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Housing for care, connection, and health equity

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ABSTRACT

Researchers and policymakers have used a four-pillar framework— condition, consistency, context, and cost—to describe the characteristics of housing that are important for health equity. We propose adding a fifth pillar: care and connection. Housing for care and connection refers to the housing design, institutional policies, and housing programs that strengthen social connections, caregiving relationships, access to resources, and a sense of self in community. Attending to these needs in housing is especially important for people who are in transition in and out of homelessness, living in poverty, are very young or very old, or living with a disability or activity limitation.

1. Introduction

Housing is a key determinant of health equity, which is characterized by both the opportunity for healthy living and a process by which individuals determine what health means for them (Braveman et al., 2017; World Health Organization, n.d.). A common conceptual framework identifies four pillars of housing that support health and health equity: housing *condition* and quality; *consistency* or residential stability; *cost* or affordability; and neighborhood *context* (Aiken, 2023; Green et al., 2021; Swope and Hernández, 2019; L. A. Taylor, 2018). To leverage the benefits of housing for health equity, we must extend the current housing-to-health framework beyond the most tangible aspects of housing. A relational view of place prioritizes the interactions between people as a primary mechanism for health promotion (Corburn, 2013; Cummins et al., 2007; Jennings and Bamkole, 2019). Housing is the primary site for caregiving—and thus, housing that limits the ability of people to give and receive care limits opportunities for health and produces health inequities (Hirt, 2016). In this paper, we call for a fifth pillar of housing for health equity - *care and connection* - describing how housing facilitates or inhibits caring relationships and social connections and, through that, health (Fig. 1).

We begin with a description of the current four-pillar model of housing and health equity before articulating why scholars and policy makers should elevate care and connection as a new pillar of healthy housing. We next describe the conceptual foundations of the care and connection pillar and present our conceptualization of how housing design, policy, and programming can promote care and connection and ultimately impact health outcomes. We then illustrate our proposed pillar with two examples: permanent supportive housing for people exiting homelessness and housing for aging in place. In the discussion, we discuss critiques and limitations of our five-pillar model and conclude by recommending policy changes in a US context to strengthen the health equity benefits of housing for care and connection.

To locate relevant research evidence to inform the elements specified in the model as aspects of housing design, policy, and programming (Fig. 2), we conducted and synthesized findings from a non-systematic search for systematic reviews, quantitative, and qualitative studies on the link between care and connection and health. Our search included research from a range of disciplines, such as public health, urban planning, medicine, and geography. Though limited to studies published in English, we included research from a range of global regions and countries. However, most of the research we cite, particularly in the two examples, was conducted in the US or Canada.

1.1. Housing and health equity: the four-pillar model

The current conceptual model linking housing and health equity, promoted by the Robert Wood Johnson Foundation, the American Public Health Association, and others, contains four components (Hilovsky et al., 2020; Robert Wood Johnson Foundation, 2019; L.A. Taylor, 2018). Swope and Hernández (2019) call these the four pillars of healthy housing: conditions, consistency, context, and cost (hereafter, the “four C model”). To summarize, there is strong evidence that *housing quality and conditions*, such as indoor air quality, temperature, thermal

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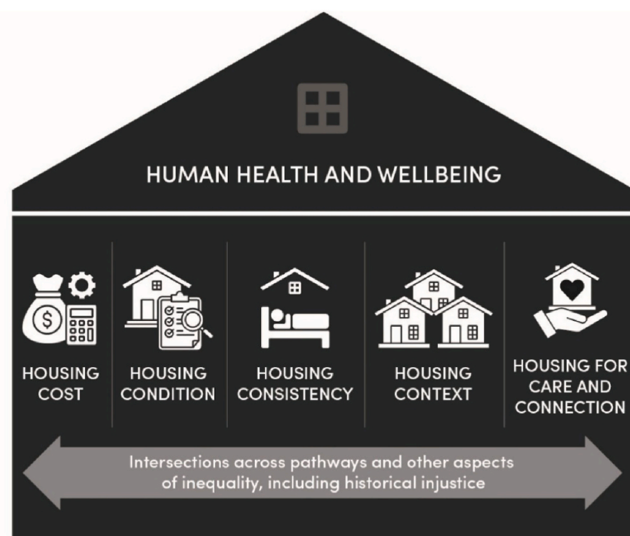

