the landlord-tenant hotline provides information on how to file a complaint as per NRS. It is also available five days a week during typical business hours to address question and concerns. Those who participated in the qualitative interviews

consistently indicated how important the landlord tenant hotline was in providing information on how to file a complaint; for some this was enough to help them get a resolution. Complete dissemination of the landlord-tenant hotline could result in a negative impact on health determinants.

The second scenario takes into consideration the economic climate of the county and the limited resources available to staff a rental housing program that can conduct enforcement on non-compliant landlords. Strategic implementation of a complaint-based model would include the dissemination of services in target neighborhoods to ensure limited staffing can target the most at risk communities in Clark County (Figure 10).



Based on the data collected from this study inequities in housing were identified specifically among those who make less than 80% of the area median income. Figure 10 shows a geospatial representation of Clark County zip codes by income categories above or below median income. This HIA anticipates that the ability to enforce NRS and correct housing deficiencies within at risk-communities is expected to positively impact health determinants and improve health equity related to housing.

The third scenario is similar to scenario 2 but follows a similar model to the Portland, Oregon inspection model in which additional units are inspected when one unit meets a certain number of violations. In terms of impacts on health determinants it is projected by this HIA to make a significant impact on the number of persons this model will impact and the permanence of the impact. This scenario is expected to make the biggest impact in terms of health and housing equity. Based on the literature, many communities of low-income or minority status fail to address their housing concerns for fear of retaliation. It is likely that similar populations in Clark County are not calling into the landlord-tenant hotline and thus are not being identified in this study. Under this model families who would not typically make a complaint, about their housing condition, may have their concerns addressed although they did not precipitate the call into the landlord-tenant hotline reducing the fears of being targeted by the landlord for making a complaint.

Scenario four entails the implementation of the rental housing program to be implemented county-wide on a complaint-basis. It is important to note that the consideration of strategic implementation does not imply that other areas of the county are not in need of rental housing enforcement. A total of 462 (16.1%) of the calls came from those just below Clark County median income. A complaint based model is expected to make a sizable impact on the number of people this scenario will impact and its permanence. However without the ability to capture those who

are not likely to contact the landlord tenant hotline the impact on equity is expected to decrease as compared to the second and third scenario.

Table 28. HIA projected impacts on health determinants				
Scenario	Direction of Impact	Magnitude of Impact	Severity of Impact	Equity Impacts
Terminate landlord-tenant hotline	-	Major	Major	--
Rental housing policy + target vulnerable communities (education + improved data collection)	+	Moderate	Moderate	++
Rental housing policy + target vulnerable communities + inspection of additional units (education + improved data collection)	+	Major	Major	++
Rental housing policy + inspections county-wide (education + improved data collection)	+	Major	Major	+
<p>Explanations:</p> <ul style="list-style-type: none"> • Direction of impact refers to whether a given scenario will positively impact health determinants (+), negatively impact health determinants (-), or have no impact on health determinants (~). • Magnitude of impact reflects a qualitative judgment of the size of the population of the anticipated change in health determinant effect: minor, moderate, major. • Severity of impact reflects the nature of the effect on health determinants and its permanence: minor, moderate, major. • Equity Impact reflects a qualitative judgment of the magnitude of the anticipated change in health inequities related to housing conditions: (--)=moderate increase in health inequities related to housing; (-)= minor increase in health inequities related to housing; (~)=no change; (+)=minor improvement in health equity related to housing; (++)=moderate improvement in health equity related to housing. 				

Table adapted from (White & McGrath, 2012)

Scenario's two to four take into consideration the need to address housing inequities in Clark County housing while considering some of the funding limitations. It is possible to strategically plan to increase the impact of the program as funding resolutions are found. Thus, starting with scenario two, moving towards scenario four and considering modifying scenario four to include additional inspections for "repeat offenders".

It is anticipated that rental housing policy will have a positive impact on health determinants but it necessitates discussion of possible negative impacts the policy can have. During the qualitative analysis tenants were asked to identify any cons to policy implementation. Not one of the tenants identified any negative aspects to them as a renter to having policy as they all saw policy as a positive impact and as a means to address the concerns they were going through. However, one of the study limitations is that landlords were not interviewed as part of the study design. When the policy was initially drafted a lot of push back was received from the landlord community as it would cause changes to the "cost of doing business". Further analysis is warranted before implementation to review possible scenarios that may negatively impact renters in Clark County. It is possible that the "cost of doing business" may be placed on the tenant by increasing rent, which can lead to a shortage in affordable housing options for renters and placing them in circumstances that lead to displacement.

There is no question that some challenges will be faced because the policy does impact landlords in Clark County in a financial sense. However it is important to take a few things into consideration. Landlords are not being asked to do anything that doesn't already exist in the NRS, thus the landlords who will be impacted the most are those who have not upheld the law and have deferred maintenance to their properties. Furthermore, the need for the SNHD to develop a landlord-tenant hotline has resulted from non-compliance with NRS; as such has left the SNHD

with having to absorb the cost to support the program or find funding to continue providing services to Clark County residents. It is also worth noting that as a county we put great emphasis on protecting “visitors” to our community through public accommodation policies however the SNHD has no policies to enforce the quality of rental housing for those who “live” in our county.

A review of the proposed RHP indicated substantial consideration for the health and safety of Clark County residents. It takes into consideration most if not all the housing hazards that can have a negative impact on health. Most importantly it provides a mechanism through which tenants can have their housing concerns addressed without navigating the judicial system, it can contribute to housing equity, particularly among our most vulnerable populations, and it establishes a standard for quality housing. Furthermore, it addresses concerns identified through this study which include displacement, and the timeliness & adequacy of repairs. It is recommended by this HIA to implement RHP with improved data management and monitoring, as well as, integration of educational services.

Research Limitations

A summary of limitations to this study are as follows: The use of two distinct secondary databases to analyze health and housing data did not allow for direct inferences between housing and health within the segment of the population who contacted the landlord-tenant hotline. In addition the landlord-tenant hotline, the qualitative interviews, and the BRFSS data are all self-reported data and are subject to recall bias, underreporting, or over reporting. Furthermore, BRFSS participants are a representation of those with a working phone or cell phone and a willingness to participate in the study; in particular for those who participate in the asthma call-back survey who are a representation of those who agree to be called back. Although duplication of cases is possible within the BRFSS survey it is anticipated that duplication is minimal since the survey is conducted

as random selection process of the entire population of Nevada. This means about 2,500 – 4,000 people are selected out of 2.7 million.

The use of median income is commonly used in data analysis. However, it is not without its limitations. Median income by definition represents the value in the middle therefore does not take into account incomes on complete opposite ends of the spectrum; which means that median income may not be the best representation of income for each corresponding zip code. In addition, dichotomizing median income does lead to a loss of effect size and limits the statistical power and analysis as a dichotomous variable.

The qualitative process gathered rich data detailing the experiences of renters in Clark County, however, was limited in the sense that the study design did not examine the impact or experiences of landlords in Clark County. Given the initial push back from landlords to rental housing policy it is worth further examination to ensure equity in the process while keeping health as a major focus.

Evaluation & Monitoring of Rental Housing Policy HIA

Evaluation is an important part of the HIA process. It is an informative process that allows guides future HIAs by summarizing the successes and challenges of the current HIA. An HIA evaluation encompasses three important components, which include process & impact evaluation and outcome monitoring. Process evaluation evaluates the procedure of completing the HIA. It describes what worked and what did not work during the current HIA. Impact evaluation evaluates the effect the HIA can have on the decision making process. The final step of an HIA is monitoring. Monitoring is the method by which predicted health outcomes are tracked and that the policy is implemented as agreed upon (Harris, Harris-Roxas, & Kemp, 2007).

Process Evaluation

The scoping and screening stages were conducted under a strategic planning grant conducted several years ago by the Nevada Healthy Homes Partnership. Delays in proposing the policy to the Board of Health and loss of funding allocation to the landlord-tenant hotline was the impetus to conducting an HIA in the proposed format; with one doctoral candidate with an advising committee.

This HIA was completed in the form of a rapid HIA in which data was evaluated utilizing a mix-methods approach. In a rapid HIA format, much of the data analyzed was secondary in nature and thus data gathering was limited to what was available. One of the biggest limitations of the datasets was the lack of demographic and health indicators that directly correspond to the population contacting the landlord-tenant hotline. It minimized the ability to derive inferences about the health of the population contacting the landlord-tenant hotline and the impact housing can directly have on health of Clark County renters.

Despite its limitations, this HIA identified specific vulnerabilities that exist within Clark County housing through a qualitative and quantitative analysis. Given the limited resources in the county the policy recommendations were prioritized as a tiered system in which those most vulnerable would continue to have access to assistance.

Impact Evaluation

Although it is unknown at this time whether this HIA will have a direct impact on the decision making process to continue consideration of RHP, it anticipated that a summary of this HIA will be provided to the Southern Nevada Health District (SNHD) to inform the current administration of the need for RHP. However, information gathered during this HIA process can be utilized to better inform the policy implementation process.

Outcome Monitoring

Outcome evaluation aims to measure the changes in predicted health outcomes (Harris, Harris-Roxas, & Kemp, 2007). It requires the collection of baseline data, implementation of the policy or program and measuring outcome data. This HIA will not be able to directly measure asthma health outcomes or improvements in housing, however, data management and monitoring recommendations are fully detailed earlier in this chapter and provide starting point on how to improve baseline data collection and monitoring. Recommendations include tracking of unanticipated findings from this study which identified vulnerabilities among those with disabilities, those who report less than good credit and the varying forms of displacement within the rental housing population.

Conclusions & Recommendations for Future Research

Our health is impacted by where will we live and the community around us. Where we live matters and the quality of our home can impact our physical and mental health. This HIA found that the current landlord-tenant hotline model has provided the public with information on how to make a complaint and has aided in the resolution of some complaints, but remains constrained by the inability to enforce NRS § 118A. It also found that housing inequities exist especially in families who earn less than 80% of median income, they are more likely to go without critical essential services such as gas, water, power or ability to cool or heat their home. Furthermore, this HIA identified the need to track a variety of housing and health indicators and was able to propose several different scenarios to strategically implement a rental housing program with recommendations that include multi-housing agency involvement, program sustainability, marketing, educational services, changes to current policy draft to improve housing and health equity, and data management and monitoring.

