



Review Article

Housing Models Promoting Aging in Community-A Brief Report on Key Lessons Learned

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Abstract

The majority of older adults prefer aging in their own homes or communities. Four promising housing models promoting Aging-In-Community (AIC), including the village, Naturally Occurring Retirement Community (NORC), senior cohousing, and University-Based Retirement Community (UBRC) were reviewed. A total of 34 unduplicated empirical studies were found to examine the impact of these models including enhancing social support and improving older adult's well-being, remain independence at homes and community social and civic participation. It is critical to update current knowledge to capture emerging research areas and lessons learned for housing and community developers, and policymakers to consider for addressing the critical and growing aging in community needs.

Keywords: Aging in community; Housing models; Naturally Occurring Retirement Community (NORC); Senior cohousing; University-Based Retirement Communities (UBRC); Villages

Introduction

Aging In Community (AIC) is a movement that allows like-minded older adults to come together to create mutual support systems. It aims to enhance older adults physical and emotional well-being, improve quality of life, and maximize the ability to remain in their homes and communities and delay the need for institutional care [1,2]. Thomas & Blanchard [3] identified six criteria critical to provide a high-quality AIC environment: (1) Inclusive: include people of all ages, races/ethnicities and functional abilities; (2) Sustainable:

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residents live in a lifestyle that is sustainable environmentally, economically and socially; (3) Healthy: community and programs that support the mind, body, and spirit wellness, and individuals with illness or disability; (4) Accessible: universal design features and easy access to the home and community, such as wheelchair-friendly; (5) Interdependent: fostering reciprocity and mutual support; and (6) Engaged: promoting community participation [3].

With these six criteria in mind, existing studies in the U.S. pointed to four promising housing models that have the potential to achieve AIC, including the village model, Naturally Occurring Retirement Community (NORC), senior cohousing, and University-Based Retirement Community (UBRC) [1,4-7]. The village model is a consumer-directed organization that provides a combination of social engagement, member-to-member support and collective bargaining for discounted services [8]. NORCs are communities with a high concentration of older adults, allowing organizations to achieve efficiencies in health and social services provision for older adults [9]. Senior cohousing is built based on older adults' common interests to create an age-friendly environment, and explicitly focusing on making social connections and mutual support a priority [1,10,11]. UBRC provides lifelong learning opportunities, campus recreational activities and sometimes university-affiliated hospitals to older adults [12,13].

The primary goal across the village model was to provide services to its members such as educational events or village-sponsored social events [14] to support social engagement to reduce social isolation among aging adults. However, each village organization operated differently as each village is developed and adapted to serve its neighborhood areas [15]. Thus, only services that are needed by the members in their community were provided. Additionally, the village programs tend to focus more on social connections than health improvement initiatives when compared to the Naturally Occurring Retirement Community (NORC) model [5,6]. The senior cohousing model promotes social resources to reduce social isolation [16], whereas the University-Based Retirement Communities (UBRC) provides access to university resources and allows aging adults to live with others who share similar backgrounds [17].

Hou and Cao [5] recently conducted a systematic (macro) comparative review on these promising AIC models analyzing core model characteristics and member profiles including push-pull factors to join from older adults' perspectives. In this macro-level comparative review of promising AIC models, researchers noted each housing model has a unique way of helping older adults with their aging needs to potentially reach better Person-Environment (P-E) fit [4,5]. This is a follow-up brief report to highlight the (micro) empirical studies examining these four AIC housing models with a focus on key research findings and lessons learned including challenges and recommendations. Findings will update the current state of AIC research on important topics to maintain independence and well-being, as well as strengthen community social and civic participation among community-dwelling older adults. In addition, unique challenges and recommendations by each promising AIC model reviewed are summarized to help sustain these community-based programs.

Method

We conducted a 20-year literature review (2000-2020) and formulated two research questions: (1) What are the merging research areas and key findings from data-based empirical studies on these four promising AIC models? (2) What are major challenges and recommendations from existing data-driven research studies? We searched eight scientific databases including CINAHL, ERIC, Abstracts in Social Gerontology, MEDLINE, Social Work Abstracts, Academic Search Premier, Art & Architecture and Google Scholar. All English journal articles and dissertations published between January 2000 and December 2020 were included. The inclusion criteria were: (1) empirical data-based article discussed one or more of the four promising AIC models discussed above, (2) study population was in the U.S., and (3) full text was available.

We combined the phrases “village model or villages” or “naturally occurring retirement community or NORC” or “cohousing” or “University-based retirement community or college-based retirement communities” in the title and “aging in place or aging in community or older adults or elderly or older adults” in keywords. We searched each AIC model separately in each database to ensure the comprehensiveness of relevant articles identified. Our initial search yielded 177 articles. Articles with no full-text or non-U.S. studies were excluded (n=122). After exclusions, 55 articles met the criteria for a full article review. Additionally, 25 articles, which were not data-driven empirical studies, were excluded and four articles were added after checking the reference list and searching for key authors’ publications. A final total of 34 un-duplicated articles were identified (11 village, 12 NORC, 1 village and NORC, 7 cohousing & 3 UBRC articles) and were included in this review and analyses. One article discussed both the village and NORC models [14], and was analyzed in both models. Thus, the article counts were 12 village and 13 NORC articles in table 1.

Results

We organized this comparative review of empirical studies by focused areas, key findings, challenges and recommendations. Tables 1a-1d highlighted these aspects by individual studies within each model. Table 2 synthesized results of these areas across studies by each model.

Focused areas

The review showed variation in the research areas. Village studies focused on service utilization, member characteristics, quality of life and wellbeing, member engagement and connection, remain independence at home, types of model, and funding sources [6,15,18-21,24,27]. The NORC model also focused on service utilization and member engagement, but there was a heavier focus on program evaluation and sustainability, activity participation, reduced social isolation, physical and social environment, or draws to a NORC, [28-33,35,37,38]. Senior cohousing mainly focused on social resources, a sense of community and mutual support [10,16,31,40-43]. However, senior cohousing studies also examined previous experiences of loneliness, perceived support, as well as place attachment [37,43]. According to Glass [37], residents with attachments to their neighbors and their neighborhood felt less lonely than their counterparts without such attachments. These attachments were fostered through shared events and frequent interactions within the community, which created stronger relationships between the residents and the place or community [37]. The UBRCs focused on motivation to relocate, university

environment and culture, and intergenerational classroom format. The university provides the opportunity to learn while aging and fosters intergenerational interactions that allow these aging adults to learn and build connections [17,44,45].

