Housing Innovations: Business Case to Age in Place

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Bruyère #Droitaucoeur #BeMoved

Champlain Dementia Network

About Bruyère

Bruyère operates as an academic health care organization, expanding over multiple locations and facilities, offering inpatient, outpatient, and community health programs focused on improving quality of life for patients and supporting them stay and return home [1]. Building on its mission statement, Bruyère is "driven by learning, research and innovation, to lead an integrated system of care that maximizes your quality of life and health potential" [1]. Inspired by the values and legacy of Mother Élizabeth Bruyère and committed to providing compassionate and holistic care, Bruyère tests the boundaries of research and innovation – building on partnerships to engage people, community, and those served, with the goal of being recognized as a national leader in the way quality of care is delivered [1].

About the Champlain Dementia Network

Building the case and working alongside Bruyère, the Champlain Dementia Network (CDN) brings together diverse members and stakeholders across the region, creating linkages and collaboration to focus efforts on implementation committed to the CDN vision, principles, and priorities – "a supportive community that empowers people with dementia and their families to live well" [2]. The CDN promotes a shared accountability across its members to ensure collaboration and support on the implementation of specific initiatives for people living with dementia and older adults. Through the planning and outreach, the CDN ensures alignment of emerging issues, opportunities for synergy, and consult on changes and system impacts with researchers, funders, and policymakers at the regional, provincial, and national levels.

Acknowledgements

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Executive Summary

Although the impacts related to Canada's aging population are well known – emphasized pressure on home and community care, economical independent living, improving care and health outcomes, and reducing expenditure – there has been little progress to keep pace with the innovations aimed to safeguard traditional health care institutions and sustain long-term solutions to age in place [3]. With projections of roughly 1 in 4 Canadians over the age of 65 by 2031, current concerns by this age demographic include the cost, quality, and availability of services within the community to support them at home [4]. Although subjected to sustained demand, these proactive services and programs exist but operate in silos, impeding collaboration, crippled by inefficiency, constricting scopes of service and a lack of accountability [5]. The demand for affordable options in housing, health care, and home support are needed. While disparities continue, despite our awareness of their existence, innovative housing initiatives are not only able to maintain the health and well-being of older adults, but also consider the importance of choice – having the flexibility to choose which housing option is best suited to meet their needs. As such, an approach is needed to effectively manage the health of populations while also considering the value of '*where'* when discussing access to care.

Following a survey from the National Institute on Aging (NIA), 96% of respondents 65 years and older advised they would be willing to do "everything they can" to avoid admission into the long-term care system [6]. Innovative housing opportunities for older adults to age in place has significantly increased and are vital to consider moving forward. This raises the question behind the government's rationale for investment in long-term care as opposed to home and community initiatives and alternative living environments. The government's plan, while looking to enable the '*when'* and '*where',* is neglecting to consider the '*how'* – ensuring adequate investment balance in alignment with the desire to age in place, instead guided towards the alternative, undesired, and institutionalized option.

All too often, elements of social services such as housing, income, and community are not considered when looking to improve the population health [7]. An aging population can make a significant difference in the cost of health care [8], with health care demands growing in parallel to the incident rate of chronic, complex conditions [9], and a system ill-prepared to address their needs [10]. There is tremendous opportunity to strengthen links across parts of our health care system and build widely accepted and measurable improvements across sectors [11]. Yet, over-regulated restrictions with rigid funding policies remain the status quo, impeding innovations aimed to address these obstacles. An unattended challenge expected to place tremendous burden and alarming cost consequences on an already strained health care system is the growing number of people affected by dementia [12]. The impact of dementia on Canada's health-care system will be huge. Prevention will be paramount in the way these older adults are provided the appropriate means and resources central to delay or reduce the risk of developing dementia and safely navigate aging in place [12].

In developing the business case to age in place, the undisputed need to collaborate lead to the forming of the Champlain Dementia Network (CDN) working group. Knit together representing the full continuum of organizations within the provisions of health, community, and housing to consider their role in the future development of a sustainable, suitable, and supportive community for older adults, particularly those living with dementia [13]. To better recommend innovative initiatives, the framework used to guide the collection, processing, and strategic analysis require alignment with the CDN working group's main pillars – health, cognitive function, social and community engagement, all within the context of affordability. The report carefully considers both housing and health in the evaluation and prioritization in order to narrow the sample of organizations and innovative initiatives to be interviewed. Conducting the interviews aimed to further enhance the data collection, insights, and emerging themes demonstrating the value and impact made on those served and to offer the knowledge and critical thinking translation around the key issues facing older adults to age in place.