Fig. 1. Five pillars of healthy housing
Image based on Swope and Hernández's (2019) four-pillar model of housing as a determinant of health equity.

comfort, environmental toxins, safety, and accessibility impact physical and mental health, especially that of children, older adults, and those with respiratory ailments (Ahmad et al., 2020; Boch et al., 2020; Howden-Chapman et al., 2023; Northridge et al., 2010; Pineda and Corburn, 2020; White-Newsome et al., 2012). Second, residential stability, or *consistency,* is threatened by houselessness, evictions, and frequent moves that affect people's mental and physical health (Bures, 2003; Carnemolla and Skinner, 2021; Colosia et al., 2012; Gilman et al., 2003; Jaworsky et al., 2016; Ruiz-Tagle and Urria, 2022; Schulz et al., 2008; Vásquez-Vera et al., 2017). The third pillar links housing affordability or *cost* to health through the tradeoffs people make in their household budget between housing and other health-protective expenditures on food, transportation, utilities, health care, and medications (Bhattacharya et al., 2003; Maqbool et al., 2015; Meltzer and Schwartz, 2016; Pollack et al., 2010). Finally, the neighborhood or area *context* in which the house is located can limit or promote health through its natural, built, and social features, and the resources and services available. For example, proximity, access, and use of amenities such as public transportation, healthy food outlets, greenspace, and health care have been positively associated with residents' health (Diez Roux and Mair, 2010; Kershaw et al., 2024). At the neighborhood level, social characteristics such as perceived safety and crime, social cohesion, and social capital also affect residents' wellbeing (De Jesus et al., 2010; Lumeng et al., 2006; Won et al., 2016).

Disparate access to and intersections across these housing pillars, in combination with other aspects of inequality and historical injustice, create health inequity (Swope and Hernández, 2019). The benefits of care and connection cross the existing pillars. Examples include the relationships that connect people to residential weatherization programs, the supportive services that are essential to housing stability, the household relationships that drive the choices made in the tradeoffs between paying rent and paying medical bills, and the informal care networks that make neighborhoods thrive. Despite the lifespan approach of the current four-pillar model, the role of care is not highlighted, although the importance of care in housing is clear for many groups, including children, older adults, and those in any age group facing chronic disease, disability, and mobility challenges (Dunn, 2020; Milligan, 2016; Wyndham-West et al., 2022).

1.2. *Why lift up care and connection?*

According to Milligan (2014), care is "the provision of practical or emotional support to those who would otherwise be unable to undertake activities of daily life due to physical or mental disability, illness, injury, or an age-related condition" (p. 1). For many children, older adults, and individuals with a long-term illness or disability, the home is where essential care practices and relationships are enacted (Milligan, 2016). Care can be delivered by a family member and/or by formal care workers. For the latter, the home becomes a workplace that has to be safe and efficient for delivering care (Milligan, 2016). According to AARP (formerly the American Association of Retired Persons), 90 percent of US adults prefer to age in their own homes, but nearly 12 percent of adults older than 75 need help with activities of daily living, and nearly 20 percent of adults older than 75 need help with activities such as shopping, cleaning, and cooking. Often, the populations that are most reliant on informal care networks, such as older adults, low-income families, refugees and immigrants, and people with physical or behavioral health challenges, are also the focus of housing policy, e.g., people seeking housing subsidies or other forms of assistance.

Implicit in the definition of care are the relationships and informal and formal connections that structure and support care. In 2023, the US Surgeon General released a general warning on the epidemic of loneliness and urged governments at all levels to adopt a "connection in all policies" approach (Dillinger, 2023; Murthy, 2023, p. 55). Even before the isolation of the COVID-19 pandemic, half of all US adults claimed to experience loneliness (US Department of Health and Human Services, 2023). Worldwide, loneliness and isolation are associated with a 30 times higher risk of heart disease (Valtorta et al., 2016). In the United Kingdom and Japan, a minister of loneliness leads efforts to raise awareness of loneliness and isolation to counteract increasing trends (Department for Digital, Culture, Media & Sport, Office for Civil Society & Baroness Barran MBE, 2021).