Key findings

Study outcomes related to the village organizations show that village membership increased the sense of community, connection, quality of life and willingness to rely on others [6,18,19,22]. Although each village is different [15,46], studies show 89% of village members have used at least one village service in the last year [20] and 93% of villages held social, cultural and recreational gatherings [25]. Younger members reported increased social and civic engagement while older members were more likely to perceive improvements in their medical care access and mobility [22]. Evidence further shows pre-old and single women were more likely to join the village programs [18], and village services maybe promising to maintain perceived high quality of life till 85 years old [19].

NORC members were drawn to these organizations for the environmental characteristics such as views. Studies found the members engaged in at least one leisure activity [37]. This structure has allowed for the development of activity-based friendships to increase social connections. Researchers found NORC members reported an increased level of satisfaction with recreational activities and their social life [34]. Members were more likely to leave their homes and reported feeling happier since they joined community partners, which is an organization that provides services and activities through the NORC to allow older adults to remain in their homes [34]. Empirical data shows active participation varied by personal need. For example, some members participated less because they had established social networks outside of the NORC such as a church [28]. On the other hand, some members participated more due to changes in their lives such as retirement and desires for more social engagement [28].

Studies show cohousing improved older adults’ sense of community, mutual support, prevent social isolation, and improve autonomy and independence [10,39,44,47]. Glass [39] found that older adults moved to cohousing to pursue a sense of community. After moving in, 98% of cohousing residents were satisfied with their experiences and expressed less loneliness. Cohousing studies also showed that members of these organizations were more likely to give as well as to receive socially supportive behavior than their counterparts who were not engaged in cohousing [40]. Cohousing members felt safer, experienced more mutual support, were less worried, and felt less isolated when in these communities [41]. According to Glass [10], approximately 80% of Cohousing members were very likely to ask other older adult members for help.

UBRC studies mainly focus on intergenerational interaction, older adults’ role and lifelong learning [45]. Older adults responded positively towards intergenerational learning activities and looking for more similar opportunities [45]. Studies found that an age-friendly intergenerational classroom can enhance intergenerational interaction and benefit both older and young adults, allowing older adults to achieve personal growth, self-actualization and social integration [17,45].

Challenges & Recommendations

Each model faces its own set of challenges. For example, the village model leans heavily on membership dues for their funding and

Village Model (N=12)					
	Focused Areas	Sample	Key findings	Challenges	Recommendations
Hou [18]. Remain independence and neighborhood social cohesiveness among older adults participate in three community-based programs promoting aging-in-community. Gerontology & Geriatric Medicine.	<ul style="list-style-type: none"> Remain Independence (RI) Neighborhood Social Cohesiveness (NSC) Aging-In-Community (AIC) programs 	Older adults from three AIC programs were surveyed: a village program, a county neighborhood lunch program, and a university-based lifelong learning program (total n=289)	<ul style="list-style-type: none"> significant inter-group differences remained for RI after controlling demographics Lower education participants had higher RI Married participants had higher NSC 	<ul style="list-style-type: none"> RI is a dynamic and subjective perception Cross-sectional study limitation 	<ul style="list-style-type: none"> Attentions to remain independence among higher education participants Attention to social cohesiveness among older single participants More representative samples from larger national studies are needed to further examine these important AIC issues. Longitudinal study to examine important AIC factors across programs
Hou [6]. Remaining healthy and independent by age group among a Florida village sample – A Convergent Mixed Methods Study. International Journal of Gerontology Special Issue	<ul style="list-style-type: none"> Remain independent Healthy aging dimensions 	96 active village members from two Villages	<ul style="list-style-type: none"> Results showed remain independence were significantly varied by age groups (young old scored higher than the old, & the oldest-old groups) Young old group scored higher on FAITH than the pre-old group 	<ul style="list-style-type: none"> Barriers varied by age Participants desired social connections, regardless of age 	<ul style="list-style-type: none"> FAITH was an important dimension to exam further by age group. Future research should explore the five essential dimensions of lifestyle towards healthy aging.
Hou [19]. The age factor – A mixed methods study on quality of life among the young old, the old, and the oldest-old among a village sample. The Annual Global Healthcare Conference Proceedings	<ul style="list-style-type: none"> Quality of life (QOL) Aging in place (AIP) Barriers Age factor 	96 active village members from two Villages	<ul style="list-style-type: none"> QOL remained high across pre-old, young old, and old age groups QOL significantly dropped in the oldest-old age group Health issue was the biggest concern among old and oldest-old The second biggest concern was house mobility (i.e. stairs for pre-old and young old) House maintenance among the “old” participants The oldest-old used more personal care and companionship services. 	<ul style="list-style-type: none"> Providing age-tailored services 	<ul style="list-style-type: none"> More village studies and larger study samples are recommended. To better sustain the services and care needs, village programs may need to think about tapping into the resources and energy of the pre-old and the young old groups, to better support the growing need of the oldest-old members.
Gammonley, et al., [20]. Anticipated Engagement in a Village Organization. J of Social Service Research	<ul style="list-style-type: none"> Anticipated Engagement 	193 community residing older adults	<p>More willing to join the village:</p> <ul style="list-style-type: none"> More engaged in preventative & health behaviors Have adequate resources and identify potential benefits for enrollment Member characteristics matter 	<ul style="list-style-type: none"> The oldest group of participants, aged 85 and above, were less likely to consider engagement with a village 	<ul style="list-style-type: none"> Identify how factors such as income and personal health practices contribute to interest in village membership.
Graham, et al.,[21]. Impact of the village model. J of Gerontological Social Work	<ul style="list-style-type: none"> Social connection Civic engagement Health QOL Service access AIP factors 	1,753 current members from 28 villages	<ul style="list-style-type: none"> Village membership increased participants’ sense of connection and willingness to count on others Younger village members reported moresocial/ civic engagement than the oldest Older members perceived more improvements in medical care access and mobility. 	<ul style="list-style-type: none"> The oldest members and those in poor health, perceived lower sense of connection Ways to continue promote social engagement as members age, health worsens, and experience more barriers to engage 	<ul style="list-style-type: none"> Assess changes in member health and social functioning associated with village membership Longitudinal studies and suitable comparison groups