The Southern Nevada Health District's proposed Rental Housing Policy has the potential to improve housing quality, health outcomes, resolve inequities within the current rental housing market, and reduce health disparities. Data collected from this HIA appears to be consistent with the literature that indicates an unequal distribution of residential hazards in homes among poor and minority communities. Those in rental housing are more likely to be exposed to health damaging features of the environment such as dampness, noise, crime and vandalism, and less likely to have access to health promoting features of the environment such as gardens and local amenities (Macintyre, et al., 2003). Although it is anticipated that RHP will have a positive impact in determinants of health it is equally noted that RHP only addresses one of the main contributors to health from the built environment but certainly functions as a pathway to increase equity and alleviate the burden of poor housing and corresponding health conditions. Overall, the data suggest that place matters, where we live matters and where we fall on the social economic gradient matters. To address housing as a social determinant of health we must address housing inequities that exist among low-income renters in Clark County, Nevada; this can be done with the implementation of housing policy that provides the SNHD enforcement authority.

There are many avenues by which future research can help fill necessary gaps in understanding housing policy, health impacts, housing conditions and neighborhood effects. In particular, very little is published on the landlord-tenant dynamic in terms of how landlords respond or don't respond to housing complaints. The adequacy and timeliness of their response is important to the health of renters and to ensure that they are abiding by housing policies that were instituted to protect the health of tenants. Adult asthma studies are limited although needed. Future studies should examine how and if addressing environmental asthma triggers in the home can improve asthma health among adults. Additionally, it is worth considering adding the

environmental asthma triggers in the adult call-back survey to the childhood module of the BRFSS. It is hoped that this analysis showed the importance of integrating a Health Impact Assessment to the policy making process.

APPENDIX 1

Clark County Rental Housing Policy

SOUTHERN NEVADA HEALTH DISTRICT REGULATIONS GOVERNING

PUBLIC HEALTH IN HOUSING

WHEREAS, the Southern Nevada Health District (SNHD) is the public health entity for Clark County, Nevada, and pursuant to Nevada Revised Statutes (NRS) Chapter 439, has jurisdiction over all public health matters in Clark County, Nevada; and

WHEREAS, NRS 439.366 authorizes the Southern Nevada District Board of Health (Board), SNHD's governing body, to adopt regulations to prevent and control public health hazards and nuisances and to protect and promote the public health and safety in the geographical area subject to the SNHD's jurisdiction; and

WHEREAS, NRS 439.479 authorizes the SNHD to regulate any health hazard on residential property, rental dwellings, or on commercial property; recover all related costs incurred; and establish an administrative hearing process to address such concerns; and

WHEREAS, NRS 439.490 authorizes the SNHD to order the abatement or removal of any nuisance; and

WHEREAS, the Board finds that public health nuisances (PHNs) and hazards in housing affect the health and the well being of the residents of Southern Nevada, and finds that it is necessary to adopt SNHD Regulations Governing Public Health in Housing to prevent and control health and safety hazards, and to regulate the safe and sanitary conditions of those areas and structures where PHNs previously existed; and

WHEREAS, the SNHD recognizes the importance of applying the principles of maintaining healthy housing as defined by federal, state, and local agencies and authorities; with the intent to reduce illness and injuries resulting from unsafe and unhealthy living conditions in Clark County homes; and

WHEREAS, the owners of all dwellings, including real property, manufactured homes, mobile homes, or factory-built housing located within Clark County who rent such dwellings to individuals for residential purposes and the tenants who reside in such rental properties shall maintain that property in a condition that does not pose a health and safety hazard to the residents of the property or to the occupants of the neighboring properties or dwelling units; and

WHEREAS, the Board believes that the following Regulations are designed to protect and promote the public health and safety, it does therefore publish, promulgate and order compliance within Clark County, Nevada with the substantive and procedural requirements hereinafter set forth.

INTENT AND SCOPE

Intent The purpose of these Regulations is to protect and promote the public health, safety, and environment through preventive measures and timely correction of significant public health and environmental issues associated with rental dwelling properties.

Scope These Regulations apply uniformly to all buildings, structures, or parts thereof that are designed, intended for use, or used for human habitation.

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APPENDICES

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Section 1

DEFINITIONS

Summary of abbreviations of terms used in these Regulations

EPA	United States Environmental Protection Agency
° F	Degrees Fahrenheit
Building Code	International Building Code
IDLH	Immediately Dangerous to Life or Health
ISDS	Individual Sewage Disposal System
NAC	Nevada Administrative Code
NRS	Nevada Revised Statutes
ppm	Parts per million
PHN	Public Health Nuisance
REHS	Registered Environmental Health Specialist
SDWA	Safe Drinking Water Act
SNHD	Southern Nevada Health District

As used in these Regulations, unless the context otherwise requires, the following words and terms defined have the meanings ascribed to them in this document.

1.1 “Abate” defined. Abate means to suppress or put an end to a public nuisance or contributing act, or to reduce the degree or the intensity of a public nuisance to a level acceptable to the Health Authority.

1.2 “Administrative Hearing Officer” defined. An Administrative Hearing Officer is the person designated by the Health Authority to conduct a hearing relating to a citation, order, or notice issued by the Health Authority or any other matter relevant to the enforcement of these Regulations.

1.3 “Agency of jurisdiction” defined. The agency of jurisdiction is the local building department; safety authority; fire marshal; business licensing; police; another federal, state, or local health agency; federal regulatory agencies; departments of agriculture; other than the Health Authority; having jurisdiction concerning construction, operation, maintenance, and public safety of any dwelling or dwelling unit, congregate residence, structure, natural or man-made area, natural or man-made body of water, or facility.

1.4 “Air conditioner” defined. An air conditioner is a home appliance, system, or mechanism designed to dehumidify and extract heat from an area. The cooling is done using a simple refrigeration cycle. Its purpose in a building is to provide comfort during either hot or cold weather and to control air quality through the use of filters.

- 1.5 “Approved” defined. Approved means acceptable to the Health Authority based on conformance with any applicable, adopted Regulations, good public health practices, and recognized industry standards.
- 1.6 “Asbestos or asbestos material” defined. Asbestos or asbestos material is chrysotile, amosite, crocidolite; or in fibrous form, tremolite-asbestos, anthophyllite-asbestos, or actinolite-asbestos; or asbestos or any material containing asbestos.
- 1.7 “Bathroom” defined. A bathroom is a room which contains a bathtub or a shower, or both.
- 1.8 “Bedding” defined. Bedding includes mattresses, quilts, blankets, sheets, pillows, comforters, and spreads.
- 1.9 “Breeding source” defined. A breeding source is any area capable of sustaining the reproduction of mosquitoes, rodents, or other pests such as cockroaches, other insects, or spiders. Breeding sources for mosquitoes may include, but are not limited to, artificial containers (e.g., buckets, barrels, tires, bottles, tubs, tanks, gutters, bird baths, etc.), water features, ditches, streams, flooded areas, and all other such sources of standing water or other liquid. Breeding sources for rodents; arthropod pests (e.g., cockroaches and other insects; spiders, scorpions, and centipedes) include secluded outdoor or indoor areas such as walls, retaining garden walls, woodpiles, leaf or compost piles, unsecured solid waste containers, or any other area providing harborage, food and water sources, and secure nesting or living areas sufficient to breed and complete the life cycle of the pest animal.
- 1.10 “Building” defined. A building is a fixed construction with walls, foundation, and roof, such as a house, factory, storage building, or garage.
- 1.11 “Business day” defined. A business day is Monday through Friday with the exception of federal and state holidays.
- 1.12 “Carbon monoxide detector” defined. A carbon monoxide detector is a detector comprising an assembly that incorporates a sensor, control components, and an alarm notification appliance in one unit operated for the purpose of detecting carbon monoxide gas.
- 1.13 “Cease and Desist Order” defined. A Cease and Desist Order is a written Order issued by the Health Authority which directs the responsible person, whether the responsible person is the Landlord or tenant, to immediately stop doing or allowing a specific action to occur at a residence; dwelling unit; commercial property; health-permitted facility of any type; natural or man-made areas, structures, or bodies of water; or any other similar location which is causing, allowing, or creating the conditions that has or are likely to result in the occurrence of a PHN. A Cease and Desist Order does not include an inherent direction to completely cease operating any of the above-listed locations. Under certain circumstances, a Cease and Desist Order can include a timeframe to achieve compliance with the Order so long as there is not an imminent threat to public health or safety.

1.14 “Central heating system” defined. A central heating system is a single system supplying heat to one or more dwelling unit(s) or more than one rooming unit or congregate residence.

1.15 “Certified applicator” defined. A certified applicator is any person who is certified by the Director of the Nevada Department of Agriculture as qualified to use or to supervise the use of any restricted-use pesticide.

1.16 “Children” defined. For the purposes of these Regulations, children are defined as people twelve (12) years of age or younger.

1.17 “Clean” defined. Clean means free of visible dirt, dust, sludge, foam, slime (including algae and fungi), bodily excretions or secretions, rust, scale, mineral deposits, accumulation of impurities, and/or other foreign material.

1.18 “Communicable disease” defined. A communicable disease is a disease which is caused by a specific infectious agent or its toxic products, and which can be transmitted, either directly or indirectly, from a reservoir of infectious agents to a susceptible host organism. Transmission can include methods that involve a vector pest.

1.19 “Congregate residence” defined. A congregate residence is any building or portion thereof that contains facilities for living, sleeping, and sanitation, as required by code, and may include facilities for eating, cooking, or for occupancy by other than a family. A congregate residence may be a shelter, convent, monastery, dormitory, and fraternity or sorority house, but does not include jails, hospitals, nursing homes, public accommodation facilities, or lodging houses.

1.20 “Dangerous structure or conditions” defined. Dangerous structure or conditions means a structure or condition that may cause injury to or endanger the health, life, property, or safety of the general public or the occupants, if any, of the real property on which the structure or condition is located. The term includes, without limitation, a structure or condition that does not meet the requirements of a code or regulation adopted pursuant to NRS 268.413 with respect to minimum levels of health or safety or violates an ordinance, rule, or regulation regulating health and safety enacted, adopted, or passed by any agency of jurisdiction, the violation of which is designated as a nuisance in the ordinance, rule or regulation.

1.21 “Debris” defined. Debris means materials which may be present in accumulations including, but not limited to: deteriorated lumber; old newspapers; furniture parts; stoves, sinks; cabinets; household fixtures; refrigerators; car parts; abandoned, broken, or neglected equipment; or the scattered remains of items.

1.22 “Deterioration” defined. Deterioration means a lowering in quality of the condition or appearance of a building, structure, or premises or parts thereof characterized by holes, breaks, rot, crumbling, cracking, peeling, rusting, or any other evidence of physical decay, damage, neglect, or lack of maintenance.

1.23 “Dilapidated” defined. Dilapidated means in a state of disrepair or ruin and no longer adequate for the purpose or use for which it was originally intended.