Another illustration of the importance of social connection is the negative health effects experienced by residents who were forced to relocate following the large-scale demolition of public housing in the US. Scholars have attributed the negative health impact in part to the fracturing of social networks within public housing that residents relied upon for emotional support, child care, and material assistance (Keene and Geronimus, 2011; Manzo et al., 2008). This body of research documents that while most residents got access to higher-quality housing and neighborhoods after moving, more than three-fourths of residents reported no change to their health (Keene and Geronimus, 2011). Neighborhood-level displacement through mechanisms such as urban renewal (Mehdipanah et al., 2018), environmental gentrification (Jelks et al., 2021), and climate migration (Keenan et al., 2018) all offer serious and increasing public health threats to residents through the destruction of social networks and sense of belonging. Research indicates that residents forced to relocate due to gentrification often experience a sense of deep grief and loss due to severed place attachments and the loss of social and cultural connections, a phenomenon described by Fullilove as root shock (Fullilove, 2004).

2. Proposed pillar: housing for care and connection

We invite public health policymakers, practitioners, and researchers to lift up a "fifth C″ pillar of housing for health equity – that of care and connection (Fig. 1). Drawing on a social epidemiology framework (Berkman and Krishna, 2014; Jennings and Bamkole, 2019; Krieger, 2021; Leifheit et al., 2022; Marsh et al., 2015) and extending theories from Indigenous studies (Million, 2020), human rights frameworks (General Comment No. 4, 1991), universal design, and human geography (Milligan, 2016), we hold that housing is a site of connection to oneself, one's family, and the relationships of care that are central to our species' ability to thrive.

2.1. Conceptual foundations of housing for care and connection

The care and connection pillar of housing and health is embedded within several existing conceptual frameworks. To begin, *Indigenous conceptions of health* place care and relationships at the center of individual, community, and environmental wellbeing (Carroll et al., 2022; Fatima et al., 2023; Fletcher et al., 2024). Settler colonial land appropriation is at the heart of intergenerational trauma that drives health disparities across the globe (Million, 2013; Napoleon, 1991). Tanana Athabascan scholar Dian Million describes care as “at the core of what needs to be asked for in the world” in an understanding of health that is based on relationships and responsibilities (Million, 2020, 2024). Thus, Indigenous conceptions of health inform our centering of care and connection within housing as a determinant of health.

The 1991 UN Committee on Economic, Social, and Cultural Rights stated that the *right to adequate housing* includes seven criteria: legal security of tenure; availability of services, materials, and infrastructure; affordability; habitability; accessibility; location; and cultural adequacy (General Comment No. 4, 1991; Oren et al., 2022). Availability of services, accessibility, and cultural adequacy speak to the importance of our proposed care and connection pillar. In particular, cultural adequacy includes elements of housing policy and design that enable people to participate in social and cultural activities and feel a sense of connection and belonging with their neighbors (United Nations Economic Commission for Europe, 2015). As an example, in research with Roma communities in Italy, many participants viewed the available public housing options—mainly in flats or apartments—as culturally inadequate because they precluded participants from living with their extended families, constricting opportunities for caregiving relationships (Cittadini, 2022).

The goals of *universal design* also emphasize the importance of social and cultural connection. Universal design is “a design process that enables and empowers a diverse population by improving human performance, health and wellness, and social participation” (Steinfeld and Maisel, 2012, p. 29). Three goals of universal design— social integration, personalization, and cultural appropriateness –describe how social connection links the built environment to health. For example, research on the benefits of community residences for people with disabilities has demonstrated the positive impact of this strategy on the residents and their families, including improvements in independent functioning and social behavior, health, and wellbeing (Lindsay et al., 2024; Vegso, 1992).

Our work also engages scholarship on the *geography of care.* Milligan describes how “care has been interpreted within a relational framework that examines health, caregiving and the receipt of care in relation to the places in which it occurs” (Milligan et al., 2007, p. 135). A geography of care views care as structured and practiced in space and place, including the home. Through a geographical lens, care can reshape the nature and experience of home for those receiving and providing care (Milligan, 2014; Milligan and Wiles, 2010). The deinstitutionalization movement, coupled with the retreat of the state-sponsored public safety net in the US and elsewhere, results in increasingly blurred boundaries between unpaid and paid caregiving and home and institutional healthcare settings (Milligan et al., 2007). The gaps created by this system are disproportionately filled by women (K. England, 2010; P. England, 2005; Milligan, 2016). Power and Mee argue that housing should be identified as part of the infrastructure of care to expand the definition of infrastructure to better position housing and care work as recipients of public infrastructure investments (Binet et al., 2022; Milligan, 2016; Power and Mee, 2020). Thus, in framing care and connection as a pillar of housing and health, it is critical to recognize that caregiving is multifaceted and, in some instances, may function as a stressor that negatively impacts health, particularly for women and other groups disproportionately impacted by caregiving burdens and in the absence of public and community-level supports to mitigate this burden (Lawson, 2007).