The final report brings to the forefront 14 housing models and initiatives within a matrix used to measure the impact of outcomes across factors for successful implementation and scalable transformation. The recommendations articulate the reasoning for investment in the area of aging in place, leveraging the current and meaningful innovations willing to question the status quo, waiting for our governments, health and social sector, public-private organizations, funders, policymakers, councils, and elected officials to join in this commitment. Enable a collaboration aimed to transfer the way in which systems can support and meet the needs for the current old to age in place. Better yet, enable flexibility within the values that inform our systems to better share, prepare, and adapt to meet the needs of the future old. A growing body of evidence supports the notion and benefits of aging in place so long as those meaningful solutions remain accessible, affordable, and sustainable. Without offering variety and timeliness to the options designed to support aging Canadians, systems beyond the health care sector will experience the ripple effect.

Background

Known as "The 2030 Problem" [15], the estimated growth of the aging Baby Boomers Generation by 2030 – by then 66 to 84 years old – will account for over 9.5 million or 23% of the Canadian population [16], [17], [18]. The remarkable triumphs from the advancements within health care has led to people living longer, but this prolonged life-expectancy has also brought about new challenges and many unanswered questions in areas such as sustained good health, well-being, social engagement, dignity and independence, and adequate housing [19], [20]. The Government of Canada recognized that there were a broad range of factors that contributed to an individual's or population's health, going beyond the traditional notions and identified the main determinants of health across a broad range of person, social, economic, and environmental factors, in addition to the social determinants of health – specific to social and economic indicators, such as income, education, and occupation [21]. Despite this awareness, current solutions aimed at improving population health do not consider the interrelated conditions of these indicators. A challenge expected to place tremendous burden and alarming cost consequences on health care services is the increasing risk of dementia cases among these older adults, currently diagnosed in 8.4% of Canadians and estimated to triple by 2050 [20], [22].

Falling behind on their dementia action plan, the World Health Organization (WHO)'s Director-General Dr. Tedros pleads for urgent action, emphasizing that "dementia robs millions of people of their memories, independence and dignity, but it also robs the rest of us of the people we know and love" [23]. Within their action plan, the WHO defines dementia as "a syndrome, that leads to deterioration in cognitive function beyond what might be expected from the usual consequences of biological ageing, affecting memory, thinking, orientation, comprehension, calculation, learning capacity, language, and judgement" [24]. In 2022, an average of 350 Canadians were diagnosed with dementia and for each of those diagnosed, whether by a friend, family, or other informal caregiver, will receive roughly 26 hours a week in care related to activities of daily living, medical care, companionship, and advocacy [12]. In Ontario on any given day, alternate level of care accounts for half of hospitals' beds and are occupied by older adults living with dementia – waiting until care is available within the community [25]. There is an urgent need to improve the way in which health care services are delivered to better inform our systems on the value of delivery a continuum of care at home and in the community to transform the foundational steppingstones for a sustainable health care future.

In July 2020, research collected from 1,003 Ontario residents aged 55 or older found that 89% of respondents plan to stay in their own home for as long as possible [26]. With the rapid rise of Canada's older cohort, prioritizing investments to improve the quality of care, programs, service delivery, and environmental design, to name a few, will be imperative to meet the current and future demand of older adults' everchanging care complexities and needs [27], [28]. The same holds true for the continuum of adequate housing in alignment with older adults' scaling levels of independence [29]. There have been some strides towards developing innovative housing initiatives and encouragement for future improvements, however the tone remains cautious around funding, resources, and unaccommodating regulations and barriers continue to hinder innovation's potential progression [18], [30]. Be that as it may, innovation is incremental,

not radical, but as resources become increasingly scarce, disparities will continue along the rising demands of services and programs should they remain underfunded, understaffed, and deteriorating as they compete for operational funding [31], [32], [33], [34]. Published in 2019, the Government of Canada's first national strategy on dementia, highlights the importance of developing and funding a strategy for dementia and acknowledging its impact on both health care systems and Canadians today [35]. In the absence of care options, the need for care partners will have a huge ripple effect on Canada's economic productivity as people increasingly leave the workforce to care and support the people living with dementia – whether their spouse, friend, or family member – equivalent to over 690,000 full-time jobs by 2050 [12]. It is about health, not just health care – ensuring first and foremost, the promotion and prevention as well as the treatment of illness.