1.24 “Dwelling” or “dwelling unit” defined. A dwelling or dwelling unit is any enclosed space, structure, or part of a structure, including manufactured homes, mobile homes, or factory-built housing that is wholly or partly occupied as, used, or designed or intended for occupancy as a residence for living, sleeping, cooking, and eating by one person who maintains a household or by two or more persons who maintain a common household.

1.25 “Dwelling unfit for human habitation, use, or occupancy” defined. Dwelling unfit for human habitation, use or occupancy means any dwelling, apartment house, congregate residence, lodging house, manufactured home, mobile home, or factory-built housing or other structure for living or sleeping purposes which, by reason of its construction or by reason of the lack of maintenance or repair thereof, is in such a condition as creates a hazard to the health, welfare, or safety of its occupants.

1.26 “Egress” defined. Egress means a continuous and unobstructed path of travel from any point in a dwelling, arranged with accessible openings to the exterior of the structure, to ensure safe means of exit from the building to an abutting public way or area.

1.27 “Electrical lighting” defined. Electrical lighting is lighting that uses electricity to produce illumination, also called electric lamps. Illumination produced electrically.

1.28 “Enforcement” defined. Enforcement means diligent effort to secure compliance, including review of plans and permit applications, response to complaints, citation of violations, and other legal processes. Except as otherwise provided in these Regulations, enforcement may include inspections of existing land, buildings, and structures.

1.29 “Environmental surface” defined. An environmental surface is the surface of any furniture, equipment, fixtures, walls, floors, ceilings, hand washing sinks, toilets, tables, countertops, cabinets, play equipment, or similar surface which is part of a dwelling.

1.30 “Equipment” defined. Equipment includes any articles that are used in the functional operation of a dwelling such as a freezer, refrigerator, ice maker, mixer, oven, stove, scale, sink, table, temperature measuring device, laundry washer, dryer, or warewashing machine. This definition excludes disposable or single-use articles which are discarded after use. The term equipment may also be used when referring to the mechanical devices comprising a swimming pool, spa, or water feature.

1.31 “Exterior opening” defined. An exterior opening is any open or closed window, door, or passage designed and installed to open between interior and exterior spaces of the dwelling or to provide egress to the outside of the dwelling.

1.32 “Factory-built housing” defined. Factory-built housing is a residential building, dwelling unit, or habitable room thereof, which is either wholly manufactured or is in substantial part manufactured at an off-site location to be wholly or partially assembled on-site in accordance

with regulations adopted by the Manufactured Housing Division of the Department of Business and Industry pursuant to NRS 461.170, but does not include a mobile home or recreational park trailer.

1.33 “Family or household” defined. A family or household is one or more individuals living together in a single dwelling unit and sharing common living, sleeping, cooking, and eating facilities.

1.34 “Flush toilet” defined. A flush toilet is a toilet bowl that can be flushed with water supplied under pressure and that is equipped with a water-sealed trap above the floor level.

1.35 “Foot-candle” defined. Foot-candle is a unit of measure of the intensity of light falling upon a surface, equal to one lumen per square foot and originally defined with reference to a standardized candle burning at one foot from a given surface.

1.36 “Fumigation” defined. Fumigation is the application of a poisonous substance that has a vapor pressure greater than five (5) millimeters of mercury at 77° F that is intended to destroy living organisms, e.g., methyl bromide.

1.37 “Furniture” defined. Furniture is any movable article in a room or public area that makes the area fit for living or working. Furniture includes but is not limited to, tables, chairs, bed headboards, bed frames, box frames, sofas, carpets, curtains, pictures, vases, mirrors, televisions and other electrical equipment, and appliances. Bedding, utensils, and tableware are NOT considered to be furniture.

1.38 “Guest” defined. A guest is an individual who shares a dwelling unit with a tenant in a nonpermanent status for not more than 30 days.

1.39 “Habitable room” defined. A habitable room is a room or enclosed floor space used or intended to be used for living, sleeping, cooking, or eating purposes; excluding bathrooms, laundries, furnace rooms, pantries, kitchens, and utility rooms, foyers, or communicating corridors, stairways, closets, storage spaces, workshops, and hobby and recreation areas.

1.40 “Hand washing sink” defined. A hand washing sink is a lavatory, a basin or vessel for washing, a wash basin, or a plumbing fixture especially placed for use in personal hygiene and designed for the washing of the hands. Hand washing sink includes an automatic hand washing facility.

1.41 “Harborage” defined. Harborage means any condition or place which may provide shelter for public health vectors or favor their multiplication or continued existence.

1.42 “Health Authority” defined. Health Authority means the officers and agents of the Board and the SNHD.

1.43 “Health hazard” defined. Health hazard means any biological, physical, or chemical exposure, condition, or public nuisance that may adversely affect the health of a person.

1.44 “Heater” defined. Heaters include all furnaces, unit heaters, domestic incinerators, cooking and heating stoves and ranges, and other similar devices.

1.45 “Hot water” defined. Hot water is water that attains and maintains a temperature between ninety (90) and one hundred twenty (120) degrees Fahrenheit (°F). Each application of hot water in a dwelling, such as hand washing, ware washing, or other uses may require a more specific temperature range to be effective and appropriate for that use.

1.46 “Imminent hazard” defined. An imminent hazard is any condition associated with real property that places a person’s life, health, or property in high risk of peril when such condition is immediate, impending, or on the point of happening or menacing.

1.47 “Infestation” defined. An infestation is the existence of any pests, which inhabit or overrun in numbers or quantities large enough to be harmful, threatening, or obnoxious, or otherwise considered a nuisance. Infestations may also exist as parasites living on or in the environment of humans, such as bedbugs or lice.

1.48 “Kitchen” defined. A kitchen is a room within a dwelling or dwelling unit or part of a building equipped for preparing and cooking food.

1.49 “Landlord” defined. The Landlord is the person who provides a dwelling unit for occupancy by another person, the tenant, pursuant to a rental agreement. The property owner may employ or use the services of a property manager or property management company, or other designated person, but the property owner is ultimately accountable for the remediation of PHNs. The term Landlord, for the purposes of these Regulations, is the property owner or their designated responsible person, property manager, or property management company.

1.50 “Lead” defined. Lead is a naturally occurring heavy metal element that is widely present in the environment due to both its natural occurrence and human activities. Lead toxicity in humans has been well documented and adversely impacts many body systems. Even low exposures to lead have been shown to severely affect the development of children under the age of six. There is no safe level of lead for children.

1.51 “Lead-based paint” defined. Lead-based paint is paint or other surface coatings that contain lead equal to or in excess of 1.0 milligram per square centimeter or 0.5 percent by weight.

1.52 “Licensing authority” defined. The licensing authority is any agency of Clark County or an incorporated city within Clark County that meets the requirements for which they are authorized to issue the particular license sought by the applicant.

1.53 “Manufactured home” defined. A manufactured home is a structure which is built on a permanent chassis; designed to be used with or without a permanent foundation as a dwelling when connected to utilities; transportable in one or more sections; and eight (8) feet or more in body width or forty (40) feet or more in body length when transported, or, when erected on-site,

contains 320 square feet or more. The term includes the plumbing, heating, air-conditioning, and electrical systems of the structure.

1.54 “Mobile home” defined. A mobile home is a vehicular structure which is built on a chassis or frame, is designed to be used with or without a permanent foundation, is capable of being drawn by a motor vehicle, and is used as a dwelling when connected to utilities.

1.55 “Mold” defined. Mold is any of the microscopic organisms of the kingdom Fungi, which possess a filamentous structure or mycelium. Molds are devoid of chlorophyll and generally have cell walls made primarily of chitin.

1.56 “Multi-family dwelling” defined. A multi-family dwelling is a structure that contains more than one separate residential dwelling unit, which is used or occupied, or intended to be used or occupied, in whole or in part, as the home or residence of one or more persons.

1.57 “Natural light” defined. Natural light is light supplied by the sun, as opposed to artificial light from light bulbs.

1.58 “Nuisance” defined. A nuisance is anything, which is injurious to health, or offensive to the senses, so as to interfere with the comfort or endanger the health or safety of the public.

1.59 “Occupant” defined. The occupant is any person who has the use of or occupies any building or any part thereof or who has the use or possession, actual or constructive, of the premises whether the property owner or tenant. In the case of vacant buildings or vacant portions of a building, or in case of occupancy in whole or in part by the property owner, the owner of the building shall be deemed to be, and shall have responsibility of an occupant of such building.

1.60 “Overcrowd” defined. To overcrowd means to overfill a room and/or dwelling unit with human occupants beyond permissible occupancy, causing a condition where there is insufficient and inadequate housing space to support the needs and desires of a family or group for a good quality of life.

1.61 “Pathogenic” defined. Pathogenic means the ability to produce disease.

1.62 “Permissible occupancy” defined. Permissible occupancy means the maximum number of individuals permitted to reside in a dwelling unit, rooming unit, or dormitory.

1.63 “Person” defined. The term, person, includes individuals, firms, partnerships, associations, public or private institutions, municipalities, political subdivisions of the state of Nevada, governmental agencies, or public or private corporations and limited liability companies.

1.64 “Pest” defined. Pests are living organisms that occur where they are not wanted or that cause damage to crops or humans or other animals. Common examples include: insects, rodents,

and other animals, unwanted plants (weeds), fungi, and pathogenic microorganisms such as bacteria and viruses, and prions.

1.65 “Pest control” defined. Pest control is the control and elimination of insects, rodents, or other pests by eliminating their harborage places; by removing or making inaccessible materials that may serve as their food; by exterminating, poisoning, spraying, fumigating, trapping, or any other recognized and legal pest elimination methods approved by the agency of jurisdiction with regard to integrated pest management.

1.66 “Pesticide” defined. A pesticide is any substance or mixture of substances, including any living organisms or any product derived therefrom or any fungicide, herbicide, insecticide, nematocide, or rodenticide intended to prevent, destroy, control, repel, attract, or mitigate any insect, rodent, nematode, snail, slug, fungus, and weed and any other form of plant or animal life or virus, except virus on or in a living human or other animal, which is normally considered to be a pest.

1.67 “Plumbing” defined. Plumbing includes all of the following supplied facilities and equipment: gas pipes, gas burning equipment, water pipes, garbage disposal units, waste pipes, toilets, sinks, installed dishwashers, bathtubs, shower baths, installed clothes washing machines, catch basins, drains, vents, and similarly supplied fixtures, and the installation thereof, together with all connections to water, sewer, or gas lines.

