

**Healthy Housing in Colorado:
Integrating Health into the Housing Pre-Development Process**

Prepared for Housing Colorado

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Executive Summary

The purpose of this project is to facilitate better integration of health into the housing pre-development process by providing an educational resource for Housing Colorado members to learn promising practices for achieving this integration. In accomplishing its purpose, the study seeks to answer these key research questions:

1. What are the connections between health and housing?
2. How is health integrated into the housing pre-development process in Colorado and beyond?
3. What are the promising practices for integrating health into the housing pre-development process that can be applied to Colorado?

Through a thorough review of the literature, interviews with fourteen subject matter experts on the topic of housing and health, and a review of related documents, this project offers insights on these three questions. First, the connections between both physical and mental health and housing that can be addressed in the housing pre-development process are numerous, and occur at many levels including the housing unit itself, the development within which the housing unit sits, and the neighborhood where the development is located. Next, though integrating health into the housing pre-development stage is not yet standard practice in Colorado, it is being undertaken in some cases, is often driven by funding requirements, and a variety of opportunities and challenges exist. Finally, the promising practices for integrating health into the housing pre-development process that can be applied to Colorado include engaging partners, developing and documenting a shared vision and goals, and planning for sustainability.

Housing Colorado's unique role in supporting the affordable housing industry community with advocacy, education, and networking services, and its far-reaching membership base, puts the organization and its members in a prime position to improve the integration of health into the

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housing pre-development process in Colorado and beyond. To accomplish this, four specific recommendations -- engage health partners, program around healthy housing, leverage existing resources, and advocate for supportive policies -- are offered. Lastly, limitations of the study, as well as ways in which further research can address those limitations, are discussed.

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Introduction

Researchers have long hypothesized and demonstrated that health is impacted by factors, such as housing, outside the traditional health realm. In fact, as early as the 19th century -- when investigation showed that overcrowding and inadequate light and ventilation furthers the spread of communicable diseases and poses other environmental hazards such as fires -- experts began to promote healthy housing (Meltzer & Schwartz, 2015). Given that “we are (nearly) all exposed to housing conditions for more than two-thirds of our lives, any effect of housing conditions on health should have a large impact on population health” (Blakely, Baker, & Howden-Chapman, 2011, p. 598). Thus, understanding the connections between housing on health, and leveraging those connections, has the potential to yield significant positive health impacts.

Widely accepted theoretical models of health illustrate well the housing-health connection. These models posit that health is determined by a number of factors, which can be envisioned as layers building outward from an individual (Office of Disease Prevention and Health Promotion, 2015). Housing falls within the fourth of these layers, termed social determinants of health. The World Health Organization (WHO) describes social determinants of health as “the conditions in which people are born, grow, live, work and age” (WHO, 2015). Because the conditions in which people live are largely determined by their housing, both international and national organizations have recognized and highlighted the important linkages between housing and health.

On an international level, the WHO Knowledge Network on Urban Settings and the WHO Commission on the Social Determinants of Health prioritized the need for healthy housing and neighborhoods. On a national level, agencies overseeing both housing and health have expressed the importance of housing in determining health. The United States Department of

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Housing and Urban Development (HUD), for example, has addressed health in its programming since its establishment in the 1960s, and its strategic plan specifically cites linkages between housing and health in two of its five goals (HUD, 2010). Furthermore, HUD adopted the health in all policies paradigm, “which encourages policy makers to weigh the health implications of policies that are not normally considered health related” (Bostic, Thornton, Rudd, & Sternthal, 2012, p. 2130). The Affordable Care Act more recently enabled the alignment between health and housing at the federal level by establishing the National Prevention Council. Also within the health arena, the Centers for Disease Control and Prevention (CDC) echoed the importance of the housing-health link by highlighting improving housing and overall living conditions as a strategy to promote health (Thomson, Thomas, Sellstrom, & Petticrew, 2009).

As a natural extension of the emphasis on housing’s role in health at the international and national levels, the project client, Housing Colorado, wishes to facilitate better integration of health into housing at the state level. The purpose of this project is to enable this by delivering an educational resource for Housing Colorado members to learn promising practices for integrating health into the housing pre-development phase. To achieve this purpose, the remainder of this paper contains several sections, organized as follows: review of literature and statement of purpose, methodology, results, and discussion and conclusions. The review of literature and statement of purpose section describes the organization and its problem (which the project aims to address), reviews the scholarly literature on the topic, and states the purpose of the project and the research questions to be answered. The methodology section outlines the methods used to gather the information necessary to answer these research questions. Findings based on gathered information are reported in the results section. Finally, those results are interpreted and applied in the discussion and conclusions section.

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Review of Literature and Statement of Purpose

The organization and its problem

Housing Colorado is a 501(c)(3) nonprofit membership association representing the affordable housing industry in Colorado. Formed in 2005 as the result of the merger of three other closely aligned nonprofits, Housing Colorado has more than 250 organizational members from all sectors, encompassing 3,000 affordable housing professionals in the state (“About Housing Colorado”, n.d.). Members’ expertise spans construction, financing, human services, property management, and beyond. Advocacy, education and networking services are provided by Housing Colorado to their membership to achieve their mission of “the preservation and production of quality affordable housing for low and moderate income Coloradans...in order to build a strong economy and healthy communities” (“About Housing Colorado”, n.d.).