<p>Lehning, et al., [15]. Variations on the Village model J of Applied Gerontology</p>	<ul style="list-style-type: none"> Types of the Village model 	<p>80 Village representatives from Village-to-Village Network (VtVN)</p>	<p><i>Prototypic village</i></p> <ul style="list-style-type: none"> High Member involvement, Volunteers (provider), Membership dues/fees <p><i>Village with external funding</i></p> <ul style="list-style-type: none"> High Member involvement, Volunteer (provider), grants <p><i>Aging services with member funding</i></p> <ul style="list-style-type: none"> Low Member involvement, Professionals (provider), Membership dues/fees <p><i>Aging services Organization</i></p> <ul style="list-style-type: none"> Low Member involvement, Professionals (provider), Grants/ donations 	<ul style="list-style-type: none"> Each Village does not fully reflect all aspects of the Village model. Villages shared characteristic: providing services. Unclear whether there is a distinct Village model and if Villages can be considered a single organizational model or collection of organizations with overlapping principles 	<ul style="list-style-type: none"> Longitudinal studies to examine the relationship between Village types and long-term sustainability and effectiveness. Qualitative studies to gather information on the lived experiences of Village leaders
<p>Graham, et al., [22]. Do villages promote aging in place? J of Applied Gerontology</p>	<ul style="list-style-type: none"> AIP confidence social connection health 	<ul style="list-style-type: none"> 222 Village members from 7 Villages 	<ul style="list-style-type: none"> Improved AIP confidence, perceived social support, and less intention to relocate. No improvements in health or social connectedness. 	<ul style="list-style-type: none"> Villages focus primarily on meeting the social needs rather than the health-related needs of older adults. 	<ul style="list-style-type: none"> Longitudinal studies to examine the effectiveness of villages in preventing institutionalization over time.
<p>Lehning, et al., [23]. Perceived challenges to sustainability. Journal of Gerontological Social Work</p>	<ul style="list-style-type: none"> Major challenges sustainability 	<ul style="list-style-type: none"> 80 Village representatives from VtVN 58 participated in the follow-up survey 	<ul style="list-style-type: none"> 19%–35% of Villages indicated that volunteers, membership diversity, community infrastructure staffing, adequate services, and collaborations were major challenges. 	<p>Identified challenges:</p> <ul style="list-style-type: none"> (a) funding (b) membership recruitment (c) leadership development (d) meeting members' service needs (e) limitations of the Village model itself. 	<ul style="list-style-type: none"> Assess the needs of members and the larger community Modify the Village model to meet local needs. Recruit new members & encourage existing members to volunteer Advocate for government funding
<p>Graham, et al., [24]. The impact of the "village" model on health, well-being, service access, and social engagement. Health Education & Behavior</p>	<ul style="list-style-type: none"> Health Well-Being Services Access Social Engagement 	<p>282 active members in 9 Villages</p>	<p><i>Promote social engagement and services accessibility</i></p> <ul style="list-style-type: none"> 90% used at least one service in the past year More impacts in more involved members <p><i>Increases AIP confidence</i></p> <ul style="list-style-type: none"> 77% reported more likely to AIP 	<ul style="list-style-type: none"> Village has less impact in members with poorer self-reported health 	<ul style="list-style-type: none"> Examine the long-term effectiveness of the Village model Services to help more vulnerable members AIP
<p>Scharlach, et al., [25]. Does the village model help to foster age-friendly communities? J of aging & social policy</p>	<ul style="list-style-type: none"> Age-friendly communities (AFC) 	<p>69 Village Representatives</p>	<ul style="list-style-type: none"> Most Villages are AFC 85.5% Villages aided with at least six of the WHO domains strengthen social relationships and reducing social isolation 93% villages offered social, cultural, or recreational gatherings 	<ul style="list-style-type: none"> Lack of program evaluation regarding how aging-friendly domains may affect older adults' AIP ability 	<p>n/a</p>

Greenfield, et al., [26]. A tale of two community initiatives for promoting aging in place. The Gerontologist	<ul style="list-style-type: none"> • Services and activities • Beneficiaries • Funding 	69 village representatives	<ul style="list-style-type: none"> • Promoting access to services • Strengthening social relationships and reducing social isolation • Village members who were younger, less functionally impaired, and more economically secure were more likely to participate activities than NORC participants 	<ul style="list-style-type: none"> • Provide intensive health and social services as members get older • Economic vulnerability • Emphasis on volunteers, limited access to professional help • Difficult to engage those with limited time and money. 	<ul style="list-style-type: none"> • Additional community volunteer involvement • Partner collaborations • Diversified funding sources
Scharlach, et al., [27]. The “Village” model. The Gerontologist	<ul style="list-style-type: none"> • Types of village model 	30 village directors	<ul style="list-style-type: none"> • Most operate autonomously, rely primarily on member fees and donations. • Members involved in organizational development and provide services • Members mostly aged 65+ years, white, homeowners, with lower care needs overall. 	<ul style="list-style-type: none"> • Organizational development • Funding • Recruitment • Community barriers • Diversity 	<ul style="list-style-type: none"> • Organizational sustainability may be promoted through affiliations with social service agencies and other assistance. • Evaluation on village impact on members’ ability to AIC& sustainability of the village model.

Table 1A: Village articles.