1.68 “Plumbing code (PC)” defined. Plumbing Code means the International or Universal Plumbing Code or the PLUMBING SYSTEMS chapter of the International or Universal Building Code relevant to plumbing adopted by the building department of the agency of jurisdiction.

1.69 “Potable water” defined. Potable water is water that is safe for human consumption.

1.70 “Premises” defined. Premises means a dwelling unit and the structure of which it is a part, facilities, furniture, utilities and appurtenances therein and grounds, areas and facilities held out for the use of tenants.

1.71 “Property” defined. Property means land and improvements (real property), and includes water located thereon.

1.72 “Property manager” or “property management company” defined. A property manager or property management company is a person or entity that serves as an agent of the property owner in carrying out or performing agreed upon management services for the benefit of the owner and the property itself.

1.73 “Property owner” defined. The property owner is one or more persons, jointly or severally, in whom is vested all or part of the legal title to property, except a trustee under a deed of trust who is not in possession of the property or all or part of the beneficial ownership, and a right to present use and enjoyment of the premises. Lawful title as determined by the Clark

County Assessor at the time of service is used to identify the property's legal owner at the time of inspection or assessment.

1.74 "Public accommodation facility" defined. A public accommodation facility is a hotel/casino, resort, hotel, motel, hostel, bed and breakfast facility, or other facility offering rooms or areas to the public for monetary compensation or other financial consideration on an hourly, daily, or weekly basis.

1.75 "Public area" defined. A public area is any area open to public view, whether indoors or outdoors to which the public has approved access, excluding individual classrooms, play areas, and restrooms, at a dwelling unit.

1.76 "Putrescible" defined. Putrescible means capable of being decomposed by microorganisms with sufficient rapidity as to cause nuisances from odors or gases.

1.77 "Rent" defined. Rent means all periodic payments to be made to the Landlord for occupancy of a dwelling unit, including, without limitation, all reasonable and actual late fees set forth in the rental agreement.

1.78 "Rental agreement" defined. The rental agreement is any oral or written agreement for the use and occupancy of a dwelling unit or premises.

1.79 "Responsible person" defined. The responsible person is the individual designated by the property owner as being responsible for compliance with these Regulations.

1.80 "Restricted-use pesticide" defined. A restricted-use pesticide is any pesticide, including any highly toxic pesticide, which the Nevada State Department of Agriculture has determined after a hearing, to be injurious to persons, pollinating insects, bees, animals, crops or land, other than pests or vegetation it is intended to prevent, destroy, control or mitigate; or detrimental to vegetation, except weeds; wildlife; or public health and safety; or has been classified for restricted use by or under the supervision of a certified applicator in accordance with Title 7, Agriculture; Chapter 6, Insecticides and Environmental Pesticide Control; Subchapter II, Environmental Pesticide Control; Section 136.

1.81 "Restroom" defined. A restroom is a room that contains one or more flush toilets and one or more hand washing sinks, unless the hand washing sinks are located in an easily accessible area not directly within the toilet room.

1.82 "Rodent" defined. A rodent is a member of the mammalian order Rodentia, characterized by front teeth adapted for gnawing and cheek teeth adapted for chewing. The most common rodent groups of public health significance include those containing mice and rats. Worldwide, rats and mice spread over 35 diseases. Rodent-borne diseases are spread directly to humans through bite wounds, consuming food or water that is contaminated with rodent feces, coming in contact with surface water contaminated with rodent urine, or through breathing in germs that may be present in rodent urine or droppings that have been stirred into the air (a process known as "aerosolization"). Diseases from rodents are also spread indirectly to humans

by way of ticks, mites, and fleas that transmit the infection to humans after feeding on infected rodents. In some cases, the rodents are the reservoirs (carriers) of the diseases, while in other cases the ticks, mites, or fleas act as the disease reservoirs.

1.83 “Safety” defined. Safety is the condition of being reasonably free from danger and hazards that may cause accidents or disease.

1.84 “Sanitized” defined. Sanitized means the treatment of equipment, utensils, and surfaces using a process which has been approved by the Health Authority as being effective in destroying pathogenic microorganisms.

1.85 “Service animal” defined. A service animal is any dog that is individually trained to do work or perform tasks for the benefit of an individual with a disability, including a physical, sensory, psychiatric, intellectual, or other mental disability.

1.86 “Sewage” defined. Sewage is the water-carried human or animal waste from residences, buildings, industrial establishments, feedlots or other places, together with such ground water infiltration and surface water as may be present. The term includes the mixture of sewage with wastes or industrial wastes and gray water.

1.87 “Significant water/moisture or chronic dampness” defined. Significant water/moisture or chronic dampness means:

- The presence of uncontrolled visible water or detectable moisture (measured as 95 percent relative humidity or higher) which persists for more than twenty-four (24) hours from an unmitigated source such as a roof leak, pipe leak or similar unexpected source; or
- Moisture may be present due to the water contained in warmer air condensing into droplets when it reaches dew point against a cooler surface such as a wall, causing detectable condensation.
- Moisture readings in wall and floor components that exceed recommended percentages for specific materials such as construction materials (12-16 percent) and wood (25 percent). While not absolutes, they may indicate a developing problem.
- The presence of uncontrolled visible water or detectable moisture (measured as 95 percent relative humidity or higher) which originates from the normal activities associated with a dwelling unit and continues on an ongoing basis; or
- Evidence of uncontrolled visible water or detectable moisture (unmeasured) indicated by the presence of visible mold.

1.88 “Smoke alarm” defined. A smoke alarm is a warning device that sets off a loud signal when excessive smoke, heat, or other visible or invisible products of combustion are detected. A smoke alarm is usually battery-operated, but may also be connected to a structure’s electrical system as a backup power source.

1.89 “Solid waste” defined. Solid waste is all putrescible and nonputrescible refuse in solid or semisolid form, including, but not limited to, garbage, rubbish, junk vehicles, ashes or incinerator residue, street refuse, dead animals, demolition waste, construction waste, and solid

or semisolid commercial and industrial waste. The term does not include hazardous waste managed pursuant to NRS 459.400 to 459.600, inclusive.

1.90 “Solid waste container” defined. A solid waste container is a watertight container that is constructed of metal, or other durable material impervious to rodents, that is capable of being serviced without creating unsanitary conditions, or such other containers as have been approved by the Health Authority. Openings into the container, such as covers and doors, shall be tight fitting.

1.91 “Sound condition” defined. Sound condition means any structure, building, or component that is in a condition to withstand designed or anticipated loads. This would include maintenance for weather protection, free of deterioration and damage.

1.92 “Space heater” defined. A space heater is a self-contained heating appliance of either the convection type or the radiant type and intended primarily to heat only a limited space or area such as one (1) room or two (2) adjoining rooms.

1.93 “Stairway” defined. A stairway is any grouping of stairs consisting of three or more risers.

1.94 “Structure” defined. Structure means that which is built or constructed, an edifice or building of any kind, or any piece of work artificially built up or composed of parts joined together in some definite manner.

1.95 “Substandard dwelling” defined. A substandard dwelling is any dwelling; house court; dormitory; public accommodation facility; apartment house; manufactured homes, mobile homes, or factory-built housing; which, through lack of maintenance or repair, generally endangers the life, limb, health, property, safety, or welfare of the public or the occupants thereof.

1.96 “Suitable barrier” defined. A suitable barrier is any barrier that is not easily deformed, non-climbable, and able to prevent entry or access into areas that present a hazard to children.

1.97 “Supplied” defined. Supplied means paid for, furnished by, provided by, or under the control of the property owner, Landlord, or other agent.

1.98 “Swimming pool” defined. A swimming pool is any structure intended for swimming or recreational bathing that is designed to contain water over eighteen (18) inches deep. This includes in-ground, aboveground and on-ground swimming pools; hot tubs; portable and non-portable spas; and fixed in-place wading pools. All swimming pool water must be maintained in a clear condition, which is free of algae, insects, debris, and in a sanitary condition.

1.99 “Tenant” defined. The tenant is a person entitled under a rental agreement to occupy a dwelling unit to the exclusion of others.

1.100 “Toxic substance” defined. A toxic substance is any chemical product applied on the surface of or incorporated into any structural or decorative material, or any other chemical, biological, or physical agent in the home environment or its immediate surroundings, which constitutes a potential hazard to human health at acute or chronic exposure levels.

1.101 “Vector” defined. A vector means an organism, usually an insect or other arthropod, rodent, or other animal, capable of transmitting the causative agents of human diseases or affecting public health and well-being.

1.102 “Vector-related public health nuisance (PHN)” defined. A vector-related public health nuisance (PHN) is any of the following:

- Any breeding place or harborage for mosquitoes, flies, other insects, or rats of public health importance which exists by reason of any use made of the land on which it is found, or any artificial or natural environmental change in the land’s condition.
- Presence of immature arthropods of public health importance shall constitute prima facie evidence that a place is a breeding place for arthropods.
- Any activity that supports the development, attraction, breeding, or harborage of vectors, or that facilitates the introduction or spread of vectors.

1.103 “Vegetation” defined. Vegetation is plant life of any kind, whether living or dead, characterized as grass, weeds, bushes, cacti, and trees.

1.104 “Water closet” defined. A water closet is an enclosed room or compartment containing a toilet bowl fitted with a mechanism for flushing.

Section 2

SUBSTANTIAL HAZARDS TO PUBLIC HEALTH AND SAFETY

2.1 The following section discusses conditions found in substandard dwellings and property, to the extent that the conditions on the property or in the dwelling endanger the life, limb, health, property, safety, or welfare of the public or the occupants thereof. Any building or part of a building including any dwelling unit, congregate residence, or the premises on which the dwelling is located, in which there exists any of the following listed conditions shall be declared to be a substantial hazard to public health and safety or substandard dwelling.

2.2 It is the responsibility of the Landlord to provide a dwelling unit that is habitable and in good condition, free of substantial hazards to health and safety, upon the initial commencement of the rental agreement with the tenant. The Landlord shall make reasonable attempts to maintain the dwelling unit or congregate residence in a good and habitable condition that does not present any of the substantial health and safety hazards in this Section.

2.3 Tenants and their authorized guests shall maintain the part of the dwelling unit or congregate residence which they occupy in a clean and safe condition, which does not constitute a substantial hazard to health and safety.

2.3.1 Tenants shall not deliberately or negligently render the premises uninhabitable, or conduct themselves in a manner that constitutes a PHN.

2.3.2 Tenants shall cooperate with the agents of the Health Authority and the Landlord in assessing and attempting to resolve any health hazards allegedly present in the dwelling unit.