Research Methodology

In an attempt to define terms, acknowledging the importance for further clarity, circumstances in which terms had no universal definition, efforts are made to remove ambiguity for common understanding. The Conference Board of Canada defined innovation "as the process through which economic and social value is extracted from knowledge through the generation, development, and implementation of ideas to produce new or improved strategies, capabilities, products, services, or processes" [13], [38], [39]. However, the Advisory Panel on Healthcare Innovation offers a definition to better capture innovation within healthcare in which it brings about "value in terms of quality and safety of care, administrative efficiency, the patient experience, and patient outcomes [3]".

Although aging is not synonymous of poor health, increased access to health care services in relation to utilization among older adults for said health care services can be easily observed [36]. The same holds true for dementia, age being the most common risk factor and yet "not a normal part of aging" [37]. To develop a business case, the process must ensure a critical examination of the housing innovations, carefully constructed to examine both the benefits and risks involved and presents the rationale to approve investment in its recommendations that deliver true value. This requires a robust research process as outlined in Figure 1, framing recommendations that are specific and succinct, standing out for stakeholders among their competing priorities, given their support is indispensable. Hence, the development that brought the Champlain Dementia Network (CDN) working group together to consider their role in the

future development of a sustainable, suitable, and supportive community for older adults, particularly those living with dementia [13].

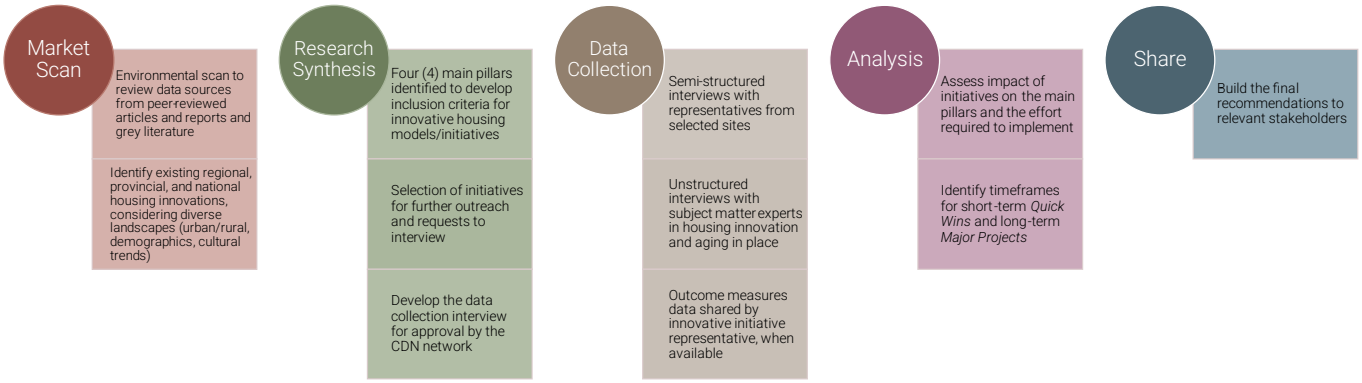


Figure 1. Research Process

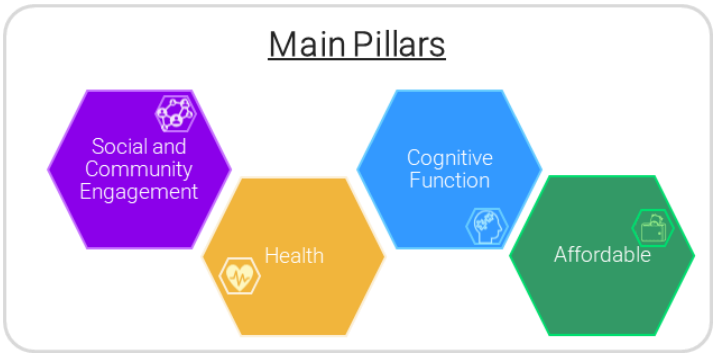
To identify and consolidate relevant knowledge from the existing housing innovations, a market scan approach was conducted through a variety of sources such as, uOttawa Omni of peer-reviewed and grey literature, and explored emerging themes related to housing innovations supporting older adults age in place, with critical emphasis for older adults living with dementia and across diverse landscapes regionally, provincially, and nationally. The research synthesis of key findings presented to the CDN working group led to the identification of the four (4) main pillars focal that hinder the ability to age in place – social and community engagement, health, cognitive function, all within the context of affordability [42]. These pillars created the framework to guide the process of data collection, analysis, and recommendations following successful implementation and the opportunity for scalable integration and transformation [40], [41].