NORC-SSP (N=13)					
	Focused Areas	Sample	Key findings	Challenges	Recommendations
Greenfield & Mauldin [28]. (Participation in community activities through NORC Supportive Service Programs. Ageing & Society	<ul style="list-style-type: none"> • Factors influence activity participation • The meaning of the social contact. 	<ul style="list-style-type: none"> • 41 residents 	Meaning of the social contact <ul style="list-style-type: none"> • Replicating existing contacts • Sense of community • Activity-based friendships • Independent friendships • Perceptions of program attendees 	<ul style="list-style-type: none"> • Social connectedness does not mean the same thing to everyone 	<ul style="list-style-type: none"> • Offer group activities to enhance older adults’ social integration • Hiring, training, and supporting staff skilled at delivering particular services • Practitioners should help older adults overcome environmental barriers to participate • Staff should recognize their influence on older adults’ social relationships
Greenfield & Frantz [29]. Sustainability processes among naturally occurring retirement community supportive service programs. J of Community Practice	<ul style="list-style-type: none"> • Challenges • Sustainability 	<ul style="list-style-type: none"> • 53 NORC-SSP leaders 	Challenges & strategies for sustainability: <ul style="list-style-type: none"> (a) the importance of programs and services that attract participants, having the appropriate staff, insufficient financial resources (d) developing meaningful inter-organizational partnerships (e) engaging volunteers, (f) the importance of older adults’ utilization of services for garnering future resources (g) being responsive to the community (h) facilitating older adults’ contributions to the program as volunteers and advocates. 	See outcome.	<ul style="list-style-type: none"> • Offering attractive programs and services

<p>Greenfield [31]. Community aging initiatives and social capital. J Applied Gerontology</p>	<ul style="list-style-type: none"> • Social capital • Program evaluation 	<ul style="list-style-type: none"> • 10 lead agencies representing 15 NORC programs in New Jersey. • Qualitative study 	<p>NORC programs enhances social relationship in 4 domains, including:</p> <ul style="list-style-type: none"> • Relationships among the lead agency staff & older residents • Partnerships among professionals • Older adults' relationships with each other • Gaining & utilizing specialized knowledge of the community to provide tailored services 	<p>n/a</p>	<p>Examine whether community-based programs based on the social capital conceptual framework are more effective than those do not.</p>
<p>Cohen-Mansfield, et al., [32]. Predicting service use and intent to use services of older adult residents of two naturally occurring retirement communities. Social Work Research.</p>	<ul style="list-style-type: none"> • Services utilization • Health services • Functioning services • Recreation activities 	<ul style="list-style-type: none"> • 180 participants 	<ul style="list-style-type: none"> • Age is a significant predictor of service use except for recreation. • Female, older age, and living alone were significantly associated with service use. • Lower levels of education predicted higher total use of services. 	<p>n/a</p>	<ul style="list-style-type: none"> • Target services to frail older adults & those in need (older, female, lived alone).
<p>Greenfield, et al., [26]. A tale of two community initiatives for promoting aging in place. The Gerontologist</p>	<ul style="list-style-type: none"> • Services & activity beneficiaries • service delivery processes • funding sources 	<ul style="list-style-type: none"> • 62 NORC programs 	<ul style="list-style-type: none"> • Promoting access to services • Strengthening social relationships & reducing social isolation • NORC programs were more likely to assist with home-delivered and congregate meals. • NORC programs offering more traditional health and paid staff • NORCs relied more on government funding than villages 	<ul style="list-style-type: none"> • Garner major supports from government sources. • NORC programs' greater inclusion of older adults with acute needs suggests difficulties in garnering significant additional financial support from older adults themselves. 	<ul style="list-style-type: none"> • Diversified funding, including government, private donations, and nonprofit organizations are more financially secure.
<p>Greenfield [14]. The longevity of community aging initiative. J of Housing for the Elderly</p>	<ul style="list-style-type: none"> • NORC long-term sustainability 	<ul style="list-style-type: none"> • Semi-structured interviews with staffs of 10 lead organizations 	<p>Three types of sustainability goals:</p> <ul style="list-style-type: none"> • Continuing the program indefinitely within the lead agency (eight organizations) • Integrating the program functions across other organizations • Defining the program as a finite project 	<ul style="list-style-type: none"> • Need additional government funding to support NORC programs. 	<ul style="list-style-type: none"> • Diverse funding sources • Scale back program operations • Inter-organizational Collaborations • Activities with partners from the beginning of implementation • Activities to inform older adults existing services
<p>Bronstein, et al., [33]. A Neighborhood Naturally Occurring Retirement Community. J of Applied Gerontology</p>	<ul style="list-style-type: none"> • Views from providers and residents. 	<ul style="list-style-type: none"> • Qualitative interviews • N=9 (providers, administrators, resident council members) 	<p>Partner Interviews:</p> <ul style="list-style-type: none"> • Community partnership is important. • NORC links residents with service providers with whom they can relate and trust. • Informal networks and independence are important Resident Interviews: • Provide concrete assistance with housing maintenance • NORC programs can support AIP. • Need to develop and support informal systems 	<ul style="list-style-type: none"> • Working as a collaborative was challenging. • Mistrust by older adults is an obstacle in providing services 	<ul style="list-style-type: none"> • Establishing a trusting relationship with the older adult residents & identifying trustworthy service providers • Collaboration is critical in developing and implementing healthy NNORCs • Concrete support is important.