The linkage between housing and health has gained increased interest and attention in recent years nationwide, and also among the organizations and individuals Housing Colorado represents. Housing Colorado has met this interest with a variety of programs focused on the housing-health connection, particularly at their annual NOW! Conference, Housing Colorado’s signature event. At the 2013 NOW! Conference, a workshop session entitled “Colorado Healthy Homes: Next Steps to Success” was presented (Bednarek, Hanger, Hugill, & Prettyman). The 2014 NOW! Conference theme, “Creating Healthy Communities”, highlighted this area of interest, and offered a range of sessions focused on housing and health, most notably a general session entitled “Integrating Health into the Housing Community” (Agostino, A., Alexander, F., King, M. & Walvoord, L.).

Housing Colorado members have met these educational programs emphasizing the housing and health linkage with enthusiasm. The client has identified the completion and

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distribution of this project as an important next step in their efforts to provide valuable educational resources to complement and build upon these past successes. Housing Colorado indicated this study would be helpful as an informational tool for members to learn about the promising practices for integrating health into the housing pre-development process, and ultimately better achieve this integration in their own housing projects.

Scholarly literature

A review of the scholarly literature offers several important findings that help fulfill this intended project purpose. First, housing at both the unit and neighborhood levels has documented impacts on mental and physical health. Next, affordability plays a key role in the health impacts of housing, and extends to influence housing-driven health inequities among vulnerable groups. In response, researchers advocate a proactive, multidisciplinary approach to incorporating health into housing; the pre-development stage is crucial to achieving this. The most widely researched tool for integrating health into the housing pre-development process is the Health Impact Assessment (HIA). The paragraphs below expand upon this summary of reviewed literature.

Various researchers over time have thoroughly documented housing's impacts on health. Housing, it is important to note, extends far beyond the "house" in the strict sense of the word. Housing includes not only physical dwelling units themselves, but also the areas surrounding them, such as buildings, blocks, neighborhoods, and beyond (Meltzer & Schwartz, 2015; Catalano & Kessell, 2003). These two distinct scales: the housing unit itself and the neighborhood where it is located, offer a useful framework for presenting housing's impacts on health. At the unit level, unsafe living conditions include exposure to lead paint, moisture and mold, cockroach infestations, defective furnaces and other equipment, extreme heat and cold, crowding, noise, deficient light, and poorly maintained housing. These substandard environments

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can cause neurological and developmental problems for children, respiratory and immunological issues, asthma, poisoning by gases, pulmonary problems, depression, insomnia, mood disorders, and risk of falls and fires (Meltzer & Schwartz, 2015; Lubell, Morley, Ashe, & Merola, 2011).

In addition to the impact of housing units, what surrounds the unit -- its location relative to goods and services, as well as access to transportation and recreation opportunities -- also affects health. Research shows that residents are more likely to walk or bike in neighborhoods with easy access to stores and basic services, as well as parks and other leisure areas (Lubell et al., 2011). Srinivansan, O'Fallon, & Dearry (2003) claim that where these transportation and recreation options do not exist, a lack of activity contributes to isolated and sedentary lifestyles. Through diminished social networks and social capital, these lifestyles can be linked to a number of health problems such as increased rates of mortality, mental health issues, obesity, and cardiovascular disease. The degree to which healthy foods are easily obtained by neighborhood residents -- or not -- also has significant impacts on health (Lubell et al., 2011). Lower-quality housing, which is often distressed by higher rates of crime and poverty, has been linked to mental health and medical problems such as depression and hypertension (Meltzer & Schwartz, 2015).

These health impacts, resulting from both housing units themselves and the areas surrounding them, have important connections to affordability. These connections are of particular interest in this study, given that Housing Colorado is the association for Colorado's *affordable* housing industry. Before discussing the role of housing affordability in health, it is critical to establish a definition of the concept. Unaffordable housing is "commonly defined as spending more than 30% of household income on housing expenses" (Pollack, Griffin, & Lynch, 2010, p. 515).

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When households spend above this threshold on housing expenses, they have fewer funds available for essential living expenses such as food and health care. This leads some to delay important doctor's visits, forgo or take lesser doses of prescribed medications, and purchase cheaper but less nutritionally valuable foods (Pollack et al., 2010). Meltzer and Schwartz (2014) found this trend to be "particularly strong for those households with severe rent burdens" (p. 1). Additionally, high housing costs can promote crowding and instability -- defined as vulnerability to foreclosure, frequent moves, and even eviction -- and drive increased spread of viruses and heightened risk factors for depression, stress, and other mental health issues (Lubell et al., 2011). Further compounding issues of affordability is the fact that "lower-income and minority populations pay higher percentages of their annual income in energy and transportation costs" (Foy, 2012, p. 1), both of which are affected heavily by characteristics of both housing units themselves and the neighborhoods where they are located.