2.2. Housing design, policy, and programming for care, connection, and health

Our proposed model (Fig. 2) shows the elements of housing design, policy, and programs that shape possibilities for care and connection. These opportunities affect health outcomes via social pathways and embodiment mechanisms (Krieger, 2021; S. E. Taylor et al., 1997). Our

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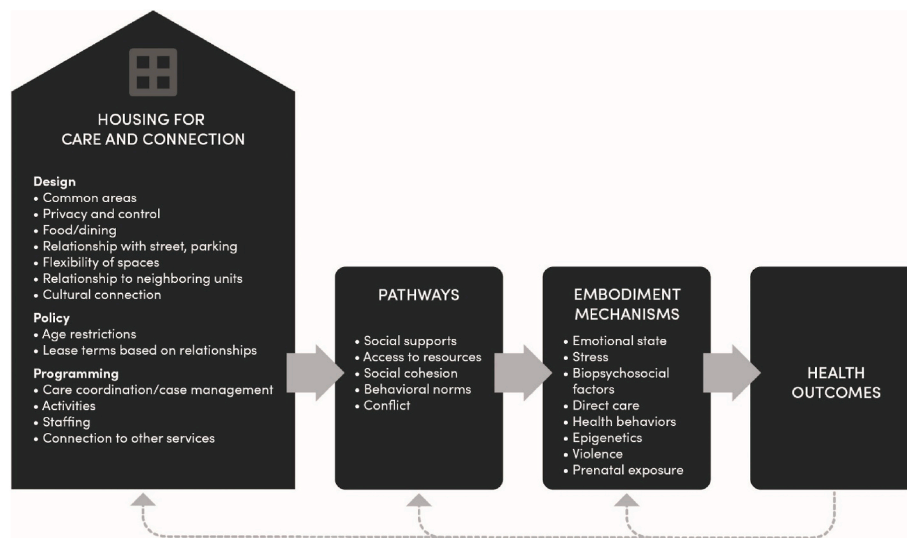

Fig. 2. Care and connection pathways between housing and health.

model draws from the field of social epidemiology, which links social and structural factors to population health (Krieger, 2001).

Housing design refers to the unit type and design, including interior design and layout; the configuration of multifamily units to each other; commons spaces, including shared entrances and hallways; and the orientation of the housing unit to the larger development or surrounding neighborhood. Housing design affects how unit occupants relate to themselves, other co-occupants, neighbors, and the larger community (Cannuscio et al., 2003). The literature we reviewed points to the need for housing design that balances privacy with opportunities for social engagement (Riazi and Emami, 2018; Watson et al., 2019). Examples of the interface between the private house and public neighborhood include the placement and presence of porches and entries, windows, shared walls, parking, and greenspace that create semipublic spaces on the edges of housing units (Khatibi, 2022). In dense multifamily dwellings, interventions like alternating doorways can preserve a sense of privacy and control (Evans et al., 2000). Design choices that increase affordability for residents and operators can compound existing inequities. For example, single-room occupancy units limit food storage and preparation and the opportunities for the health benefits of shared meals and consequent social connection for a resident population that is already more likely to be food insecure (Bowen et al., 2016). Attention to elements of design to facilitate both connection and privacy for multi-occupant dwelling units is especially important as this unit type becomes more common (Kristof, 2023).

Housing policies refer to the rules that regulate who can live in a housing unit or development and under what circumstances. Housing policies, especially for people who are low-income or housing insecure, strongly influence residents' ability to build and maintain relationships. Subsidized housing and emergency shelters often have rules that force occupants to choose between their relationships and a place to live. One example is that there are few emergency shelters where couples and children can stay together, as most programs have eligibility restrictions by gender or age (Family Promise, 2022). Another example is that a single adult who qualifies for housing assistance through the US Department of Housing and Urban Development (HUD) may lose eligibility if they choose to marry or cohabitate because combined income exceeds eligibility thresholds or if dual-occupancy subsidized housing is unavailable. The impact of care and connection extends beyond human household members. Pet restrictions limit people's opportunities to enjoy the mental and physical health benefits of pets, pose a barrier for people existing homelessness, and can inhibit evacuation from homes in disaster situations (Montgomery et al., 2024; Rook and Jegatheesan, 2024). Local zoning policies also dictate who can live in multigenerational housing based on a limited definition of family (Moore v. City of East Cleveland, 1977). Modes of caregiving and receiving become more regulated in subsidized arrangements, creating the implicit value that households can only buy their way into housing that supports their relationships.