<p>Cohen-Mansfield, et al., [34]. The impact of NORC service program in Maryland. Health promotion international</p>	<ul style="list-style-type: none"> Impact of service organizations on NORCs residents Community Partners (CP) 	<ul style="list-style-type: none"> Experiment: Baseline: 58 follow-up survey: 34 Control: Baseline 70 follow-up survey: 13 	<ul style="list-style-type: none"> Increased satisfaction with recreational activities and social life Significant decreases in depression. Members were more likely to get out of the house, felt less isolated, and were happier since joining CP activities. 	<ul style="list-style-type: none"> The move of Community Partners (CP) to a membership model of services resulted losing participants. 	<ul style="list-style-type: none"> It is necessary to determine whether financial costs for underprivileged should be covered by the government, or if CP services will only be affordable to persons with more financial resources.
<p>Elbert, et al., [34]. Indicators of a successful NORC. J of Housing for the Elderly</p>	<ul style="list-style-type: none"> NORC program evaluation 	<ul style="list-style-type: none"> Case study 2,614 (six years) 	<ul style="list-style-type: none"> Reduce nursing home replacement 78% aware of community resources 62% felt being part of a strong community 52% felt NORC helped them remain in their homes Half felt they made new friends and improved or maintained their health. 	<ul style="list-style-type: none"> Lack of a “gold standard” to evaluate NORC programs 	<ul style="list-style-type: none"> Need program evaluation indicators
<p>Grant-Savela, S. D. [36]. The influence of self-selection on older adults’ active living in a NORC. J Housing for the Elderly</p>	<ul style="list-style-type: none"> Pull factor Active living 	<ul style="list-style-type: none"> Case study 197 participants 	<p>Pull factor:</p> <ul style="list-style-type: none"> Area’s natural beauty & lakes Having vacationed in the area Outdoor recreation 	<ul style="list-style-type: none"> Need further exam how changes in the personal environment (e.g., activity companions and social support) impact active living and social interaction 	<ul style="list-style-type: none"> Meeting the active living needs of older in-migrants may be beneficial to both communities and older residents.
<p>Grant-Savela, S. D. [37]. Active living among older residents of a rural NORC. J Applied Gerontology</p>	<ul style="list-style-type: none"> Active living 	<ul style="list-style-type: none"> Case study 197 participants 	<ul style="list-style-type: none"> Respondents engaged in at least one leisure or household activity Walking was the most prevalent activity. 	<p>NA</p>	<ul style="list-style-type: none"> Need more research focused on older adults living in rural areas.
<p>Carpenter et al., [38]. Anticipating relocation. Jof Gerontological Social Work</p>	<ul style="list-style-type: none"> Social resources Emotional resources 	<ul style="list-style-type: none"> 324 residents 	<ul style="list-style-type: none"> 26% of residents believe they may have to move over the next few years: Mostly among single older woman, living alone. Reasons: declining health & financial constraints; navigating safely around their residence, maintaining their home, and preserving social connections. 	<ul style="list-style-type: none"> Declining health condition Financially insecure Lack of comprehensive support system Services were available but underutilized. 	<ul style="list-style-type: none"> Identifying older adults at risk for relocation Making services available and letting residents know. Client-centered research is needed to understand why services go unused Needed services include: <ul style="list-style-type: none"> Home modification programs Activity and fitness programs Financial counseling Psychological and social support

Table 1B: NORC articles.

Senior Cohousing (n=7)					
	Focused Areas	Sample	Key findings	Challenges	Recommendations
Glass [39]. Sense of community, loneliness, and satisfaction in five elder cohousing neighborhoods. J of Women & Aging	<ul style="list-style-type: none"> Participants demographic Reasons for moving Satisfaction Loneliness and sense of community. 	<ul style="list-style-type: none"> Five elder cohousing neighborhoods 	<ul style="list-style-type: none"> Pull factor - sense of community, town and surroundings, mutual support, liked the cohousing concept Loneliness score falls within “not lonely” category Satisfaction with sense of community was negatively associated with loneliness 	<ul style="list-style-type: none"> Cohousing is still not well understood. Public awareness is just slowly growing Little research has addressed the intersection of cohousing, aging, and gender. 	<ul style="list-style-type: none"> Future research on cohousing decision. Cost-effective ways to provide this type of housing and Community option (e.g. retrofitting).
Glass [16]. Resident-managed elder intentional neighborhoods. J of gerontological social work	<ul style="list-style-type: none"> Social networks Neighborly support Satisfaction with the neighborhood community. 	<ul style="list-style-type: none"> 3 resident-managed intentional neighborhoods (n =59) 	<ul style="list-style-type: none"> Promote social resources & reduced social isolation Participants were at risk of social isolation The most common neighboring behaviors: knowledge sharing, lending/borrowing things Satisfied with the neighborhood community Much of the help needed is not skilled care, but neighboring support. 	<ul style="list-style-type: none"> Residents serve as each other’s safety net; n oser-vice staff stands by. 	<ul style="list-style-type: none"> Social and health professionals could provide consultation, (e.g., consensus building, getting along with difficult people, caring for each other, and plan for later life), assessment, and assistance in connecting with formal services. Special group cohousing should also be considered.
Markle, et al., [40]. Social support in the cohousing model of community. Community development	<ul style="list-style-type: none"> Socially supportive behaviors Perceived social support Motivations choose a cohousing 	<ul style="list-style-type: none"> Interview: 10 cohousing residents Survey: 60 cohousing residents; 65 similar individuals who were interested in cohousing (comparison group). 	<ul style="list-style-type: none"> Cohousing members both gave and received significantly more socially supportive behaviors than their non-cohousing peers. A complex interplay of developmental, societal, and individual factors may inform residents’ experiences living in cohousing. Why cohousing: prior experience of community living, dissatisfaction with nuclear family living models, desire for ecologically sustainable living, etc. 	<ul style="list-style-type: none"> Getting along with a large group of people, especially around issues of shared ownership, social structures, and parenting practices. 	<ul style="list-style-type: none"> In-depth interviews with both cohousing & non-cohousing individuals, on factors impact decisions around conventional vs. cohousing options.
Glass & Vander Plaats [41]. A conceptual model for aging better together intentionally. J of Aging Studies	<ul style="list-style-type: none"> Aging better together intentionally Mutual support Increased acceptance of aging Feelings of safety/less worry/lessening of social isolation 	<ul style="list-style-type: none"> 26 residents 	<p>The majority of respondents agreed:</p> <ul style="list-style-type: none"> “aging can be stressful.” there was more mutual support in cohousing. They are feeling safe/less worry/ lessening of social isolation. 	n/a	<ul style="list-style-type: none"> Future research should investigate whether the model of aging better together intentionally applies to other elder intentional communities.
Glass [42]. Lessons learned from a new elder cohousing community. J of Housing for the Elderly	<ul style="list-style-type: none"> Process of community building Benefits/challenges of living in senior cohousing 	<ul style="list-style-type: none"> Surveys and in-depth interviews. mixed-methods longitudinal evaluation N= 34 	<p>Common Activities:</p> <ul style="list-style-type: none"> Residents’ association and common meals Feelings of safety and comfort 7% respondents would recommend senior cohousing to other people their age 	<p>Lack of shared vision Community structure & organization Mixed opinions regarding choice to have both owners and renters in the same community Varied participation Physical design considerations Declining mutual support Getting along with each other.</p>	<ul style="list-style-type: none"> Attract younger residents to manage some of the physical work and provide mutual support