The role of housing affordability in influencing health has significant implications for health inequities along socioeconomic, racial, and other dimensions. On the housing unit level, research has shown that low quality housing is commonly inhabited by the sick, elderly, and unemployed. Furthermore, these residents often suffer greater exposure to the environmental hazards associated with poor living conditions, because they tend to spend more time indoors (Thomson, Thomas, Sellstrom, & Petticrew, 2009). Krieger and Higgins (2002) found that families of color and low-income families are more likely to occupy homes with physical problems, and that overcrowding, injuries, and extreme heat and cold are more frequent in low-income households. In addition, children from minority and low-income families are disproportionately affected by the serious ailments commonly associated with substandard housing (Bashir, 2002).

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Health inequities amongst vulnerable populations also result from differences in neighborhood environments. Srinivasan et al. (2003) examined an array of studies and revealed that minority and low-income residents overall are less likely to have access to neighborhoods that offer recreational opportunities and nutritional food options. A deteriorated physical environment has also been shown to be associated with crime, which can lead to an eroded sense of safety and heightened isolation. Foy (2012) reports research also demonstrates the “disproportionate effects that low-wealth households experience from environmental degradation, including air, water, and noise pollution” (p. 1).

In response to housing’s clear impacts on health, and the related connections to affordability and health inequities, researchers have identified several strategies to leverage the housing-health connection for improved health outcomes. Indeed, Howden-Chapman (2002) emphasizes this is an effective tool: “Focusing on housing and neighbourhood improvements have historically been key policy instruments to improve population health” (p. 645). From a research perspective, experts identify translational research -- which takes findings from the academic realm and applies them to the practical one -- as particularly crucial in advancing health in housing (Srinivasan et al., 2003; Jacobs, Kelly, & Sobolewski, 2007). This project is an example of translational research, and aims to present findings that are useful not only for an academic audience, but also for practitioners. In addition to translational research, researchers also promote an ecological approach to improving health through housing, which takes into account the many environmental factors, including housing, that affect health (Saegert, Klitzman, Freudenberg, Cooperman-Mroczek, & Nassar, 2003). Key to this ecological concept, experts say, is a proactive, multidisciplinary approach (Jacobs et al.; Krieger & Higgins, 2002).

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The housing pre-development phase offers an unparalleled opportunity for integrating health into the housing process just as the research suggests: in an ecological, forward-looking, and collaborative manner. Before expounding upon these opportunities, it is important to provide clarity around the housing development process, and pre-development phase specifically.

Broadly speaking, the housing development process has three phases: the feasibility phase, the pre-development phase, and the construction phase. The pre-development phase is the stage of the housing development process wherein financial partners are secured, structures are designed, necessary approvals are obtained, and the construction team is procured to move the project into the next phase (Canada Mortgage and Housing Corporation, 2016). Because all project parties are determined, yet housing design details are not yet defined at this stage, the pre-development phase provides an ideal setting for integrating health into the housing process.

The most widely researched tool for integrating health into the housing pre-development process on the national level is the Health Impact Assessment (HIA). HIA draws on a wide range of disciplines and has broad utility, but has specifically been recommended and assessed for housing projects (Thomson, Petticrew, & Douglas, 2003). According to the Centers for Disease Control and Prevention (CDC), “HIA is a process that helps evaluate the potential health effects of a plan, project or policy before it is built or implemented” (CDC, 2015). Generally speaking, public health departments and educational institutions have conducted the majority of the HIAs in the United States. The sizes of projects assessed using the HIA tool have historically been relatively small, but have recently trended toward larger scales, and their recommendations are used at various governmental levels (Dannenberg, Bhatia, & Cole, 2008). The prevalence of HIA is also increasing: according to Ross et al. (2014), there were only 27 completed HIAs in the U.S. in 2007; in 2014 that number rose to 225. This rise is attributed to increased awareness and

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recognition by cities and states that HIA is a useful tool for considering health (Ross et al., 2014). According to the Health Impact Project led by the Pew Charitable Trusts and Robert Wood Johnson Foundation, seven HIAs have been completed, and one more is in progress, in Colorado (Pew Charitable Trusts, 2015).

Along with increased interest in, and application of, Health Impact Assessments nationwide, a variety of interpretations and applications have emerged. However, several key features and an established methodology remain generally consistent. Ross et al. (2014) found the three main features of HIA are as follows: HIA informs decision-making, the process for HIA is flexible yet structured, and HIAs assess a comprehensive range of health impacts (2014). Seven major steps comprise the HIA process: screening, scoping, identification, assessment, decision-making and recommendations, and evaluation and follow-up (Harris, Harris-Roxas, Wise, & Harris, 2010). Depending on available time and resources, three major HIA typologies have developed: rapid, intermediate, and comprehensive. HIAs also vary based on the degree to which they are isolated, or integrated into other assessments and processes (Ross et al., 2014).

Regardless of the particular form an HIA takes, scholarly literature demonstrates the value of the process, and makes suggestions for improving the utility of HIA. Health Impact Assessments add value by promoting evidence-based decision making, improving equity for vulnerable populations, and facilitating multi-sector and multi-disciplinary collaboration to achieve improved health outcomes (Harris et al, 2010). Though the research does not aptly identify promising practices for applying HIA in the housing context specifically, it does offer several broad recommendations for maximizing the usefulness of HIA. These include increasing the use of data and research at each stage of the HIA process, taking local conditions into account when conducting an HIA, beginning the HIA process early in the consideration of a

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given plan, project, or policy, and developing and maintaining strong collaborative relationships throughout (Harris et al., 2013; Thomson et al., 2003). These recommendations directly inform the project purpose.