2.3.3 Substantial sanitation hazards include, but are not limited to:

2.3.3.1 Lack of, or improper flush toilet, hand washing sink, and bathtub or shower in a dwelling unit.

2.3.3.2 Insufficient flush toilets, hand washing sinks, and bathtubs or showers per number of occupants in a dwelling.

2.3.3.3 Lack of hot and/or cold running water to plumbing fixtures in a dwelling unit or congregate residence.

2.3.3.4 Moisture intrusion or chronic dampness in habitable rooms.

2.3.3.5 Infestation, harborage, or propagation of insects, vermin, or rodents.

2.3.3.6 Lack of connection to a required sewage disposal system.

2.3.3.7 Lack of adequate solid waste storage and removal facilities.

2.3.4 Structural hazards that have led or may lead to the presence of substantial health and safety hazards, include, but are not limited to:

2.3.4.1 Deteriorated building foundations, which allow pests or moisture to enter or cause any other determinable substantial hazard to health and safety.

2.3.4.2 Defective or deteriorated flooring, floor supports, stairways, and railings, which are likely to cause injury.

2.3.4.3 Structural defects to walls, ceilings, windows, or other parts of the dwelling, which have led or are likely to lead to substantial injury or illness of dwelling occupants.

2.3.4.4 Fireplaces or chimneys that have deteriorated to the point where they cannot be safely used to heat the dwelling or remove the products of combustion.

2.3.4.5 Substantial damage to the structure caused by earthquake, wind, fire, rain, or flood, or any other condition(s) causing structural damage, which renders the dwelling unsafe for occupancy.

2.3.5 Substantial electrical hazards that have led or may lead to electrical shock, electrocution, or fire, which include, but are not limited to:

2.3.5.1 Wiring that is visibly in poor and unsafe condition and not working properly, such as frayed cords, broken plugs, plugs missing a grounding pin where one was present originally, etc.

2.3.5.2 Exposed wiring, such as lack of faceplates over live wires, etc.

2.3.5.3 Broken electrical fixtures which cannot be readily removed from service.

2.3.5.4 Any other condition involving electrical wiring or fixtures, which poses an obvious shock or electrocution hazard to a reasonably knowledgeable person.

2.3.6 Substantial plumbing and water hazards include, but are not limited to:

2.3.6.1 Plumbing that is in a poor and unsafe condition and not working properly, e.g., a defect or condition exists in the system supplying potable water that may result in the contamination of the water.

2.3.6.2 A cross-connection between the potable and non-potable water distribution systems, such as landscape irrigation, air conditioning, heating, and/or fire suppression.

2.3.6.3 A back siphonage between fixtures or systems, including potable and non-potable water or sewerage systems.

2.3.6.4 Sewage that is not disposed of in an approved and sanitary manner.

2.3.7 Substantial mechanical, fire, chemical, physical, waste, and miscellaneous hazards include, but are not limited to:

2.3.7.1 Mechanical equipment and associated vents, which are, at the time of observation, in poor and unsafe condition or are working in a manner that poses an immediate threat to life or health or conditions that pose an immediate threat of severe exposure to contaminants, which are likely to have adverse cumulative or delayed effects on health.

2.3.7.2 Lack of adequate heating and/or cooling systems, improper ventilation, or operation of required ventilating equipment leading to unhealthy or unsafe ambient temperatures or air contaminant levels within the dwelling.

2.3.7.3 Safe ambient room temperatures are between sixty (60° F) and ninety (90° F) in all rooms and areas within the dwelling, while the rooms and areas are occupied.

2.3.7.4 Furnaces and central heating units that are not capable of warming the dwelling to sixty (60° F) or above in the winter, when operated at maximum heating capacity, are considered substantial hazards, because a lack of adequate heating may lead to hypothermia in susceptible individuals. Cooking appliances may not be used to supply heat.

2.3.7.5 Air conditioning units that are not able to cool the dwelling to ninety (90° F) or below in summer, when operated at maximum cooling capacity, are considered substantial health hazards, because a lack of adequate cooling may lead to hyperthermia in susceptible individuals.

2.3.7.6 Consideration is given to seasonal fluctuations in the weather and short-term [less than two (2) hours] episodes, which fall outside the indicated temperature ranges. If the time period exceeds two (2) hours, then the condition must be identified and corrected as soon as reasonably possible. Fans and fire-safe space heaters may be used as a short-term, temporary measure in the interim.

2.3.7.6.1 Any space heaters used pursuant to this section must comply with the requirements of Section 3.8 and any applicable building code and local jurisdiction requirements.

2.3.7.6.2 The floor areas immediately adjacent to where such heaters are used must be kept clean and clear of combustible materials.

2.3.7.7 Obvious fire hazards, including high-risk situations where there are no or grossly insufficient means of egress from the structure should a fire occur.

2.3.7.8 Missing or inoperable smoke detection or fire suppression equipment.

2.3.7.9 The detectable presence of toxic or noxious gases, vapor, fumes, mists, or particulates in concentrations immediately dangerous to life or health, or in concentrations sufficient to cause an environmental disease or a public nuisance.

2.3.7.10 Missing or inoperable carbon monoxide detection equipment.

2.3.7.11 The presence of, within the dwelling or on the grounds of a dwelling, any pesticide not approved by the EPA, including evidence of indiscriminate use of a pesticide or herbicide which may be injurious to the health of humans.

2.3.7.12 Premises that are poorly maintained, containing conditions, which present an imminent risk of entrapment, fall, puncture, pinch, crush, trip, or other cause of serious injury.

2.3.7.13 Bodies of water lacking approved barriers, covers, and/or alarms, which cause an imminent and observable risk of drowning in dwellings that are not otherwise governed by the Southern Nevada Pool Code.

2.3.7.14 All illegal clandestine drug laboratories and related activities.

2.4 In addition to conditions that constitute an immediate and substantial hazard to public health and safety as listed in Section 2.3, there may exist deficiencies that create substandard living conditions, but that are not immediately dangerous to life or health. Such conditions include, but are not limited to:

2.4.1 Lack of or improper kitchen sink.

2.4.2 Lack of required electrical lighting.

2.4.3 Lack of minimum amounts of natural light.

2.4.4 Faulty weather protection, which includes, but is not limited to:

2.4.4.1 Visibly deteriorated, crumbling, or loose plaster (e.g., light can be seen inside the structure, coming through the exterior walls).

2.4.4.2 Deteriorated or ineffective waterproofing of exterior walls, roof, foundations, or floors, including broken windows or doors.

2.4.4.3 Defective or lack of weather protection for exterior wall coverings, including lack of paint, or weathering due to lack of paint or other approved protective covering.

2.4.4.4 Broken, rotted, split, or buckled exterior wall coverings or roof coverings.

2.4.5 Materials of construction identified as being hazardous to public health such as lead-based paint, asbestos, and formaldehyde and presenting a potential, but not imminent, health hazard.

2.4.6 Those premises on which there is an accumulation of weeds, vegetation, junk, dead organic matter, debris, garbage, offal, rodent harborages, stagnant water, combustible materials, and similar materials or conditions that constitute fire, health, or safety hazards.

2.4.7 The presence of uncontrolled putrescible waste within the dwelling, on the facility grounds, or in waste accumulation and disposal areas in a quantity and duration to create a nuisance.

2.4.8 Toxic chemicals improperly labeled, stored, or used throughout dwelling properties or on the dwelling grounds.

2.4.9 Inadequate exit facilities for the dwelling's occupant load, or blocked exit facilities, such as permanently-barred windows and doors, leading to the potential of injury during a fire or other emergency due to lack of sufficient points of egress.

2.4.10 All buildings or portions thereof occupied for living, sleeping, cooking, or dining purposes that were not designed or intended to be used for those occupancies (e.g., laundry rooms, utility closets, boiler rooms, etc.).

2.5 Whenever the Health Authority finds an unsafe, unsanitary, or other condition(s) in the operation, environment, equipment or structure of a rented dwelling which may constitute a hazard to public health and safety, the Health Authority may require that the condition(s) be remediated or abated.

Section 3

FACILITIES AND EQUIPMENT

3.1 Improper occupancy

All buildings or portions thereof occupied for living, sleeping, cooking, or dining purposes that were not designed or intended to be used for such occupancies shall be considered substandard. It is unlawful for any person to use, or to permit another person to use, any of the following portions of a dwelling for sleeping purposes:

3.1.1 Any kitchen, unfinished cellar or basement, hallway, water closet, bath, shower compartment, or slop-sink room.

3.1.2 Any other room or place, which does not comply with the provisions of this section; or which, in the judgment of the Health Authority, living or sleeping is dangerous or potentially harmful to life or health by reason of an overcrowded condition caused by exceeding permissible occupancy limits; a lack of light, windows, ventilation or drainage; the presence of dampness, offensive or obnoxious odors, or poisonous gases in the room or place; or a lack of useable points of egress should a fire or other emergency occur.

3.2 Shelter and weather protection

3.2.1 Every dwelling unit or congregate residence shall be weather protected to provide shelter for the occupants against the elements and to exclude dampness.

3.2.2 Plaster, stucco, shakes, shingles, paint, or other protective coatings on the exterior of the buildings shall be present and in good condition, without crumbling, bare spots, breakage, rotting, splitting, buckling, or other deterioration, which interfere with the building's waterproofing.

3.2.3 Roofs, foundations, floors, windows, or doors shall be in good condition and able to exclude outside moisture and other weather-related hazards.

3.3 Floors

Every floor and every floor covering, such as carpeting, vinyl flooring, wood, wood substitute, or tile must be kept clean and in good repair, sanitized, or replaced, as needed, so that it will not become a hazard to safety or health.

3.3.1 The floors in areas used for washing and sanitizing tableware, laundry areas, kitchens, bathrooms, and water closets must be constructed of durable and easily cleanable material.

3.3.2 The Health Authority may direct the remediation of flooring or carpeting in any area where the use of carpeting or other absorbent flooring material has caused unsanitary conditions to develop. Examples include, but are not limited to, carpeting or absorbent flooring material around toilets, in kitchens, in laundry rooms, or around ice machines.

3.3.3 All installed flooring must be fitted snugly at the junctures between the floor and the walls so there are no openings large enough to permit the entrance of vermin.

3.4 Walls, ceilings and closures

3.4.1 All walls, ceilings, doors, windows, skylights, other closures, and fixtures must be kept clean and in good repair.

3.4.2 The walls of bathrooms, water closets, and kitchens must be smooth and easily cleanable.

3.4.3 The materials used in constructing the walls and ceilings must be joined along their edges so as to leave no open spaces or cracks.

3.4.4 Studs, joists, rafters, and beams must not be left exposed in bathrooms, restrooms, water closets, laundry rooms, or kitchens. If left exposed in other areas, these structural members must be suitably finished and be kept clean and in good repair.