Recognizing the available literature would provide a narrow perspective on the housing innovations, to further enhance our understand of the initiatives and gain additional insights related to the gaps affected, the method of data collection selected would be through scheduled semi-structured interviews, collecting as many as time permitted. An initial sample list of housing innovations was presented to the CDN working group, who condense the sample list size to include 18 innovations. A data collection interview tool was then drafted and later approved by the group in order to proceed with the outreach and scheduling of interviews. Twelve (12) hour-long interviews were completed across ten (10) of the identified innovations and with a subject matter expert at the University of Toronto. Five (5) sites did not respond to the outreach request, and three (3) declined to interview for varying reasons. The interviews focused on information gather related to the background, unique characteristics, and measures or constraints ensuring the affordability and sustainability of the initiative. The interview collection tool consisted of 17 main questions, drawing on themes such as service offerings, community landscape, integrated partnerships, outcome measures, constraints, and cost or funding for resource allocation. The interview tool (see Table 1) is included as an appendix for review.

Analysis

The research suggests that there are a broad range of factors contribute to the health outcomes of older adults. Be that as it may, age-related changes are unique to each person, experiencing

factors both within and out of their control [19]. Interconnected, similar to the determinants of health, the results further strengthen the pillars as chosen by the working group.



Embedded along these pillars, elements such as efficiency, sustainability, and most importantly, high-quality care are demonstrated, a holistic value of the innovative housing initiatives, enabling aging in place. Within the literature reviewed, many documents highlighted the inevitable outcomes of neglecting this national issue – how an older population, rapidly growing, will have a wide range of impacts if left with the status quo, [12], [17], [39], [42]. Several published documents, working in partnership to collaborate and present the strategy plans with sound and thorough data collection results, measuring the positive health outcomes [31], [43], [16]. Yet the policies, investment, and direction continue to favor the long-term care development or construction projects to build more beds, all likely needing a decade to come to fruition [44]. In the paragraphs that follow, the innovations offer a different perspective – capacity – how there is opportunity from the existing builds, homes, and space that are already offering the support to meet the demands of the aging population despite the funding and resources imbalanced, putting the odds stacked against them. Woven together within the analysis section shares both findings from the literature and the insights and experiences from those interviewed to emphasize the rationale for the four (4) main pillars, while also raising to the forefront their profiles as the few among many innovations that have been tried, are imminent and feasible, and most importantly shown proven success, thus selected by the CDN working group for support to changing the status quo.

Social and Community Engagement

With age, social networking tends to decline, driven by spatial and social behaviour changes and becoming less social [54]. In June 2022, the National Institute on Aging released a report identifying over the past year, roughly ¼ of adults 65 years and older had hoped for the opportunity to participate in more social activities [54]. Feeling left out, without companionship, and isolated from others are how 19% of these adults are categorizing their feelings of social isolation and loneliness [54]. This proportion will only intensify alongside the growing older demographic, shrinking social networks, resulting in fewer social interaction, hindering health outcomes. If unaddressed, social isolation and loneliness among older adults increases their likelihood by 50% of developing dementia [55]. Intergenerational programs and living arrangements are measures proved to lessen the feelings of loneliness and isolation [54].

A study showed that older adults with social ties, whether living with someone or having a close group of friends, were more likely to demonstrate meaningful engagement in behaviours connected to health promotion and prevention than those with fewer social ties [56]. When co-

developing the WHO Framework for Meaningful Engagement of People Living with Noncommunicable disease (NCDs) and Mental Health conditions, meaningful engagement is defined as the "respectful, dignified and equitable process of integrating individuals with lived experience across a range of processes and activities, transferring power to people, valuing lived experience as a form of expertise and applying this to improve health outcomes" [57]. These along the important component where older adults are actively participating within their communities and ensuring inclusion in the decision-making process.