Purpose and research questions

The purpose of this project is to produce a resource Housing Colorado members can use to learn about the promising practices for integrating health into the housing pre-development process, and ultimately better achieve this integration in their own housing projects. The project will describe the connections between housing and health, the current state of practice with regard to integrating health into the housing pre-development process, and promising practices for doing so in the future. This educational tool will build upon past, well-received programming efforts by the organization to highlight the important connections between housing and health.

To fulfill this purpose, the study aims to answer the following main research questions:

1. What are the connections between health and housing?
2. How is health integrated into the housing pre-development process in Colorado and beyond?
3. What are the promising practices for integrating health into the housing pre-development process that can be applied to Colorado?

Methodology

A qualitative design involving interviews and document review was undertaken for this study. Fourteen Colorado subject matter experts on integrating health into the housing pre-development process were interviewed by the evaluator. Several potential interview subjects were initially suggested by the client; additional interviewees were identified through the evaluator's review of practitioner literature and by other interviewees. The sixteen interview questions and associated probes were developed by the evaluator simultaneously with the literature review process with the intent to use the interview data to fill the gaps observed in the

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literature and answer the research questions. In addition, the evaluator asked follow-up and probing questions of the interviewees as needed to clarify responses.

The interviews were semi-structured. This research design is appropriate “when the researcher wants to gain in-depth understanding of complex issues, experiences, processes, or interpretations” (Johnson, 2010, p. 86). Interviews were conducted via phone call for convenience of scheduling and logistics. Each interview lasted between 30 and 60 minutes depending on the interviewee’s availability and the pace of the interview itself. The evaluator transcribed each of the interviews, which were then analyzed to identify patterns and themes that informed the study findings (Miles, Huberman, & Saldana, 2013).

In addition to subject matter expert interviews, relevant practitioner literature was identified through the literature review and interview processes and analyzed as supplementary data. As Turner points out, “Often times interviews are coupled with other forms of data collection in order to provide the researcher with a well-rounded collection of information for analyses” (Turner, 2010, p. 754). As with the interviews, these documents were carefully reviewed to draw out patterns that helped shape the findings of this study. The findings from both the interview and document sources have been compiled into the following section, which presents the study results. A complete list of interviewees can be found in Appendix 1. For the instrument used to conduct the interviews, see Appendix 3.

Results

Based on themes identified in the data gathered from both subject matter experts interviewed and documents reviewed, the following results were found. They are presented in response to each of the three key research questions this project is intended to address.

What are the connections between health and housing?

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“You put health and housing together, and you get healthier people” (L. Konsella, personal communication, March 30, 2016).

The interviews conducted and documents reviewed confirm and extend the findings from the literature indicating that there are significant and documented connections between housing and health. These connections occur at both the unit and neighborhood levels, and affect not only physical, but also mental, health. At the unit level, neurological and developmental problems for children, respiratory and immunological issues, asthma, poisoning by gases, pulmonary problems, depression, insomnia, mood disorders, and risk of falls and fires can arise from unsafe living conditions including exposure to lead paint, moisture and mold, cockroach infestations, defective furnaces and other equipment, extreme heat and cold, crowding, noise, deficient light, and poorly maintained housing. (Meltzer & Schwartz, 2015; Lubell, Morley, Ashe, & Merola, 2011). On the neighborhood level, mental health and medical problems such as depression, increased rates of mortality, hypertension, cardiovascular disease, and obesity can be linked to lack of access to parks and leisure areas, stores, and basic services via active transportation options such as biking, walking, and transit, which can also be compounded by isolated and sedentary lifestyles, as well as crime and poverty (Lubell et al., 2011; Srinivansan et al., 2003).

Subject matter experts consistently agreed that the implications of integrating health into the housing pre-development process are numerous and significant. While those particular implications varied depending on the given interviewee’s particular area of focus, the general theme was improved health for individuals, families, and communities. Positive implications heavily outweighed negative ones, and the only negative implication -- which was mentioned almost universally -- was a potential increase in the cost of developing housing. Several interviewees noted the tradeoff that this entails: for the cost of achieving a healthy development,

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could one or two additional units have been constructed, potentially housing more residents in need? Furthermore, financing affordable housing development is a complex endeavor, often involving multiple funding sources with associated constraints, and some subject matter experts worried it would be difficult to justify costs of integrating health considering valuable and limited funding. Nevertheless, interviewees concurred that benefits of integrating health into the housing pre-development process far outweigh costs on a long-term, community-wide basis.

Interview subjects solidly considered pre-development to be a unique and opportune stage in the housing process with respect to the integration of health. Generally speaking, because the pre-development phase happens early in the project process, it offers the most opportunity, flexibility, and cost-effectiveness for the integration of health. In addition, it allows a space for project and community partners to be identified and convened, and a vision and goals emphasizing health to be established and committed to. Specifically, the ability to site a project in an area conducive to healthy lifestyles was mentioned by interviewees, as were the opportunities to plan for health-supportive uses such as clinics and case management services, design interior and exterior features -- for example, stairways and trail systems -- to encourage healthy behaviors, and select health-supportive materials like lead-free paints and no- or low-Volatile Organic Compound (VOC) carpets.