3.5 Furniture

3.5.1 All furniture provided by the Landlord must be in good repair, clean, and free of unsanitary conditions upon commencement of tenancy.

3.5.2 Once tenancy begins, the provided furniture must be maintained in reasonably good repair by the tenant, allowing for normal use.

3.5.3 Environmental surfaces, furnishings, mats, pillows, cushions, linens, chairs, or other items within the dwelling unit provided by the Landlord as part of the rental of a dwelling that are stained with blood or bodily fluids, soiled, or infested with vermin such as bedbugs, lice, or other pests or are in an otherwise unsanitary condition must be removed from service immediately.

3.6 Electricity and illumination

3.6.1 All electrical equipment, wiring, and appliances must be installed and maintained in a safe manner.

3.6.2 At least twenty (20) foot-candles of light must be provided in each kitchen, water closet, bathroom, laundromat area for tenant use, and in each other area during cleaning.

3.6.3 All public hallways, stairs, and other exit ways shall be adequately lighted at all times and at no point shall the light level be less than three (3) foot-candles of light upon the surface of the stairway steps.

3.6.4 If the room is used for living or sleeping, it must have a means of illumination during both daylight and night hours.

3.6.5 Every water closet compartment, bathroom, laundry room, furnace room, and public hallway shall contain at least one (1) electrical light fixture.

3.6.6 In addition, there must be natural light from a window in a habitable area of the dwelling.

3.6.7 The Landlord of a dwelling or dwelling unit constructed prior to 1978 must not allow interior paint to become in a state of disrepair; this includes but is not limited to cracking, peeling, flaking, or the forming of paint dust. Abatement of lead-based paint deficiencies must be conducted in accordance with local, state, and federal regulations. The Health Authority may grant an exemption to these Regulations if an accredited laboratory confirms the non-existence of lead-based paint in the interior of the premises.

3.7 Smoke alarms and carbon monoxide detectors

3.7.1 Upon the commencement of a tenancy, each distinct sleeping or living room must be equipped with at least one (1) working smoke alarm, which is installed, maintained, and tested according to existing fire codes.

3.7.2 The smoke alarm must be free of foreign matter such as tape or paint that could impair its proper function.

3.7.3 Each area requiring a carbon monoxide detector as per existing fire codes must have such a device present and in working order.

3.8 Heating and ventilating systems

3.8.1 All bathrooms and water closets must be adequately ventilated so that excessive moisture is removed from the room.

3.8.2 Each system for heating, cooling, or ventilation must be properly maintained and operational at all times that the dwelling is occupied.

3.8.3 Space heaters, gas heaters, and/or propane heaters with open coils, fuel combustion, or flames are not allowed to be provided by the Landlord to the tenant as a substitute for proper, functioning central heating. Modern space heaters, which are properly certified for safe, residential use by a third-party certification organization may be provided to the tenant as a supplemental and temporary measure only.

3.8.4 The optimal temperature for all sleeping rooms, bathrooms, and water closets is between sixty-eight (68° F) and eighty (80° F) while being used by tenants. In no event can the temperature remain below sixty (60° F) in the winter, as per Section 2.3.7.4, or exceed ninety (90° F) in the summer, as per Section 2.3.7.5, for more than two-hour temporary intervals due to inadequately functioning heating and cooling equipment systems.

3.9 Baths, showers, toilets, and hand washing sinks

3.9.1 Each dwelling must contain, at a minimum, one (1) working flush toilet, one (1) hand washing sink, and one (1) shower and/or bathtub, which may include a bathtub/shower combination.

3.9.2 All baths, showers, toilets, and hand washing sinks must be kept in good repair.

3.9.3 All under-the-counter cabinets where plumbing is present must be maintained in a clean, dry, and structurally sound condition. The cabinets must be replaced if the understructure shows warping, peeling, rotting, or a similar deteriorating condition.

3.10 Water supply

3.10.1 The potable water supply for each dwelling must be from a source approved by the State of Nevada Division of Environmental Protection, Bureau of Safe Drinking Water and must meet all NRS Chapter 445A requirements.

3.10.2 Each dwelling must be supplied with or have available a hot and cold potable water supply that meets all sanitary purposes, including, but not limited to water for drinking, toileting, hand washing, bathing, culinary use, warewashing, cleaning and disinfection, and laundering.

3.10.3 The potable water system must be installed and maintained in such a manner that there is no cross connection between it and any other system.

3.11 Water damage/chronic dampness evaluation

3.11.1 Habitable rooms shall be free of chronic dampness.

3.11.2 Whenever evidence of significant water/moisture intrusion or chronic dampness from any source is found within or on the walls, ceilings, attic spaces, crawl spaces, floors, carpeted surfaces, ventilation ducts, insulation, or other materials or areas which may promote the growth of mold, the source of the water or moisture must be identified and stopped to prevent or reduce mold growth and the condition must be remediated.

3.11.3 The Health Authority will identify the condition and note the same on the inspection report, which will be provided to both the Landlord and tenant.

3.12 Solid waste disposal

3.12.1 Each dwelling unit or apartment house must have solid waste containers of sufficient number and size to store all the solid waste in a manner that does not exceed the waste container's capacity until the solid waste is removed for final disposal.

3.12.2 If the solid waste is not being removed in a manner that prevents a PHN or danger, the Health Authority may direct the Landlord to increase their solid waste container capacity and/or increase the frequency of scheduled pickups until adequate removal of the solid waste is achieved.

3.12.3 The solid waste containers must be:

3.12.3.1 Emptied at least once weekly. The frequency of solid waste removal must be at an interval which prevents putrescible waste from becoming a nuisance even if such frequency is more often than once weekly.

3.12.3.2 Kept covered and closed with a tight fitting lid at all times except when being filled, emptied, or cleaned, unless the equipment is specifically designed to be operated as an open dumpster or trash compactor, in order to prevent attracting pests or causing other PHNs.

3.13 Sewage disposal

3.13.1 All sewage carried by water must be disposed of by means of public sewerage or by a system for disposal such as an Individual Sewage Disposal System (ISDS), which is approved by the Health Authority.

3.13.2 If the dwelling unit intends to discharge its sewage to an ISDS, the facility must submit plans for review and approval and obtain a permit for the ISDS from the Health Authority for that purpose.

3.13.3 Any sewage discharge, sewer pipe leaks, spills, or backflow onto the ground must be stopped and/or contained immediately.

3.13.4 All sewage spills must be remediated in a manner that eliminates potential disease transmission, offensive odors, sewage solids, and sewage litter.

3.14 Grounds and outdoor areas

3.14.1 Those grounds and areas available for common use by all tenants and their guests including, but not limited to: parking areas, walkways, stairways, hallways, landscaped areas, child play grounds, storage areas, service buildings, the exterior of the structure, and undeveloped grounds must be kept clean, in good repair, and free of any health and safety hazards such as refuse, litter, animal droppings, insect and rodent harborages, weed overgrowth, and unused equipment. Outdoor areas must have sufficient drainage to prevent water from collecting and stagnating in pools.

3.14.2 Sharp tools, lawn mowers, power saws, other potentially dangerous tools or equipment, pesticides, and other toxic substances under the control of the Landlord must be maintained inaccessible to everyone except authorized personnel. Storage sheds shall be locked at all times.

3.15 Loss of critical systems

The Landlord must immediately initiate the process of identifying and repairing the cause of the loss of critical systems such as electrical power, natural gas, water, sewage disposal, artificial lighting, heating, cooling, or ventilation controls identified by the tenant and reported to the

Landlord.

Section 4

GENERAL SANITATION

4.1 Public areas

All public areas of dwelling units, congregate residences, apartment houses, multi-family dwellings, house courts, etc., must be maintained in a clean and sanitary manner, free of nuisances.

4.2 Public restrooms

4.2.1 All public restrooms must be kept in sanitary condition and good repair.

4.2.2 The floors of all public restrooms must be thoroughly cleaned and sanitized at least daily.

4.2.3 All surfaces of toilets, urinals, and other fixtures which may come in contact with a person's body or bodily fluids in a public restroom, must be cleaned and sanitized at least daily. Any other surfaces not specifically listed must be maintained in a clean condition.

4.2.4 All public restrooms must be stocked and maintained with a sufficient supply of toilet paper, disposable paper or single-use cloth towels, and liquid soap dispensed from easily cleanable permanent wall or counter-mounted dispensers.

4.2.5 Cloth towels provided in public restrooms for use by tenants or guests must be dispensed in a manner that clearly facilitates single use prior to laundering. If cloth towels are provided for this purpose, they must be stored for use, dispensed, and stored for re-laundering in a sanitary manner.

4.3 Bedding, linen, and towels provided by Landlord to tenant

When bedding, linen, towels, and housekeeping services are contractually provided by the Landlord to the tenant as part of the rental agreement:

4.3.1 All tenant bathrooms must be provided with a sufficient supply of clean towels.

4.3.2 There must be a sufficient supply of appropriately sized clean bedding for each bed while the dwelling unit is rented.

4.3.3 Sheets and pillow cases provided must be replaced at least weekly, at the reasonable request of a tenant, between tenants, or whenever they have become soiled or are in disrepair.

4.3.4 All items of bedding, linen, and towels must be protected from contamination by dust or filth. They must be laundered, folded, and stored in an area that is clean and well maintained.

4.3.5 Separate storage areas must be designated for soiled bedding, linen, and towels away from clean bedding, linen, and towels.

4.3.6 Laundered bedding, linen, and towels must be stored at least six (6) inches above the floor level in a clean, ventilated, illuminated, and well-maintained place until used.

4.3.7 Clean bedding that is found to be in poor condition during the room make-up process must be discarded and replaced.

4.3.8 Prior to their next use, bedding, linens, and towels must be washed with soap or detergent and sanitized with a product labeled for that use.

4.3.9 Clean linen and bedding must not be stored or transported in laundry bags, laundry carts, or other containers which have been used for soiled linen unless the Landlord demonstrates to the Health Authority that the containers are, or can be, properly cleaned and their surfaces sanitized.

4.4 Third-party linen provider

When bedding, linen, towels, and housekeeping services are contractually provided by the Landlord to the tenant as part of the rental agreement; then bedding, linens, towels, as well as any conveyances, that are found to be dirty, stained, or otherwise in poor condition must be rejected and returned to the third-party linen provider.