Housing programming refers to the staffing and structured programming that is present or not in many housing developments. Examples include door attendants, security officers, and building supervisors in multifamily buildings, resident engagement coordinators and case managers in supportive housing programs, and assisted living homes' 24/7 staffing and programming. The intensity and quality of the services and relationships engendered through housing programming have profound implications for care. Some residents may perceive relationships with residential case managers as caring and supportive. In contrast, others report feeling dismissed, judged, or surveilled by staff, ultimately contributing negatively to their health and quality of life (Pilla and Park-Taylor, 2022; Willis et al., 2023). Research conducted in public housing for lower-income seniors in Canada noted that caseload size, time constraints, and historical mistrust often presented barriers to service coordinators' ability to build trusting and caring relationships with residents (Sheppard et al., 2023). Housing programming that intentionally intervenes in the social and care environment of the home is an opportunity to account for health inequities. Subsidized multifamily developments by nonprofits or community development organizations frequently offer programs such as financial education, childcare, food distribution, or community gardening that also serve as a vehicle for health promotion (Cho, 2020; Gray et al., 2014). Home care and telehealth provide an opportunity to improve health for people who actively avoid medical settings for their health care due to past trauma or mental illness (Gerber et al., 2020; Kopelovich et al., 2021).

2.3. From care and connection to health equity

As shown in Fig. 2, we propose that care and connection in housing affect health through five established social epidemiological pathways: *social supports, behavioral norms, access to resources, social cohesion*, and *conflict* (Berkman and Krishna, 2014; Jennings and Bamkole, 2019; Killam and Kawachi, 2022; Marsh et al., 2015; Romagon and Jabot, 2021; Rusinovic et al., 2019). These five pathways are embodied through mechanisms such as increased stress, health behaviors, biopsychosocial factors, prenatal exposure, emotional states, epigenetics, and interpersonal violence (Berkman and Krishna, 2014; Fedina et al., 2022; Krieger, 2005; S. E. Taylor et al., 1997). In the social epidemiological literature on housing, care, and health, these embodiment mechanisms lead to health outcomes such as improved or decreased self-rated health, mental health, and general wellbeing. As an example of how the design and programing of multifamily apartment buildings shape opportunities for health along the pathway of *social supports*, research shows that high-rise apartment living is worse for mental health than single-family or three to four-unit multifamily housing, with social isolation, lack of easy access to green space, and crowding being potential moderators (Evans et al., 2003). An illustration of the *behavioral norms* and *conflict* pathways is that most multifamily apartment dwellings have an onsite building manager or landlord who negotiates the day-to-day social challenges of higher-density living, a relationship that has impacts on self-reported health and wellbeing (Rolfe et al., 2020). Building managers also are the conduit for tenants' *access to resources,* such as maintenance and payment plans.

While the model we propose in Fig. 2 depicts a bounded linear connection between care and connection in housing and health outcomes, we recognize the more complex reality: that pathways between housing for care and connection and health are bidirectional, nuanced, influenced by and influencing other housing pillars, and situated within larger systems and structures that contribute to inequities. We illustrate these pathways and mechanisms in more detail with the following case examples.

3. Housing for care and connection: two examples

3.1. Permanent Supportive Housing

Permanent Supportive Housing (PSH) programs link people experiencing homelessness with independent housing in subsidized apartments with as few barriers to entry as possible. PSH paradigms also include case management *programs* to connect people with health and social services and help PSH residents achieve their goals. PSH providers in the US have the option of using a scattered site *design*, in which residents choose an apartment in the community that meets program guidelines in terms of rental cost and safety, or a single-site model, in which the organization administering the program designates an entire multi-unit building or portion of a building as PSH (Homelessness Policy Research Institute, 2019). PSH residents can have a substantial degree of choice in where their unit is located and other factors, such as décor and furnishing (Chan, 2020; Rollings and Bollo, 2021). In terms of program *policy*, PSH residents also have considerable control over their social relationships, determining when guests can visit and spend time in their unit and when they want privacy—albeit often with limitations. For example, Indigenous residents of a PSH program in Winnipeg, Canada,