How is health integrated into the housing pre-development process in Colorado and beyond?

“If you say your goal is to help people be well, you start thinking about design totally differently -- it’s a whole series of decisions you would make that involve making people be healthy. It is absolutely a paradigm shift.” (C. Smith, personal communication, March 25, 2016).

Though there is certainly momentum behind better integrating health into housing, interviewees reported that this is not yet standard practice in Colorado housing development. For the most part, the status quo supports *protecting* health -- for example, building and fire codes

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that ensure housing is structurally sound, and adequate in the case of an emergency -- rather than *promoting* health through more holistic, proactive measures. The extent to which the promotion of health is integrated into housing is largely dependent upon the funding streams involved. Certain funders -- such as the Colorado Department of Local Affairs, and Low-Income Housing Tax Credits administered through the Colorado Housing and Finance Authority -- give strong preference to projects that follow certain health-conscious standards. The Enterprise Green Communities criteria -- which outline a checklist of features of affordable green housing projects -- are one example of standards related to health that funders look for when assessing projects.

Apart from requirements linked to funding sources, several other approaches -- some voluntary and some regulatory -- to integrating health into the housing pre-development stage emerged during the interviews. One of these is a referral process, in which plans for new housing developments can be referred by the project team to the local health department for their review and input from a public health perspective. Another tool for integrating health is zoning codes, which regulate land uses relative to one another. This is especially relevant in siting projects in health-supportive locations. Language establishing criteria for the built environment can also be included in adopted plans, encouraging or requiring developers to meet certain health standards in their projects. Conducting a health impact assessment, or community health needs assessment, is yet another technique for examining the health impacts of a certain housing project, program, or policy in a highly structured, organized manner. In addition to emerging in the interview data, this finding is also heavily supported by the scholarly literature. A more informal strategy for integrating health is simply holding charrettes as part of the pre-design process, wherein both the owner and design teams collaborate to identify ways that a housing project's design features can be conducive to healthy environments and lifestyles.

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The application of any of these approaches to better integrate health into the housing pre-development process would certainly represent progress, but the most compelling opportunity interviewees identified is policy change. Specifically, interviewees advocated strengthening policies at the local level to require, rather than simply encourage, developers to integrate health into their housing projects through codes and ordinances. This would not only raise awareness about a community's dedication to healthy housing, but also help overcome what interviewees perceive as the biggest challenge to integrating health into the housing pre-development process: lack of regulatory requirements. Even more than other identified challenges to achieving this integration -- such as potential increased costs and the existing complexity of affordable housing financing, difficulty demonstrating direct linkages between housing improvements and health and the return on investment of healthy housing, the "not in my backyard" (NIMBY) mentality and stigma surrounding affordable housing, and the difficulty of instigating cultural changes to embrace health in housing -- the lack of regulation presents a substantial obstacle.

As compared to other states, interviewees see Colorado as being not necessarily on the cutting edge of progress insofar as integrating health into the housing pre-development process, but certainly in the group of leading states. One unique characteristic of Colorado that some interviewees reported may influence the integration of health into the housing pre-development process is local control, which gives cities and towns greater regulatory autonomy.

Interviewees reacted with mixed responses to questions about the impact of housing cost (affordable or market-rate) and the housing market on the integration of health into the housing pre-development process. With respect to housing cost, some interviewees perceived that health could be more easily integrated into the pre-development process for market-rate housing, due to demand for and marketability of health-centered amenities and the ability to pass increased costs

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along in the form of higher rents. Others saw that affordable housing had a potential advantage in this arena due to requirements attached to affordable housing funding, the participation of more mission- rather than profit-driven developers, and a sense of responsibility to mitigate existing health inequities that often affect residents of affordable housing. In addition, affordable housing is more typically rented than owned, potentially introducing disparities in the ability and right to expect and demand healthy housing between renters of affordable housing versus owners of market-rate housing.

Interviewees agreed that the current tight housing market across Colorado could present unique challenges for the integration of health into the housing pre-development stage. With demand for housing -- and especially affordable units -- far outpacing supply, developing housing quickly to meet the growing need may not consider or prioritize health. In addition, interviewees reported construction costs have risen and continue to rise, and that contractors -- especially those that are specialized -- are busy in the booming development economy, making it difficult to secure them for large and long-term projects. Finally, the tight market has affected housing affordability for a broader segment of the state than before, elevating awareness of the need for affordable housing and creating an opportunity for dialogue and action.

What are the promising practices for integrating health into the housing pre-development process that can be applied to Colorado?

“I would say, the biggest key and one of the things I am trying to emphasize, it is possible to build these types of buildings with these types of features that provide housing that is quality for people that normally do not receive this type of housing. We can do it, and you can too.” (B. Windsor, personal communication, March 16, 2016).

Three key promising practices for integrating health into the housing pre-development process emerged from the interviews conducted, documents reviewed, and scholarly literature examined in this study. First, engage partners. Second, develop and document a shared vision

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and goals. Finally, plan for sustainability. Each of these three promising practices is discussed in greater detail below.