4.5 On-site laundry facilities in multi-family dwellings

When community laundry facilities are provided for multi-family dwellings:

4.5.1 There must be an adequate hot water supply to the on-site laundry facilities.

4.5.2 There must be a reasonable number of washing machines, dryers, and folding tables to handle the volume of laundry generated at the multi-family dwelling unit. Such approved equipment must be installed or placed:

4.5.2.1 With a drain indirectly connected to sewer;

4.5.2.2 On, at a minimum, a composite tile or other approved floor, with wall-to-floor junctures sealed with base coving;

4.5.2.3 In a room with a minimum fifty (50) foot-candles of light measured thirty (30) inches above the floor;

4.5.2.4 On adjacent walls with coverings of fiberglass-reinforced plastic paneling or equivalent where moisture is likely to occur; and

4.5.2.5 In a room with an enclosed ceiling, finished with a cleanable surface.

4.5.3 Washing machines, dryers, and folding tables must be maintained in good operating condition.

4.5.4 Laundry storage shelves or cabinets must be constructed of smooth, non-porous, corrosion, and water damage-resistant material.

4.5.5 Existing wooden or combination metal/wood shelving must be sealed with an enamel sealing paint or clear coat and the shelves must be maintained in an easily cleanable condition.

4.6 Maintenance and chemical storage areas

4.6.1 Maintenance and chemical storage areas shall be well maintained.

4.6.2 Chemical storage and use shall be conducted in accordance with manufacturer's instructions.

4.6.3 Maintenance and chemical storage areas must be maintained inaccessible to children and any unauthorized persons.

4.6.4 Maintenance areas in multi-family dwelling complexes where chemicals are processed or mixed shall have a sink supplied with hot and cold running water and dispenser-fed liquid soap and disposable towels.

4.7 Housekeeping carts

If housekeeping services are provided and housekeeping carts are used:

4.7.1 Each cart must be maintained in good working, clean, and sanitary condition.

4.7.2 Clean items shall not come into contact with any soiled articles or chemicals on the cart.

4.7.3 Each cart used for the combined delivery of clean articles and removal of items for laundering must have a separate storage bin or bag for the soiled articles. The storage bin must be made of a cleanable, smooth, and impervious material and storage bags must be made of a durable machine washable material unless the bag is for single use only.

4.7.4 Laundry storage bins and bags must be washed whenever they become visibly dirty.

4.7.5 All containers of chemicals used for maintaining dwelling units must be appropriately labeled.

4.8 Ice

4.8.1 All ice-making machines must be certified for the level of their intended use (e.g., single-family use or multiple-household use) and located, installed, operated, and maintained so as to prevent contamination of the ice.

4.8.2 Ice provided in a dwelling unit must be made of water obtained from a water supply approved as per Section 3.10.

4.8.3 Ice machines that are provided for direct use by multiple tenants must be designed to dispense ice cubes automatically from a storage area, which is within the machine and inaccessible to the tenants.

4.8.4 The Landlord or assigned maintenance staff must have and adhere to an appropriate routine maintenance and cleaning schedule for multiple-household ice machines.

4.8.5 Unless of a disposable/single-use type, ice buckets, ice scoops and other containers and utensils used for ice must be made of a smooth, impervious material and designed to permit effective cleaning. Such containers and utensils must be cleaned and sanitized between tenants, and must be stored and handled in a sanitary manner.

4.9 Pets and service animals

4.9.1 No pet or service animal may be allowed to create a nuisance.

4.9.2 Tenants of multi-family dwellings and congregate residences are responsible for their own pets and shall use available dog runs and clean up the wastes of their animals so that they do not create a nuisance or public health hazard to the other tenants and members of the public.

4.9.3 The Landlord shall not allow or permit tenants to have animals that are not appropriate for the zoning of the property in which the dwelling is located. Such animals may include fowl and livestock.

4.9.4 Animal wastes must be properly cleaned up as often as necessary to prevent nuisances, odors, and transmission of zoonotic diseases.

4.9.5 The Health Authority may notify the animal control agency of jurisdiction, as appropriate, should nuisance or improper zoning conditions be identified. For routine pet-related nuisances, (e.g., pet waste disposal problems), the Health Authority may request that the Landlord and/or tenant resolve their animal issues prior to notification of animal control. If the issue remains unresolved, then the animal control agency of the appropriate jurisdiction may be notified by the Health Authority for further enforcement action.

Section 5

CONTROL OF VECTORS

5.1 General provisions and preventive measures

5.1.1 The Landlord must implement reasonable measures to control insects, rodents, and other vectors, which are in accordance with accepted and current pest control standards and practices.

5.1.2 Corrective engineering measures may be required by the Health Authority whenever a pest control problem is identified. Such measures may include, but not be limited to, requiring the Landlord to engage the services of a licensed pest control operator.

5.1.3 The Landlord must not accumulate garbage, refuse, or any materials that may serve as food or harborage for vermin.

5.1.4 All exterior openings of a dwelling must be protected to prevent access of or by rodents, flies and other vectors. Such protection may include tight-fitting, self-closing exit doors and screened or closed windows.

5.1.5 The interior and exterior of a dwelling must be maintained in a condition which will prevent the harborage or feeding of vermin. The tenant must maintain their rental dwelling in a clean and sanitary condition that reduces the likelihood that an infestation may be established.

5.1.6 Dwellings, common areas, and other areas surrounding a dwelling found to have live rodents, cockroaches, bed bugs, or other vermin in type and number to cause a vector-related PHN must be remediated as soon as reasonably possible.

5.1.7 The feeding of feral birds and animals, which causes a public nuisance, is prohibited.

5.2 Pest control application

5.2.1 Only pesticides approved by the State of Nevada Department of Agriculture for use in dwellings may be used.

5.2.2 All pesticides must be used in accordance with the manufacturer's recommended directions and labeling instructions and stored in a safe manner.

5.2.3 Any pesticides stored on-site must be stored in a chemical storage area, inaccessible to children and unauthorized persons.

5.2.4 The Landlord must notify tenants a minimum three (3) business days in advance prior to the routine application of any pesticides in the dwelling unit.

5.2.5 An emergency situation may be determined to exist by the Health Authority and may require treatment for pests sooner than three (3) business days as noted in Section 5.2.4. If such an emergency pesticide application or other emergency intervention is required, the tenants who may be affected shall be notified by the Health Authority or the Landlord, if directed to do so by the Health Authority, verbally or in writing as soon as possible.

5.2.6 Notification must include information about all required tenant preparations prior to pesticide application and recommended tenant reentry and cleaning actions following the application. Documentation of the manner of notification and to whom the notification was given must be maintained by the Landlord.

5.2.7 If the inspection for the presence of pests by a licensed pest control operator is requested by the Landlord in response to a complaint submitted by a tenant, then notification is implied and the pest control operator may apply pesticides at the time of the inspection, unless there is a valid reason why the pesticides cannot be applied at that time.

5.2.8 Situations that may require advanced notice and coordination include the presence of individuals who may be most adversely affected by pesticide application; including children, the

elderly, other susceptible individuals, or pets. The Landlord, in coordination with the tenant and the licensed pest control operator, shall determine a time at which the pesticides may be applied.

5.2.9 Application of pesticides should be conducted when tenants are not present in the dwelling and should be done only in unoccupied rooms.

5.2.10 Tenants must cooperate with the Landlord and the Health Authority, as directed, when given proper notification of pending pesticide applications or when the Landlord is responding to a tenant complaint.

5.2.11 Any activities involving fumigation must be performed in compliance with NRS Chapter 555 and NAC Chapter 555. Information regarding NRS Chapter 555 and NAC Chapter 555 is located in Appendix A.

5.3 Rodent waste clean-up

5.3.1 All rodent waste clean-up must be completed in a manner which reduces the disturbance of rodent feces, urine, saliva particles, and associated mists.

5.3.2 Appropriate respiratory protection must be provided for any employee involved in rodent waste clean-up consistent with current U.S. Centers for Disease Control and Prevention recommendations. See Appendix B.

5.4 Record keeping

The Landlord must retain maintain a copy of all records documenting the receipt of pest control services from a licensed commercial applicator or the pesticide application records generated by an on-site applicator who is in the employ of the Landlord, for a minimum of two (2) years from the date of service or longer if otherwise required by applicable law. Records will be maintained and made available for review by the Health Authority during regular business hours.

Section 6

INSPECTIONS

6.1 Inspections and Investigations

6.1.1 The Health Authority is authorized to perform inspections, investigations, reviews, and other actions deemed necessary to ensure compliance with these Regulations.

6.1.2 After the initial complaint or incident response, an inspection or official visit may be made as often as the Health Authority determines is necessary to ensure compliance with corrective actions associated with validated complaints, concerns, or hazards identified by the

Health Authority.

6.2 Health Authority identification

When responding to a tenant complaint or to the report of any other alleged health hazard (e.g., a sewage spill affecting public areas or uncontrolled accumulated solid waste visible or otherwise detectable to any person near the affected property), Health Authority agents will show their Health Authority-issued official identification to the Landlord, tenant, and/or designated responsible person upon entering a dwelling to make an inspection or conduct other business pursuant to these Regulations.

6.3 Responsible person must provide immediate access to Health Authority

6.3.1 Upon showing identification pursuant to Section 6.2, the Health Authority must be provided immediate access to the dwelling and/or other area in question to perform an inspection or conduct other work pursuant to these Regulations.

6.3.2 Any unreasonable denial of access by the Landlord or tenant to any area of the dwelling, maintenance rooms, laundry rooms, storage areas, common areas, or any other areas requiring sanitation inspection or investigation by Health Authority agents may result in immediate enforcement actions.

6.4 Unlawful to interfere with or intimidate Health Authority agents

6.4.1 Pursuant to both NRS 197.090 and NRS 199.300, it is unlawful for any person to interfere with Health Authority agents in the performance of their duties or to directly or indirectly address any threat or intimidation to a Health Authority agent, with the intent to induce such an agent contrary to his or her duties.

6.4.2 Attempts to interfere with or intimidate a Health Authority agent may result in immediate enforcement actions by the Health Authority.

6.5 Inspection Report

6.5.1 The Health Authority agent will prepare an inspection report describing any findings, including any deficiencies identified during the inspection.

6.5.2 A copy of the completed inspection report will be furnished to the Landlord and the tenant.

6.6 Corrective actions for inspection deficiencies

6.6.1 The Landlord must ensure that health, safety, and sanitation violations are corrected as directed by the Health Authority. The health and safety of tenants must not be compromised during corrective actions such as remodeling and renovation; mold, asbestos or lead-based paint removal; or other similar activities.

6.6.2 Verified complaints may result in the application of the verified complaint fee, as indicated on the Health Authority's current Environmental Health Division Fee Schedule. The current fee schedule is available on the SNHD website, www.SNHD.info.