reported feeling surveilled by landlords and being restricted from hosting visiting friends and relatives. This prohibition conflicted with their culturally rooted notions of home, belonging, and care (Alaazi et al., 2015). Many PSH programs are designed for single adults (Rollings and Bollo, 2021), thus preventing participants from living with or hosting significant others, children, or family members—a far-reaching limitation on PSH residents' ability to give and receive care (Driscoll et al., 2018). Regarding *programming*, the structure and intensity of supportive services that PSH residents receive vary widely (Henwood et al., 2018).

The *housing design*, *policy,* and *programs* offered in PSH offer opportunities for health across the five pathways identified in our model in Fig. 2. PSH case managers offer *access to resources,* such as housing, employment, and behavioral health programming that are opportunities for health. While supportive services such as case management offer a conduit for enabling care and connection, some PSH residents report feeling a lack of connection and empathy from case managers and other PSH staff and also felt that high turnover rates and large caseloads made it challenging to make lasting personal connections with staff (Pilla and Park-Taylor, 2022). PSH residents who reported less drinking also reported more *social support* from staff members, family, and friends (Driscoll et al., 2018). In contrast, residents who increased alcohol consumption reported the influence of others in the housing site who drank, an example of *behavioral norms* (Driscoll et al., 2018). As Driscoll notes in the evaluation of two Housing First programs in Alaska, "The goal of moving out was most often linked to the ability to host family and friends without regulation and was often cited in relation to both sites' restrictive visiting policies" (p. 38). One of the main challenges that newly housed residents face is loneliness resulting from isolation from the community that supported them on the street (Brocious and Erisman, 2020). As an example of *social cohesion* and *conflict*, some PSH residents find a sense of community with neighbors in their buildings, while others report feeling unsafe or threatened by occupants or guests in neighboring units (Chan, 2020).

PSH also demonstrates how the connections between housing and health via care and connection are bidirectional and may create positive or negative feedback loops (Leifheit et al., 2022). For example, when case managers support people experiencing homelessness to find and stay in permanent housing, they obtain a permanent address, which facilitates access to employment, health resources, and public services. Healthier people can stay employed and pay for housing. In sum, PSH presents a proverbial mixed bag regarding its implications for care and connection, which we hypothesize may underlie the inconclusive findings regarding whether PSH is associated with long-term improved health for its residents (National Academies of Science, Engineering, and Medicine, 2018). Future research could analyze the constraints or opportunities that PSH provides for care and connection through design, policies, and programming to understand if and how this helps to explain the variation in PSH residents' health outcomes (Carnemolla and Skinner, 2021).

3.2. Aging in the right place

Aging in place refers to strategies and goals related to people's ability to age in their homes, maintain independence, and access help as needed (Forsyth and Molinsky, 2021; National Institute on Aging, 2023). Housing for people as they age exists along a continuum from independent housing to age-restricted housing (with or without services) to assisted living, memory care, and nursing homes. The goal of aging in place is not necessarily independence but rather aging in the right place (Canham et al., 2022). While a complete description of this continuum is beyond the scope of this paper, researchers have found that relationships are often more important than the physical environment of their home for older adults (Street et al., 2007). Variations in *housing design,* internal *policies*, *programming,* and staffing related to care and connection affect the health outcomes of older adults across the continuum of care. Colloquially termed mother-in-law apartments or small self-contained housing units collocated with single-family dwellings are designed to facilitate informal caregiving and social support for older family members as they age (Liebig et al., 2006). Age-restricted housing developments, both in low-income senior housing and middle-class retirement communities, limit the proximity of intergenerational relationships, with consequences for loneliness and social support (Bernard et al., 2007; Jiménez and Cancino-Contreras, 2021; Lyu and Forsyth, 2022).