Communities that take an active role in the prevention and promotion, building agency and choice in the experience of care, while also offering a living environment within your existing home. These communities strive to connect the affordable and appropriate housing options, while raising awareness of the demographic density to spark efficiencies in the delivery of support services and programming. A growing example of these are Naturally Occurring Retirement Community (NORC) Supportive Service Programs [58], a prominent community-based model promoting aging in place where older adults are active participants in the decision-making. A NORC is defined as a "housing development that is not planned or designed for older people, but which over time come to house largely older people" [59]. Working collaboratively, they create opportunities for older adults to remain active, involved, and target mitigating the impacts of social isolation and loneliness [49]. The Oasis Senior Supportive Living Inc. was among the first to develop this innovation solution to support aging in place and offer programs based on the needs of its members [60]. In a study conducted to evaluate Oasis compared to a neighbouring building with similar demographics, the results demonstrate remarkable outcomes with members rarely feeling a sense of isolation, participating in activities daily, and have been key to managing chronic conditions at home [49]. Although more structured in its build, Abbeyfield Canada offers affordable and supportive options for older adults who are living independently but are lonely and seeking companionship and practical support. Tenants all living in their own private units, share common spaces and always get together for two meals a deal in a family dining setting.

Resembling certain elements of NORCs, where residents are integral to the design and development of the community, cohousing offers a multigenerational collaborative housing community, social connections are both planned and spontaneous as many communities share amenities, still all varying in size and landscape as no one is the same. This allows the community members to thrive through mutual support – bringing purpose and being seen as a valued member of the community –, providing housing that better aligns financially – through shared resources –, socially, environmentally affordable and sustainable – as many are green-built and designed with a pedestrian orientation [53]. Looking to feed two birds with one seed, in identifying two demographic cohorts, homesharing programs create an arrangement offering mutually beneficial aspects, originally developed to connect older adults living alone, who have extra space in their home, with people who need affordable housing. Much like traditional roommates, each with their own room but sharing their common spaces, this concept of homesharing includes a formal agreement – helping the older adult with maintenance support

and companionship with someone needing affordable housing in areas that might otherwise be financially out of reach [59]. Canada HomeShare™, an intergenerational homesharing program was first piloted in 2019 through the City of Toronto, enabling meaningful engagement, contributing to reducing the stigma, and offering older adults the ability to remain in their homes, receive companionship and maintenance support, but most importantly building self-confidence, as they each bring a set of skills, learning from each others' perspectives and experiences. Canada HomeShare™ provides both older and younger adult generations the opportunity to live together in exchange for an affordable place to live and reduced rent and safe supportive services [61].

HEALTH

While health and healthy aging comprises of "optimizing opportunities for physical, social, and mental health to enable seniors to take an active part in society and to enjoy independence and quality of life" [36], this pillar will only focus on the physical and mental health elements as the social component was discussed above. Still, building on social and a main driver behind isolation and loneliness among older adults is in part due to their reduced physical and mobile health [54].

The importance of health promotion and prevention improve the likelihood of maintaining positive health outcomes as you age. By implementing strategies such as being physically active are imperative, but without the activities and programming through community support services to enable these healthy behaviours, with limited mobility and frailty, this can be met with a number of different challenges. One program going beyond the exercise class and tenant population is the Minds in Motion® (MiM) program launched in 2014 by the Alzheimer Society of Ontario [63]. Offered over an 8-week period, with exercise targeting cardio, strength, flexibility, and balance, in addition to and cognitive stimulation all within a social community setting, allowing for games, creative activities, gratitude and expressions of strengths and self-care. The increase in confidence, comfort, and mutual support from others with similar experiences translated to improved physical function and improved quality of care as a result of program training and materials supporting the evidence-based program [63]. The success of the program has allowed for additional funding but continues to advocate for additional supports to further expand the program and its reach.

As the numerous studies and ongoing research continue to reiterate, the benefits of increased physical exercise promoting strength, mobility, and flexibility, weaving in social engagement are immeasurable to promoting healthy aging [62]. Hence their inclusion and core element to the programming among the various independent senior living homes such as Yee Hong, Empress Kanata, Perley Health Senior Living, Bruyère Village, and Fairfields promoting meaningful engagement in preventative activities within the shared spaces, accessible to their tenants.