6.6.3 When the dwelling unit is found to have a substantial health hazard present which cannot be corrected while the tenant is living in the dwelling, the tenant must be relocated while deficiencies are being corrected. Depending upon the extent and severity of the substantial health hazard, the Health Authority may determine if relocation of tenants is necessary until corrective actions are completed.

6.6.4 The dwelling shall be posted as substandard and unfit for occupancy until the substantial health hazard is remediated.

6.6.5 The Health Authority shall issue a Notice and Order for the Landlord to correct the substantial health hazard. Failure of the tenant to cooperate with the Landlord in the resolution of a substantial health hazard will be documented by the Health Authority on their inspection reports.

6.6.6 Violations that constitute a substantial threat to public health and safety and their remedies are addressed in Section 2 of these Regulations.

6.6.7 Deficiencies may be present that do not constitute a substantial threat to public health and safety. Corrective actions for these types of deficiencies shall be noted on the inspection report and be assigned a specified period of time within which the indicated corrections must be completed.

Section 7

ENFORCEMENT

7.1 Civil enforcement

Once the Health Authority has inspected or investigated any property and believes the Landlord in violation of these Regulations or has otherwise failed to comply with these Regulations, the Health Authority may take civil enforcement action as authorized by statute, rule, ordinance, and regulation and may also refer the matter for criminal prosecution. Civil enforcement may involve court or administrative actions, injunctive actions, and closures and may involve cost recovery, penalties, and other remedies.

7.2 Correction of violations

7.2.1 The Landlord shall correct the conditions which resulted in the violation(s) by the date indicated on the inspection report. Unless otherwise noted on the inspection report, all violations shall be corrected within thirty (30) days.

7.2.2 When corrective actions cannot be completed by the indicated date, the Landlord shall contact the Health Authority prior to the reinspection date to reschedule the date. A new reinspection date may be provided if the Health Authority determines that the new reinspection date will not adversely affect the health and well-being of the tenants or the public. A reinspection fee, as indicated on the SNHD Environmental Health Division Fee Schedule shall be assessed when the same violations are observed on the subsequent reinspection.

7.2.3 When circumstances warrant, because of the seriousness of the hazard, the Health Authority may act to correct or abate the emergency without issuance of a Notice or Order or without waiting for the expiration of compliance time previously given in Notice or Order.

7.3 Failure to correct a deficiency

7.3.1 Failure to correct a deficiency within the period specified in the written report or within the time frame established as a new reinspection date by the Landlord and Health Authority is a violation of these Regulations. Documented, repeat violations will result in assessment of reinspection fees and issuance of a Notice and Order to correct the deficiencies.

7.3.2 Failure to correct the deficiencies by the date noted in the Notice and Order issued may result in institution of further legal remedies, summons before an Administrative Hearing Officer, and/or administrative cost recovery.

7.4 Repeated non-compliance

Continued non-compliance; serious, repeated violations; or a history of repeat violations of these Regulations may, in the Health Authority's discretion, result in one (1) or more of the following actions:

7.4.1 A letter of warning to the Landlord outlining the health, safety, or sanitation concerns, with a copy of the letter sent to the relevant agency of jurisdiction or Licensing Authority, such as business licensing or code enforcement.

7.4.2 A required supervisory conference to review violations and remedial actions.

7.4.3 Temporary closure of a dwelling unit, including any associated fees.

7.4.4 Any other action deemed necessary and appropriate in furtherance of these regulations.

7.5 Notices, Cease and Desist Orders, and closures

7.5.1 A Cease and Desist Order may be issued whenever there exists, in the Health Authority's judgment, a condition in the operation of a dwelling unit, common area, maintenance room, storage area, or similar location which constitutes a substantial health hazard to the public health.

7.5.2 The Cease and Desist Order will cite the deficiencies identified, specify the corrective action to be taken, and the time within which the corrective action must be taken.

7.5.3 Any dwelling unit subject to a Cease and Desist Order or entirely closed due to a substantial health hazard must pay a reinspection fee and closure fee prior to requesting a reopening inspection of the area(s) in question.

7.5.4 Within ten (10) days following receipt of a written a statement signed by the Landlord asserting that, in the opinion of Landlord, the conditions causing the violation have been corrected, the Health Authority may make a reinspection.

7.5.4.1 In addition, the Cease and Desist Order may state that any related Health Permit, such as a pool or spa Health Permit, which is directly tied to the substantial health hazard, is immediately suspended and all operations related thereto must cease and desist immediately. The Landlord to whom such a Health Permit-related Cease and Desist Order is issued shall comply with it immediately.

7.5.4.2 The Health Permit may be suspended for cause pending its revocation or an administrative hearing.

7.5.4.3 The Notice or Order will also advise that an administrative hearing will be provided if a written request for a hearing is filed by the Landlord with the Health Authority within the time period stated in the Notice or Order.

7.5.4.4 Upon timely written request to the Health Authority, the Landlord will be afforded a hearing as soon as possible.

7.5.4.5 Any Landlord who has had a Health Permit suspended may, at any time, make application for a reinspection for reinstatement of the Health Permit.

7.5.5 If upon reinspection the Health Authority determines that the Landlord is complying with the requirements of these Regulations, the Health Permit will be reinstated or the dwelling made available for occupancy.

7.5.6 If upon reinspection the condition(s) for which the Cease and Desist Order was written, the Order stays in effect and further actions may be taken to cause compliance with these Regulations. The Landlord must pay additional reinspection fees prior to requesting another reopening inspection of the area(s) in question.

7.6 Administrative hearing process

7.6.1 A party aggrieved by a Notice or Order may request an administrative hearing in writing within ten (10) days of the date of receipt of the Notice or Order.

7.6.2 Administrative Hearings will be conducted in accordance with the Health Authority's Administrative Hearing Procedures.

Section 8

MISCELLANEOUS

8.1 Severability

Should any section, paragraph, sentence, phrase, or provision of these Regulations be held invalid for any reason, the remainder of these Regulations shall not be affected.

8.2 Disclosure requirements

Upon request, the Landlord must provide a copy of these Regulations to the tenant of any dwelling.

8.3 Effective date

8.3.1 These Regulations were adopted at a duly noticed public hearing (date).

8.3.2 These Regulations became effective upon approval by the Nevada State Board of Health.

APPENDIX 2

Qualitative Questionnaire

Housing

1. Can you explain why you called the Landlord-tenant hotline?
2. How do your housing conditions make you feel?
3. What prevents you from renting elsewhere?
4. What is your ideal renting experience?
5. What keeps you from achieving your ideal renting experience?

Landlord-Tenant Hotline

1. How has the landlord-tenant hotline been helpful in addressing your complaint?
2. How do you think the landlord-tenant hotline can be changed to address your needs?
3. Often the landlord-tenant hotline refers callers to legal services. Did you contact legal services?
 - 3.1. Did you find it helpful?
 - 3.2. Can you discuss the process?

Proposed Rental Housing Policy

The Southern Nevada Health District is proposing a rental housing policy which would establish guidelines for renters and landlords to maintain the home. It is based on guidelines that keep your home healthy like keeping it dry and pest free.

1. What do you think about a policy focused on keeping your home healthy?
2. If implemented what would be the benefits for you as a renter?
3. If implemented what would be the cons for you as a renter?
4. What should be a part of this policy that is important to you as a renter?

Housing & Health

1. Do you think the conditions of your rental affect your family's health? Explain.
 - 1.1. Do you think it has effected your health? Explain.
2. If you have health issues does it come into consideration where you rent?

Neighborhood Characteristics

1. What do you like most about your community?
2. What would you change about your community?
3. Are there factors that prevent you from walking or taking your kids to the playground?
 - 3.1. Is crime a concern?
4. Does this area have hospitals, quick cares or doctors' offices nearby if you need to see a doctor?
5. When you shop in the neighborhood what kind of food items are available to purchase?
6. What type of transportation do you use?

APPENDIX 3

Contact Summary Form

Case #: HIA QI 000

1. **What were the main issues or themes that struck you in this contact?**

2. **Summarize the information you got (or failed to get) on each of the target questions.**

<i>Housing Questions</i>
<i>Landlord-Tenant Hotline Questions</i>
<i>Proposed Rental Housing Policy Questions</i>
<i>Housing & Health Questions</i>
<i>Neighborhood Characteristics Questions</i>

3. **Anything else that struck you as salient, interesting, illuminating or important in this contact?**

4. **What new (or remaining) target questions do have in considering the next contact?**

APPENDIX 4

Policy Brief



Nevada rental housing is governed by the landlord-tenant chapter of the Nevada Revised Statute (NRS) § 118A which requires landlords to maintain "the dwelling unit in a habitable condition". However, when problems occur, renters must often navigate the judicial system to seek resolution. Rental Housing Policy was drafted in 2009 by the Southern Nevada Health District (SNHD) to address this gap and to address substandard rental housing in the county. The policy would provide the SNHD the authority to enforce (NRS) § 118A.

Continued... A local health agency like the SNHD can help renters who are not having any real options to fix their rental housing issues.

A Health Impact Assessment (HIA) was used to evaluate the potential health benefits and adverse health consequences of implementing the proposed policy. This HIA aimed to:

- Characterize housing complaints and asthma health
- Examine the effectiveness of correcting housing deficiencies
- Identify inequities & vulnerable populations that maybe disproportionately affected by RHP
- Make policy recommendations & design alternatives

Continued... The HIA also identified key policy options for Clark County renters.

The State of Housing in the U.S. & in Clark County, Nevada

- 3.8 million homes in the United States are in need of to address physical distress¹, with rental housing being at a significant share² thereof.
- 2% of all U.S. renters live in low-income rental housing, with plans to reduce physical distress, which includes water leaks that can lead to mold growth, and components that are in disrepair, peeling and chipping paint³.
- Clark County, Nevada has the highest residential heating bills in the country, with heating and cooling bills for a typical⁴ home.
- Of 2005 complaints into the National Tenant Hotline from 5/1/05-4/30/12, nearly 70% were from areas with high rates of rental distress.
- Of 10,000+ of complaints received from 2005-2012, 22% were associated with general mold/moisture, 20% concerned lead paint and 15% included carbon monoxide.

Asthma Health in Clark County, Nevada

- Respiratory health is the most prevalent condition related to housing conditions⁵.
- Exposure to dust mites, pet dander, cockroaches, allergens, mold, allergens, mold, radon and 6 other irritants are linked to the severe illness of an asthma attack⁶.
- 22.4% of Nevada children report having asthma, 11.8% of which are located in Clark County and over 3% have a current asthma diagnosis of which 62% live in Clark County⁷.

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