Building or retrofitting homes to include basic accessibility *design* features can also increase the participation and inclusion of older adults and people with disabilities in community life (Bouldin et al., 2015; Maisel, 2006). For example, home modifications, such as ramps and doorway size, have health benefits through reduced falls and increased social engagement (Aplin et al., 2015). Structured *programs* in senior housing also foster relationships that allow older adults the opportunity to give care, which is vital for mental health as people age (Willis et al., 2023). In nursing homes, where private space is limited, the design of shared spaces such as lounges and dining rooms, wide hallways, seating options, and clear wayfinding, and the layout of units (courtyard vs. corridor) increase *social cohesion* and affect residents' and caregivers' relationships and wellbeing. Models designed around small "neighborhoods" of eight to 12 residents and consistent staffing can facilitate *social cohesion* and connections that are essential to health beyond the benefits of direct care and *social support* (Cannuscio et al., 2003; Cohen et al., 2016). Areas where care staff can rest provide opportunities for improved mental health and care relationships (Anderson et al., 2020). Safer sex programs offered in senior living communities can make wearing protection part of the *behavioral norms* and lead to reduced incidence of sexually transmitted diseases (Co et al., 2023).

Access to the opportunity to age in the right place is a health equity issue. For older LGBTQ adults living in age-restricted senior housing, programmed care relationships in the building development are meaningful because this population is more likely to be single in old age and/or dependent on friends for informal caregiving rather than a domestic partner (Lottmann and King, 2022; Willis et al., 2023). Older women who live alone have an increased risk of poor health outcomes, often related to access to care (Forward et al., 2022). Lower-income older adults are more likely to be renters and dependent on a building manager for unit upkeep. Lastly, paid and unpaid care providers may be less likely to provide care in living conditions they perceive as unsafe or unsanitary (Sheppard et al., 2022).

4. Discussion

4.1. Potential critiques and limitations of a five-pillar model

Although we believe that adding a fifth pillar that highlights the importance of care and connection holds value, we recognize some limitations to our proposed model. One critique might be, why not integrate care and connection into the existing housing *condition* pillar (Swope and Hernández, 2019; L. Taylor, 2018)? While this pillar is one of the most cited and explicit connections between housing and health (Howden-Chapman et al., 2023; Thomson et al., 2009; World Health Organization, 2018), the focus on the physical conditions–such as indoor air quality, lead paint, and weatherization–overlooks the human relationship element that is fostered in the less tangible aspects of housing quality, especially for marginalized populations (Rolfe et al., 2020). Another argument of critique would be to nest care within the area *context* pillar. Ample research shows the impact of the neighborhood social environment on health (Carpiano, 2006; Diez Roux and Mair, 2010; Jennings and Bamkole, 2019; Pérez et al., 2020; Sui et al., 2022). However, accounting for care and connection within the home or housing development largely disappears under the current four-pillar framework. Emphasizing the actual mechanism – care and connection in the home environment– allows policymakers to better allocate

funding and regulatory change to support interventions that leverage this relationship.

While there is substantial research documenting the importance of care and connection for health within the housing context, few studies to date systematically assess all the elements included in Fig. 2. Therefore, further research is needed to validate and refine the relationships we propose in Fig. 2 between elements of housing design, policy, and programming; pathways; embodiment mechanisms; and health and equity outcomes. Another limitation reflects the challenge of capturing the many nuanced ways in which care and connection in housing may impact health. Every caregiving relationship is unique; a single caregiving relationship may endure times of challenge in which the caregiver and/or care recipient's health suffers, as well as better times in which the health of both parties is enriched through the relationship. Thus, we caution against oversimplifying the relationships between housing, care, connection, and health and encourage the use of methodologies such as ethnography to capture these nuances of lived experience.

4.2. *Implications for public policy in the United States*

The US context is peculiar among high-income countries because it lacks comprehensive government-sponsored health care, social services, and public housing (Buchholz, 2021). Instead, these programs and services are delivered through a fragmented system involving a disparate number of public and private entities and funding streams. Increased coordination is needed between the four primary agencies subsidizing housing for care in the US: The Department of Housing and Urban Development, the Department of Health and Human Services, the Department of Agriculture, and the Internal Revenue Service. Further, although the US outlaws many forms of discrimination in housing through civil rights legislation, it does not have national legislation recognizing housing as a human right and does not guarantee housing assistance as a public benefit. Although we believe that moving toward a rights-based approach to housing is ultimately needed to improve housing access and health equity across all five pillars, we offer the following (non-comprehensive) recommendations for strengthening care and connection in housing within the current policy landscape.