Two innovations that recognized the need for housing with the integration of community support programs include the J.W. MacIntosh Community Support Services and Ottawa West Community Support Aging in Place (AIP) program. J.W MacIntosh Community Support Services, first established the Park Drive Villa, a rural housing and community support program, offering

affordable apartment units for seniors, expanding to support the needs of the whole community, adding a senior support service center to provide vital health services, ensuring its affordability for seniors with modest incomes. Whereas the AIP program, starting as a pilot project in 2007, working in collaboration with the Champlain Community Care Access Centre and Ottawa Community Housing to provide target services in select subsidized seniors apartments, recognizing the rise in emergency room visits and hospitalizations for the older adults [56]. Following the pilot, the AIP program continued to expand, becoming permanent, offering services to eleven (11) Ottawa Community Housing apartment buildings, ensuring health care is accessible and bridging barriers to supports needed to remain independent and able to age in place.

One innovation that considered the impact on mental health and took to empowering people living with dementia by challenging the stigma and building the understanding of its community to foster a more inclusive community was the Hamilton Haldimand Project through the Hamilton Council on Aging. Working in both Hamilton and Haldimand to develop and implement an age friendly plan, engaging over 300 people across both regions to collect experiences, barriers, and ways to make the community more accessible. Focused on empowerment, building various initiatives surrounding their communities to address areas of importance, leading action teams within the communities through promising practices and approaches.

COGNITIVE

Growing alongside the aging population comes the decline in age-related cognitive function, still without the ability to pinpoint specific preventions or interventions to prevent or reverse its eventual occurrence [57]. Studies report that physical activity and cognitive function work in parallel to reduce the progression of cognitive decline [62]. This can also affect one's ability to adapt to environments, anticipate instability, and ultimately result in falls [50]. There continues to be a high risk of frailty among older adults which strongly correlates to negative health outcomes such as fall-related injuries, disability, hospitalization, and is linked to a higher expenditure of health care resources. Currently, the Canadian Frailty Network estimates 1.6 million adults aged 65 and older living with frailty [43]. Offering sustainable innovations focused on strategies to promote independence, safety, and quality of life include programs such as the Dementia Society of Ottawa and Renfrew County's' ADAPT Your Home Program. ADAPT, while fitting in its context, an acronym that stands for Alzheimer's and Dementia Aging in Place through Technology. While technology, specifically Age-Tech, is not a main focus within the building of the business case, the advancements of technology must be acknowledged in their contributions to wearables to mitigate fall prevention, sensors for wayfinding, home monitoring systems all offer engagements for older adults' and enable aging in place.

As mentioned previously, programs such as Minds in Motion® (MiM) integrate cognitive stimulation within their activities, promoting cognitive stimulation for those with early symptoms of dementia to build new friendships in a relaxed atmosphere with others living similar experiences. Another program offered through the Dementia Society of Ottawa and Renfrew

County is the Lending Library. Similar to traditional libraries, providing access to various products, resources, and information to promote cognitive stimulation through activities, companion animals, and age-tech products loaned to individuals at no cost [70].

Among the above-mentioned innovations, many offer areas with green spaces, allowing engagement in activities such as gardening. This multi-sensory connection to nature with its vibrant smells and colors trigger the different senses closely linked with memory and were associated with faster thinking, better attention, and higher overall cognitive function [61].

AFFORDABLE

The COVID-19 pandemic shown a spotlight on the longstanding inattentive 'back burner' challenges of care coordination within our health [44]. As older adults are living longer, their clinical care becomes more complex, chronic disease increases, and the management of their multiple health problems become an important and ongoing concern affecting their quality of life as they strive to age in place [45], [9]. In 2016, it was estimated that chronic diseases cost Canadians $68 billion in direct healthcare and $122 billion in productivity losses [46]. Complex care demands a flexible and responsive health care system, bringing care to the patient in a place of their convenience, pressing care providers into an interconnected setting. These also equate to findings means of efficiencies that both improve quality and appropriateness of care while also saving money that can be better applied elsewhere.

For health care providers, older adults, and their care team to collaborate and share the care planning, the information requires a safe and accessible information system promoting integrated care. An approach where older adults are active partners rather than passive recipients alongside efforts to incorporate concepts of health promotion and prevention with an interdisciplinary team, one that includes both health professionals and non-professionals. Broadly defined, integrated care is characterized by focusing on meeting the community health needs, coordinates care across the continuum, links information systems, enables improved quality care, and works collaboratively [47]. Building partnerships across service disciplines and optimizing system resources will allow each health professionals role – whether doctors, nurses, social workers, occupational therapists, counsellors, physiotherapists, pharmacists, or other specialty areas – to progress towards delivering evidence-informed, consistent, and appropriate care [48]. "A comprehensive assessment, follow it up with a full-range plan of treatment, collaborating to create and promote health initiatives for diverse communities and to provide education to instill disease-prevention behaviors" [45] – that is integrated care.