Interviewees repeatedly mentioned, and the documents reviewed reinforced, the importance of identifying and engaging partners throughout the housing process for effective integration of health into the housing pre-development stage. These partners should include not only the development and ownership team, but also neighbors in the area where the project will be located, future residents of the housing, tenants of any office or commercial space (for example, a health clinic) incorporated in the project, health experts, and those who will construct, operate, maintain, and otherwise spend time in and around (for example, on-site case managers) the housing development. This provides an opportunity to view the project from a range of stakeholder perspectives, ameliorate any associated stigma and facilitate community cohesion, and learn directly from future residents about their housing needs and wants relative to health. Furthermore, partnerships can cultivate project champions, provide avenues for educating about and gaining buy-in for the importance of health in housing, bring necessary data and insights from a range of disciplines to the discussion, and leverage existing resources accessible by various partners. Partners' roles should be made clear to emphasize accountability and maximize the value of established partnerships.

Once partners have been identified and are engaged in their roles, interviewees reiterated the need to develop and document a shared vision and goals. By thinking intentionally about what the project is meant to achieve, partners can set expectations, prioritize efforts, and negotiate compromises early on in the project process. Interviewees underscored the importance of thinking in big-picture, long-range, and holistic terms when creating the vision, and complementing that with detailed, short- and mid-term, and specific goals to spur and monitor

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action. Documenting the vision and goals is important for accountability reasons, but also to communicate to external partners what is most important in the project. For local communities and housing authorities, these documents can be used to set expectations, standards, and criteria in plans and other documents to guide future housing development. These can even be reinforced further through the development of a combination of regulations and incentives -- the preferred approach for many interviewees -- to accomplish better integration of health into the housing pre-development process.

Finally, to maximize the value and impact of integrating health into the housing pre-development phase, interviewees urge fellow practitioners to plan for sustainability. This can take the form of budgeting to operate and maintain the healthy aspects of a housing development, ensuring the appropriate staffing needs will be met long-term, or coordinating any hand-offs from one team to another between stages in a project. In addition, subject matter experts emphasize that resources should be dedicated to evaluating and assessing project outcomes relative to goals, and to continuously applying and integrating feedback to sustain and improve the project's positive health impacts. Furthermore, interviewees noted the importance of highlighting successes and demonstrating benefits, not only to recognize and celebrate current achievements, but to build momentum for future efforts, with the ultimate goal of transforming the integration of health into the housing pre-development stage from the exception to the standard practice.

Discussion and Conclusions

In summary, the research results offer insights on the three main questions posed in the study. First, the connections between both physical and mental health and housing that can be addressed in the housing pre-development process are numerous, and occur at many levels

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including the housing unit itself, the housing development overall, and the neighborhood where it is located. Next, though integrating health into the housing pre-development stage is not yet standard practice in Colorado, it is being undertaken in some cases, is often driven by funding requirements, and a variety of opportunities and challenges exist. Finally, the promising practices for integrating health into the housing pre-development process that can be applied to Colorado include engaging partners, developing and documenting a shared vision and goals, and planning for sustainability.

These findings have several implications for Housing Colorado. First, the strong housing-health connection validates and underscores the importance of Housing Colorado's recognition of, and involvement in, this meaningful subject. As awareness of the topic rises within the affordable housing community -- which it is expected to do -- this importance will only grow. Furthermore, though there is momentum behind transforming the integration of health into the housing pre-development stage from the exception to the standard practice, there is ample opportunity for improvement in this arena. The promising practices associated with these opportunities have direct linkages to Housing Colorado's mission and main areas of emphasis: advocacy, education, and networking. Thus, through its unique role in supporting the affordable housing industry community and far-reaching membership base, Housing Colorado and its members can play a unique and crucial role in improving the integration of health into the housing pre-development process in Colorado and beyond. To accomplish this, four specific recommendations -- engage health partners, program around healthy housing, leverage existing resources, and advocate for supportive policies -- are offered below.

Engage health partners

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One of the major challenges to, and opportunities for, better integrating health into the housing pre-development process identified through this study is the connection between health and housing experts. Because of Housing Colorado's convening and leading role in the state's affordable housing industry, it could facilitate great strides in this arena by engaging health partners. This could be done through recruitment of health-focused members, linkages with similar membership-based or other organizations in the health realm, and programming efforts with an emphasis on bringing housing and health experts and knowledge together.

Program around healthy housing

Building upon past successful programming around healthy housing could serve the dual purpose of linking housing and health experts together through networking events as discussed above, and educating Housing Colorado members on the important connections between health and housing. This would address another key challenge -- a lack of awareness about the importance of housing in health -- illuminated through the research. A webinar, forum, or session at the annual Housing Colorado NOW! Conference could serve as an ideal venue for a program or series of programs featuring health in housing.

Leverage existing momentum

A common theme heard in the interviews conducted, and confirmed in the documents reviewed, is that a wealth of research and publications on the housing-health connection, and integrating health into the housing pre-development process specifically, already exist. Several of these appear in the references section of this project, as well as Appendix 2, Documents. In addition, individual experts and groups of experts such as the Colorado Healthy Homes Coalition and others are eager to share their knowledge and experience on this important topic more

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broadly with other interested practitioners. Leveraging this existing momentum in the engagement of health partners, and programming around healthy housing, could be a highly effective strategy.