<p>Kramp, J. L. [43]. Senior cohousing (Doctoral dissertation, Oklahoma State University).</p>	<ul style="list-style-type: none"> • Motivations & expectations • Place attachment • Perceived autonomy 	<ul style="list-style-type: none"> • Interview & focused group • 8 adults 	<ul style="list-style-type: none"> • Motivations: live with others, autonomy, and downsizing. • Expectations: an area for conversation, natural light&view to the outdoors, etc. • Main concerns: home arrangement (open vs close floor plans; extra bathroom, extra bedroom, or both available; downsize, privacy, etc.) • Senior cohousing floor design matters (influence perceptions towards autonomy, connection to the community & other members). 	<p>n/a</p>	<p>n/a</p>
<p>Glass [10]. Aging in a community of mutual support. J of Housing for the Elderly</p>	<ul style="list-style-type: none"> • Mutual support Sense of community 	<ul style="list-style-type: none"> • Case study • longitudinal study • Mixed method • 33 residents 	<ul style="list-style-type: none"> • “Sense of community” and mutual support were main factors • 80% were “very likely” to ask for help. 	<p>n/a</p>	<ul style="list-style-type: none"> • Exam whether the senior cohousing community meets expectations and improving older adults’ quality of life.

Table 1C: Senior cohousing.

UBRC (n=3)					
	Focused Areas	Sample	Key findings	Challenges	Recommendations
<p>Montepare, et al., [44]. Becoming an Age-Friendly University. Gerontology & geriatrics education</p>	<ul style="list-style-type: none"> • Age-Friendly University (AFU) campus 	<ul style="list-style-type: none"> • Case study • n=1 The AFU campus reflects a partnership between Lasell College and Lasell Village 	<ul style="list-style-type: none"> • “Talk of Ages” program provides inter generational exchange to facilitate the reciprocal sharing of expertise between different-aged learners • Mitigate negative age attitudes. • Faculty Fellows build capacity to support greater attention to aging education and extend intergenerational connections across the curriculum. 	<ul style="list-style-type: none"> • Leadership to engage diverse stakeholders • Navigating variation between AFU and UBRCs • Extending the AFU initiative across campus programs • Develop best practices for teaching/learning • Ageism is the biggest challenge • Developing programming that includes older participants with cognitive issues. 	<ul style="list-style-type: none"> • Develop curricular Talk of Ages program • Cross-campus engagement can be expanded by actively engaging residents in campus service clubs and activities • Enhance intergenerational connections
<p>Montepare & Farah [45]. Talk of Ages: intergenerational classroom modules to engage older and younger students across the curriculum. Gerontology & Geriatrics Education</p>	<ul style="list-style-type: none"> • The Talk of Ages intergenerational module program 	<ul style="list-style-type: none"> • Case study • 18 instructors, 20 older students, and 59 younger students 	<ul style="list-style-type: none"> • Instructors, both older and younger students, found the program appealing. • >90% indicated older students had more impact on their learning • Intergenerational exchange can deepen learning and enhance academic skills. 	<ul style="list-style-type: none"> • A semester-long schedule may be inconvenient for many older students. 	<ul style="list-style-type: none"> • Preparing all students in advance about what to expect. • Let older students understand the learning goals • Managing the uneven balance of conversation between younger and older students.

<p>Tsao [17]. New models for future retirement (Doctoral dissertation)</p>	<ul style="list-style-type: none"> • Factors influencing older adults' relocation to UBRCs • Commitments and attitudes 	<ul style="list-style-type: none"> • National survey n=155 	<p>Four major behavior patterns:</p> <ul style="list-style-type: none"> • Learning while aging • Working while aging • Leisure while aging • Intergenerational interactions <p>Why move to UBRC:</p> <ul style="list-style-type: none"> • Live with people sharing a similar background • University resources and keep working on campus • Learning activities & personal growth • Active inter-generational community • Aging in community 	<ul style="list-style-type: none"> • Absence of an enabling policy fostering diversity and an age-friendly environment • Lack of a formal program structure enhancing the integration of the residents into campus life. 	<ul style="list-style-type: none"> • Develop an enabling organizational structure to facilitate a long-term partnership between the university and its linked retirement community
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Table 1D: UBRC

AIC Model	Focused areas	Results	Challenges	Recommendations
<p>Village (n=12)</p>	<ul style="list-style-type: none"> • Service provision& utilization • Funding • Variation of the village model • Member characteristics • Anticipated engagement • Health, Quality of life, well-being • Social/civic engagement • Sustainability challenges • Age-friendly community criteria • Aging in place 	<ul style="list-style-type: none"> • Priority goals: access to services (70%); reduce social isolation (25%) • Most Villages operate autonomously, relying on member fees and donations. • Village members typically are organizers and service providers • Half: aged 65 years or older, White, non-Hispanic, homeowners, and have lower care needs than the elderly U.S. population • Significant variations among villages • Older adults who value disease prevention, have rich resources, and aware of the benefit of joining the village are more willing to join the village. • Near 80% used social/educational events. • Most villages are age-friendly communities • Younger members have higher social and civic engagement • Older members perceived improved care access and mobility. 	<ul style="list-style-type: none"> • Funding • Inter-organizational collaboration • Organizational development • Recruitment • Access to professional services • People who are older than 85 years are less likely to join • Leadership development • Meeting service need as members age 	<ul style="list-style-type: none"> • Increase funding diversity • Build collaboration • Encourage additional volunteer involvement • Explore village sustainability and effectiveness by village types • Examine village leaders' lived experience. • Identify motivation-to-join factors • Ways to recruit new village members • Assess older adults' need& provide tailored services • Evaluate the impact of the village & its long-term sustainability, especially its impact on vulnerable members • Assess village impact on members' health and social function