US housing policy continues to privilege nuclear family care relationships through single-family zoning and subsidies. Housing funding mechanisms in the US could be adjusted to foster opportunities for social connection. One example of this is the Internal Revenue Service's low-income housing tax credit program (LIHTC), which is the primary vehicle for affordable housing development in the US (Urban Institute and Brookings Institution, 2020). State governments award LIHTC funding through a competitive process that can incentivize maximizing individual unit count to the detriment of common areas where social connections might occur. The criteria by which projects are ranked varies by state. For example, new developments in New York State must provide common areas. However, increased mandates on common spaces in LIHTC projects in communities with weak markets could result in fewer housing units overall, as developers choose not to propose projects because of poor financial returns. In these communities, a neighborhood-based approach to facilitating connections and care would be optimal. Greater flexibility in state-level LIHTC funding formulas could enable projects to implement plans that mix individual units and common areas in creative ways to facilitate care and connection based on the specific needs and input of the community.

One model for this flexibility in funding is based on the principle of self-determination. Tribally designated housing entities administer federal funds under Indian self-determination policies Native American Housing Assistance and Self Determination Act, 1996. The Native American Housing and Self Determination Act (NAHASDA) stipulated that federal housing funding be given as a block grant to tribes to spend as best fit, rather than the former model where HUD ran housing programs and built houses on reservations and tribal land (Immonen, 2021). While vastly underfunded (National Low Income Housing Coalition, 2024), the use of NAHASDA funds has recently resulted in culturally relevant projects that meet the housing needs, including those related to care, of occupants (U.S. Department of Housing and Urban Development Office of Policy Development and Research, 2013).

Changes at the state and local level should be made to support the relationships central to specific populations. In one novel program, city housing inspectors responding to housing quality issues connected residents to social services that supported their health through food and rent assistance and health care access (Robb et al., 2021). At the housing development level, providers should be mindful of the relationships within the household and neighborhood. Policies and designs should support privacy, control, useability, and social participation, especially in multifamily buildings. Community housing needs assessments and, increasingly, state housing action plans drive affordable housing policy in the US and Canada. However, these assessments overwhelmingly focus on the quantitative and physical aspects of the house: how many units are needed, how many rehabs, and at what scale (Fritzel et al., 2020). Recognition of our proposed fifth pillar would suggest that people are also asked about design, policy, and programs internal to the housing development during housing needs assessments. This is especially important in communities that are continually marginalized by assumptions that homogenize low-income housing residents (Luo, 2016).

Policy at federal, state, and local levels should promote opportunities for co-design, given increasing evidence that co-design processes for new construction and remodels, sweat equity projects, and shared equity homeownership models facilitate social capital and the possibility of attendant health outcomes (Aplin et al., 2015; Larcombe et al., 2020; Lubik and Kosatsky, 2019; van den Berg et al., 2021). Since social processes produce the designed environment, if elements of society are not well represented in the process, their perspective will not be well represented in the final product. Designers, therefore, have learned the value of citizen and end-user participation. Co-design is critical to developing housing that is culturally adequate and should include thoughtful attention to the design of both private and communal spaces to empower residents to make choices about where, when, and how they interact with staff, family members, and other residents (Shopworks Architecture et al., 2020; Sukhwani et al., 2021). Due to constraints of budgets or time, it is not always possible to involve end users in the design process, and not all end users want to be involved. However, finding ways to obtain the perspective of housing users is an essential part of universal design practice and is one way to build the care and connection pillar of housing for health equity.

5. Conclusion: Toward housing for health equity

At the conclusion of their influential paper, Swope and Hernández (2019) call for increased research into interventions across the four pillars to address the root causes of health inequity. Our paper situates housing for care and connection as an area of intervention that can be applied across housing design, programming, and policy to strengthen the relationships that support human wellbeing. Attending to care and connection in the context of housing recognizes the interdependence of human lives and challenges the constraints on these relationships that marginalized groups all too frequently endure. Without attention to care, interventions addressing housing conditions, affordability, stability, or neighborhood context alone will likely fail to achieve lasting health benefits. Attention to this pillar is a critical step toward health equity and fulfilling the goal of housing as a human right.

CRediT authorship contribution statement

Meghan Taylor Holtan: Writing – review & editing, Writing – original draft, Conceptualization. **Elizabeth Bowen:** Writing – review & editing, Writing – original draft, Conceptualization. **Jordana Maisel:**

Writing – review & editing. **Mylene Riva:** Writing – review & editing, Conceptualization.

Declaration of competing interest

None.

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Data availability

No data was used for the research described in the article.

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