Advocate for supportive policies

Policy changes supporting the integration of health into the housing-pre-development process were commonly cited by interviewees as one of the most important things Colorado can do to improve the integration of health into the housing pre-development process, and Housing Colorado is uniquely poised to contribute to this through their role in advocacy. These desired policy changes are generally grouped into two broad categories: 1) additional resources, and 2) requirements for integrating health into the housing pre-development process. These align well with two of Housing Colorado's 2016 policy priorities, "support policies that promote increasing funding and financing tools that encourage the development of affordable housing within Colorado" and "support policies that reduce barriers and facilitate quality affordable housing development and construction", respectively ("Policy Priorities: 2016 Board Policy Priorities", 2016).

Limitations and future research

Though the researcher is confident in these conclusions, the study does have limitations -- including sampling and potential bias -- that must be noted, and can be alleviated by future research. First, the relatively small interview sample size ($n = 14$) compromises the ability of the results to be generalized to the larger population of healthy housing practitioners in Colorado, as does the purposive rather than random nature of the sampling approach (Johnson, 2010). This limitation could be addressed through further research -- conducted by the client or other

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researchers -- involving additional interview subjects. Furthermore, semi-structured interviews allow ample opportunity for general and confirmation bias by researchers, both in the data collection and analysis stages (Johnson, 2010). This potential may have been stronger in this study because one researcher, unchecked by other researchers, conducted and analyzed all of the interviews. The researcher attempted to alleviate the concern of bias through modifying the interview instrument to be more neutral and less leading, and conducting sporadic member checks to clarify accurate understandings and interpretations during the interview process. Further research could involve more than one researcher to lessen the concern of bias.

Despite these limitations, the project was successful in answering the key identified research questions, and fulfilling its intended purpose of providing an educational resource for Housing Colorado members to learn promising practices for achieving integration of health into the housing pre-development process. By learning these practices, it is hoped members will be educated and empowered to accomplish this effectively in their own housing development projects. Housing and health is an area worthy of additional research, which can build upon both the strengths and weaknesses of this study.

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Appendix 1: Interviewees

1. Gretchen Armijo, Built Environment Administrator, City and County of Denver - Department of Environmental Health
2. Kim Bartels, Children's Environmental Health Coordinator, U.S. Environmental Protection Agency - Region VIII
3. Jill Bednarek, Organizer, Colorado Healthy Homes Coalition; Secondhand Smoke Coordinator, Colorado Department of Public Health and the Environment
4. Krista Egger, Senior Program Director - Green Communities Initiative, Enterprise Community Partners
5. Julie George, Campaign Director, HEAL Cities and Towns Campaign
6. Rick Hanger, Program Manager - Housing Technology and Standards Section, Colorado Department of Local Affairs
7. Abby Hugill, Healthy Homes Representative, U.S. Department of Housing and Urban Development - Office of Lead Hazard Control and Healthy Homes
8. Laurie Konsella, Acting Regional Health Administrator, Department of Health and Human Services - Assistant Secretary for Health - Region VIII
9. Michael Leccese, Executive Director, Urban Land Institute - Colorado
10. Sheila Lynch, Land Use Program Coordinator - Environmental Health Division, Tri-County Health Department
11. Chris Smith, Senior Program Officer - Healthy Living, Colorado Health Foundation
12. Becky Smith, City Planner, City of Northglenn
13. Ryan Tobin, Director of Real Estate Development, Denver Housing Authority
14. Bill Windsor, Vice President of Housing Development, Colorado Coalition for the Homeless

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Appendix 2: Documents

1. Denver Housing Authority (2011). Use of the Healthy Development Measurement Tool (HDMT) in Denver: Cross-Sector Partnerships for Development and Public Health. Retrieved from <http://www.denverhousing.org/development/Mariposa/Documents/Healthy%20Development%20Measurement%20Tool%20Report.pdf>
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Appendix 3: Interview Instrument

1. Tell me about your background in housing and health. Tell me your perception and experience of the connection (or lack of connection) between housing and health.

Probe: What are your interests, experiences, and professional role(s) as related to these topic areas?

2. Tell me about your organization: what is its mission, and how (if at all) does it relate to housing and health?

Key question 1: what are the connections between health and housing?

3. Are there implications of integrating health (or not integrating health) into the housing pre-development process? If so, what are they?

Probe: What impacts, positive and negative, can arise?

4. Is the pre-development stage of the housing process unique (or not unique) from other stages in the housing process with respect to the integration of health?

Probe: Are there opportunities and challenges specific to this stage? If so, what are they?

Key question 2: how is health integrated into the housing pre-development process in Colorado and beyond?

5. To what extent, and how, is health typically integrated into the housing pre-development process? Does this vary (or not vary) between Colorado and elsewhere? If it does vary, how so?

Probe: What are the involved stakeholders, processes, resources, etc.?

6. What are some of the opportunities for integrating health into the housing pre-development process? Do these vary (or not vary) between Colorado and elsewhere? If the opportunities do vary, how so?