<p>NORC-SSP (n=13)</p>	<ul style="list-style-type: none"> • Service utilization & satisfaction • Physical and social environment • Factors affecting NORC activity participation • Meaning of social contact • Funding • NORC sustainability • Impact of services • Relocation 	<ul style="list-style-type: none"> • Priority goals: enhancing access to services and reducing social isolation • Pull factors: natural beauty, near the lake, outdoor recreation • About 94% of participants engage in leisure/household activity (i.e. walk) • Low residential turnover in suburban single-family, rural areas. • Factors affecting NORC activity participation: personal social need/health, program, community contexts, other attendees' perception. • Social contact: Replicate existing contacts, community, activity-based friendships • Major funding sources: government (65%) • 60% services offered by professional staff • Most NORC also provide Home-delivered meals (73%) and congregate meals (51%) • Residence thought that NORC foster a sense of community, coordinate different services, provide house maintenance, & support AIP • Residents felt happier and less isolated - very satisfied with recreation (77%), social work services (73%), very satisfied with health services (58%), transportation services (47%) • 26% of residents believe they may have to relocate because of failing health and financial constraints, safety, home maintenance, and social connection. • Female, older age, living alone, education was associated with more service use. • Reduced nursing home placement (2% vs. national 4.5%) • 52% reported NORC helped them remain home, 62% felt sense of community, about 50% made new friends/maintain health 	<ul style="list-style-type: none"> • Some NORC residents may not choose to age in place; but just be stuck in their community. • Difficulty getting financial support from older adults • Develop attractive program and services • Quality of staff • Develop inter-organizational partnerships • Engage volunteers • Declining health, financially insecure, and lack of comprehensive support system are push factors for relocation. • Some services are underused. • Lack of standard for NORC evaluation. 	<ul style="list-style-type: none"> • Meet older adults active living needs • Different NORCs need different strategies based on the physical, social environment, and residents' needs • Find diversified funding support. • Establishing a trusting relationship between older adult and service providers • Inform older adults about existing services. • Client-centered research to understand why some services go underused • Frailer population (older, female, live alone, less educated) are more likely to use services. • Need NORC evaluation indicators
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<p>Senior Cohousing (n=7)</p>	<ul style="list-style-type: none"> • Motivation and expectation towards senior cohousing • Mutual supportive behavior • Sense of community • Place attachment • Perceived autonomy • Community building • Benefits & Challenges • Lonelines 	<ul style="list-style-type: none"> • Move Motivations: sense of community, autonomy, and downsizing. • Expectations: conversation area, natural light, view of outdoors, energy efficiency. • Promote social resources & reduced social isolation • Family(32%) or outside friend(21%) connections were at risk of social isolation • Common neighboring behaviors include knowledge sharing, lending/borrowing things, listening/supporting each other. • Cohousing members both gave and received significantly more socially supportive behaviors than their peers. • barrier-free environment. • Involvement: Residents' association (97%) and common meals (84%). • Loneliness score falls within the "not lonely" category 	<ul style="list-style-type: none"> • The community structure and organization between the board and residents' association. • The physical design (small unit space) • Mixed opinions about choice to have owners and renters in same community • Varying levels of participation • Declining physical and mental health • Declining mutual support • Dynamic changes as new members joined and old members moved out 	<ul style="list-style-type: none"> • Explore factors affecting people's decisions around cohousing options. • Apply the model of aging better together intentionally • Explore whether senior cohousing meet expectations and improving residents' quality of life. • Attract younger residents to manage some of the physical work and provide mutual support • The cohousing design should take place attachment and perceived autonomy as their design objectives
<p>UBRC (n=3)</p>	<ul style="list-style-type: none"> • Intergenerational classroom format • Motivation of moving to UBRC • Impact • Talk of age program 	<ul style="list-style-type: none"> • 90+% of the residents indicated that older students had more impact on their learning and would like to have more experiences. • Intergenerational exchange can deepen learning and enhance academic skills. <p><i>Behavior patterns:</i> Learning while aging, working while aging, leisure while aging, Intergenerational interactions</p> <p><i>Motivations to move to UBRC:</i></p> <ul style="list-style-type: none"> • Live with people sharing similar background • University resource sand work on campus • Learning activities & personal growth • Active inter-generational community • Proximity to places they like • Being independent & self-determination • Religious reason <p><i>Impact:</i></p> <ul style="list-style-type: none"> • Improve personal growth, self-actualization, social integration, valued roles in retirement • Talk of Ages program facilitates the sharing of expertise between different-aged learners and mitigate negative age attitudes. • Programs (Faculty Fellows) build capacity to support greater attention to aging education and extend intergenerational connections across the curriculum. 	<ul style="list-style-type: none"> • Semester-long schedule may be inconvenient for many older students. • Lack of policy and formal program structure enhancing connection between residents & university • Develop best practices for teaching & learning • Navigate relationship between community and host institution, address ageism and seniors' declining cognitive skills • Raise awareness and engagement 	<ul style="list-style-type: none"> • Develop an enabling organizational structure and strong leadership to facilitate the long-term partnership • Build age-friendly intergenerational classroom and enhance intergenerational connections

Table 2: Current literature synthesis: focused areas, key findings, challenges, & recommendations.

could use some diversity in funding sources [27]. Villages also lean on its members for volunteer involvement. With the decrease of members' health and functioning, the consumer-driven natures, villages face challenges providing needed support [15]. Other challenges include leadership development, meeting diverse service needs, lack of inter-organizational collaboration and variations among different villages [23,15].

NORCs mostly operate on government funding. Common challenges in the NORC communities include limited funding sources, lack of partnerships, older adults' involvement, or attractive services [12,14,26,29]. Residents reported needing more intensive healthcare services and culturally appropriate programming for diverse ethnic groups [29]. As residents aging and losing mobility, they may stay in a NORC but withdraw from participation due to their decreased mobility. On the other hand, NORCs also experience unused services [38] and lack of appropriate model to guide program evaluation [35]. Aging adults actually like to participate in more activities and take advantage of services available. However, many do not participate due to declining health that may require more assistance from others or they may live in a suburban site where local gathering places and services are not located close to the residence [28]. Researchers recommended monitoring service needs overtime to better address service gaps [29], tailoring strategies for neighborhoods with different physical and social environment, improving service providers' culture competency, and conducting program evaluation and cost-effective analysis [29,33]. Additional research is also needed to explore the role of government funding as there may be restrictions to the services available [34].

Challenges in senior cohousing include declining health and mutual support among the members due to aging, inconsistent participation levels, difficulty getting along with each other, too expensive and the physical design of the model [40,42]. Future research should explore whether senior cohousing communities meet older adults' expectations and improving their quality of life [10]. Senior cohousing leaders should also consider attracting younger residents to manage some of the physical work and provide mutual support [42].

Some key challenges of UBRCs include no formal policies or program structure to connect the residents with the university, a need for more engagement and awareness of this option [17,41]. The semester-long schedule maybe inconvenient for older adults [41]. Navigating institutions' priorities and coordinating diverse stakeholders among UBRCs and host institutions warrant attentions [40]. Developing best practices for learning such as building age-friendly classrooms and environment, enhancing intergenerational connections, and developing strong leadership are recommended [41].

Discussion

Current review and evidence support the overall positive impact these promising AIC models and programs had on members. Continued research is needed to identify innovative AIC housing and community models to address the diverse and growing aging population globally. The findings show that these AIC models provide services that allow aging in place; however, there are differences by model. Specifically, about 93% of villages offered social and cultural gatherings to foster social connections [25] and village members are more involved in the organizational development [27]. The NORC findings showed that 78% of its members are aware of resources in their community while 62% felt they were part of a strong community

[35]. The members of the cohousing model reported their need for open floor plans, community designs that would increase social connections since these members were 80% more likely to ask others for help [10,43]. In terms of the UBRC members, over 90% of students believed these members impacted their learning experience [45].

Review of these empirical studies showed common financial and sustainability challenges among all AIC models. Both village and NORC have financial unsustainability challenges [12,15,29]. From an affordability perspective, middle-income people who live in the gap between government support and private payment may have difficulty paying the membership fees in the village or join the cohousing community or UBRC. Overall, the membership fees funding model is not sustainable in low to moderate-income communities. The government-funded model may also have sustainable challenges when the government cuts the budget.

Empirical studies pointed out some unique challenges for each AIC model. Data showed most village members were white with middle to higher-income [5,18,48]. Villages face challenges to recruit and meet diverse residents' needs, especially minority older adults. There is also a need to examine participation and creative strategies of member recruiting because members are recruiting from their circle versus creating new social connections [23]. It is necessary to identify factors that shape people's participation and creative ways to recruit new and more diverse village members [18,20,48]. There is also a need to determine the health impact among village members and examine the relationships between the village type and the village leader experience [15]. Almost half of the village services were offered by older member volunteers [26], thus may further face challenges when members get older [21,26,27]. In a consumer-driven village organization, leaders may experience higher demand or more responsibility to provide services, which can become taxing on a volunteer leader who may have their own health needs [15].

Some NORC residents may not choose to age in place; but felt stuck in their community [30], or face relocation risk to institutional care because of declining health, unsecured financial situation, or lack of a comprehensive support system [38]. Program providers should strive to offer attractive services, concrete support and establishing a trusting relationship [29,33].

Some cohousing's main challenges were considered place attachment and perceived autonomy factors in the physical design planning [43], and how to structure and organize the cohousing community to attract younger residents to help manage the physical work and provide mutual support [42]. Research related to the decision of cohousing versus traditional housing options such as living with the nuclear family, and evaluations of the model as it relates to the expectations of the residents are needed [42]. There is also a need to examine the levels of given, received, and perceived social support among cohousing members. For UBRCs, it is important to develop an enabling organizational structure and strong leadership to promote long-term partnership, building age-friendly intergenerational classrooms, enhance intergenerational connections and engage residents in campus clubs [17,44].

Limitation

Overall study sample sizes of AIC empirical studies were moderate to small. Some village and NORC studies had larger samples, which ranged from few hundreds to thousands. However, senior

cohousing and UBRC were mostly below 50 participants, likely due to the challenges of recruiting and collecting primary data from older adults. To gain deeper insights, in addition to quantitative descriptives data, most studies also used qualitative, mixed-methods, or case studies in their research designs. This review is limited on the availability of existing published studies thus maybe susceptible to publication bias. We acknowledged other emerging and innovative models in the practice field, which may have not been researched nor published. These practical adaptations and innovation in the field are also critical to move the AIC research forward and warrant further evaluation and examinations. We also recognize that there are promising AIC models outside the U.S. Sharing lessons learned and conducting cross-cultural or cross-country comparisons are critical to advance existing AIC models and practices to better address challenges in our rapid global aging populations.

Conclusion

Although there is variation within and across AIC models, the current review of published empirical studies show these models have similarities such as access to activities that will increase social connections to reduce social isolation and essentially increase the ability of older adults to age in communities with others on a similar path. Findings overall support the positive impacts these AIC models and programs had among members. This review further identified research gaps, model challenges and recommended strategies for continued research attention. It is critical to update current knowledge to capture emerging research areas and lessons learned for housing and community developers and policymakers to consider for addressing the critical and growing needs of aging in community issues. Future research should focus on evaluating the services provided by these different models on the perceived improvement of health, quality of life, neighborhood social cohesiveness and remain independence at own homes and communities [18]. Our review echoes the observation that most AIC models serve middle- to upper-income older adults [5,7,18,48]. NORC is among the few that serves low- to middle-income older adults [5,48]. Future AIC providers should identify solutions or develop new models to involve low-income older adults aging in the community.

IRB Approval Numbers

This study has been approved as an exempt study by the PI's Institutional Review Board (SBE-17-12893). A cover page with consent information was provided with the paper-survey version and "click-through consent page" for the online survey version, before participants voluntarily agreed to take part of the anonymous survey.

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