Probe: How do the involved stakeholders, processes, resources, etc. present (or not present) opportunities?

7. What are some of the challenges of integrating health into the housing pre-development process? Do these vary (or not vary) between Colorado and elsewhere? If the challenges do vary, how so?

Probe: How do the involved stakeholders, processes, resources, etc. present (or not present) challenges?

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8. Does housing cost affect (or not affect) if and how health is integrated into the housing pre-development process? If so, how, and if not, how not?

Probe: Are there differences in how health is integrated into the housing pre-development process for affordable and market-rate housing? If there are differences, what are they?

9. Do current market conditions affect (or not affect) if and how health is integrated into the housing pre-development process? If so, how, and if not, how not?

Probe: The housing market in Colorado -- Denver specifically -- is soaring. To what extent and how (if at all) does this impact the integration of health into the housing pre-development process?

Key question 3: what are the promising practices for integrating health into the housing pre-development process that can be applied to Colorado?

10. From your experience, what are the common characteristics of successful efforts to integrate health into the housing pre-development process? What are the common characteristics of unsuccessful efforts?

11. What would you say are the promising practices for integrating health into the housing pre-development process? Are these practices replicable?

12. Overall, what advice would you give other practitioners trying to integrate health into the housing pre-development process?

13. Compared to other states in the nation, how well is Colorado doing with respect to integrating health into the housing pre-development process?

Probe: Is Colorado doing better, worse, or about the same, and in what sense(s)?

14. What can Colorado do to improve the integration of health into the housing pre-development process?

Probe: What tools, policies, resources, etc. would be important?

15. Is there anything further you'd like to share with me on this topic?

16. Are there other subject matter experts on this topic with whom you'd suggest I speak?

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Appendix 4: Core Competencies Supplemental Documentation

The three areas of course competencies most relied upon as part of this project are identified below, along with descriptions of how these competencies, as well as knowledge and skills gained from MPA courses, help inform the completed project.

To participate in and contribute to the policy process

The purpose of the project – to provide the client an educational resource for its members to learn promising practices for integrating health into the housing pre-development process, and ultimately better achieve this integration in their own housing projects – involves participation in and contribution to the policy process on the part of both the researcher and the client’s members. By delivering relevant findings from scholarly literature and also from original interview research, and offering recommendations based on these findings, the researcher is enabling the client’s members to knowledgeably participate in the policy process relative to the integration of health into housing. Also, through providing a solid academic knowledge base on the topic while connecting practitioner perspectives through the interview process, the project aims to bridge gaps that will assist in overcoming obstacles to successful policy implementation to achieve effective integration of health into the housing pre-development process. Thus, not only has the student engaged in the policy process by developing this resource, but also enabled its client’s members and other audiences to engage as well. Specifically, knowledge and skills from PUAD 5005, Policy Process and Democracy, and PUAD 5631, Environmental Politics and Policy, were employed in the conduct of the project.

To analyze, synthesize, think critically, solve problems and make decisions

This project has relied heavily on the elements encompassed within this competency. Decision making by applying appropriate criteria and processes played a significant role in the

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definition of the project scope, selection of relevant literature, shaping of appropriate methodology, and at various points throughout the process of developing recommendations and communicating findings. Problem solving was an ongoing theme throughout the course of the project, as new challenges arose throughout the progression of the project process. Both making decisions and solving problems required analysis, synthesis, and critical thinking. These skills were also essential in the literature review process, in which relevant existing research was first analyzed and then synthesized to provide a solid grounding and framing for the original research carried out as part of this project. In conducting and gleaning meaningful findings from the interviews with experts on the subject matter, the tools of analyzing responses, synthesizing themes, and critical thinking to develop findings were also paramount. Finally, offering recommendations and reaching a project conclusion required the application of various perspectives and assumptions, as well as a synthesis of the relevant findings from and implications of the project overall. While knowledge and skills from all MPA core courses were employed in the conduct of the project, PUAD 5003 Research and Analytical Methods played an especially central role.

To communicate and interact productively with a diverse and changing workforce and citizenry

For this final project to be truly effective in achieving the student and clients' shared goals, it is expected and hoped to be read and referenced by the client's membership. This group reflects very well the "diverse and changing workforce and citizenry" identified in the competency language itself. Accordingly, this competency played a crucial role throughout the project process. First, a client-based project such as this requires working with others -- the client themselves, who represents a broad membership base, as well as other Capstone committee members -- to accomplish the ultimate goal of delivering a successful Capstone project. Second,

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a range of diverse subject matter experts were communicated and interacted with through the interview process as part of the original research component of this project, in order to ensure the inclusion of and consideration for various backgrounds and viewpoints. Next, the feedback offered on the project by the client and their Editorial Committee, which advises on Housing Colorado communications, represents the needs and desires of their membership, consisting of a variety of industry experts. Considering and integrating this feedback into the project to the extent possible recognizes the value of stakeholder participation and also ensures that the final product is communicated in a way that is accessible and useful to a variety of audiences. Specifically, knowledge and skills from PUAD 5001, Introduction to Public Administration, PUAD 5002 Organizational Management and Behavior, and PUAD 5110 Seminar in Nonprofit Management, were employed in the conduct of the project.