Research suggest that outcomes lead to "increased performance in daily life, promote fewer falls, shorten hospital stay, and reduce hospital readmission" [49], consequences associated with significant financial costs [50]. The home and community care services play a vital role in an integrated health care system and is essential to effective strategies to support aging in place [51]. Everyone has differing needs and preferences when it comes to housing, and this is especially true where supports are required to help maintain their independence. Aging in place offers older adults the choice – whether it be the location, access to services and amenities, social

connections, or feeling safe and secure in the community [52]. The services offered by home care range, from prevention through health promotion, rehabilitation, maintenance, social adaptation and integration, and support for family caregivers [51]. It is "about adjusting the care to fit the population and not just the population but the individuals…the conditions of work are the conditions of care" [53]. In providing care through collaboration and provider partnership, quality of care flows along a coordinated continuum of care, allowing the delivery of effective care by the system most effectively equipped rather than the traditional one.

PHYSICAL ENVIRONMENT

Although not one of the main pillars, it is known that effective design of care homes' physical environment and its infrastructure and care practices are integral to the experience and needs of older adults [64]. This is further exacerbated with those living with dementia and as such, requires increased support to ensure their surroundings strive to enhance quality of life [65]. There have been recent model designs that show positive correlation between the reduction of negative behaviors and improving both the emotional and cognitive functioning, social interaction, autonomy, and community participation of people living with dementia [65].

While home improvements such as wide doorways, ramps, remodeling the bathroom and kitchen to install a walk-in shower, raised toilet, safety bars, or slip-resistance flooring are remarkable ways in which homes can better support aging in place [66], not all older adults own the home they live in, nor do they have the ability to pay out-of-pocket for these home modifications [67]. An enabler focusing on the improvement older adults functioning and independence to age in place is the use of assistive technology. Innovative technologies supporting aging adults are the range of supportive smart home technologies such as the SAM^3 or Tochtech Technologies allow adults living with dementia equip their home with sensors to reduce nocturnal wandering [68], [69].

Limitations

Ensuring these healthcare services are accessible, affordable, and effective is essential. The challenge is gauging the true value of policies, programs, and interventions based on the quality, relevancy, and adoption by providers, policy makers, funding agencies, and governments [71].

As aging in place becomes the favorable option for older adults, shifting services into the community and at home, these programs have seen rising costs and restricted overall duration and provisions of services [72]. Older Canadians need to be able to access high-quality, well-funded programs and supports to help them achieve and maintain physical health to reduce the risk of falls and achieve overall health promotion and prevention, promote mental health to reduce social isolation, and cognitive health. Quality health care for the aging population being delivered on a continuum from community based, to in-home, to long-term care and palliative care promote the ability for them to remain at home, out of emergency departments, hospitals, and long term care unless needed, and creating a seamless transition from one level of care to another [36].

Becoming more efficient and reducing waste starts with the access to data – constantly navigating and searching across different systems presents many problems and should be prioritize for both providers seeking to offer integrated care and for older adults [73]. Although the heath care sector is becoming more efficient, the above-mentioned innovations – if implemented in silos – will continue to result in isolated benefits, unable to sustain. Yet, the ease of is hindered by systems designed in isolation from one another. This is further amplified with the lack of information sharing as individuals move through the different levels of care, unliked to each other, causing further fragmentation of care [74].

Findings: Sustaining Opportunities to Age in Place

Without meaningful engagement from our communities, the way in which investments are made, policies are written, and service is delivered will not align with the demands of those in which they intended to serve. This problematic pattern and method to approaching health care is not reflective of high quality, efficient use of resources, nor is it demonstrative of value added. The need for innovation in the way existing resources are utilized to promote prevention are paramount.

An important skill required within health care is learning to prioritize. As such, the Housing Innovations: Impact/Effort Matrix illustrated in Figure 2 below, indicates each innovation initiative plotted based on the outcomes on health and how the consideration for housing is in alignment with the four main pillars – health, cognitive function, social and community engagement, all within the context of affordability.

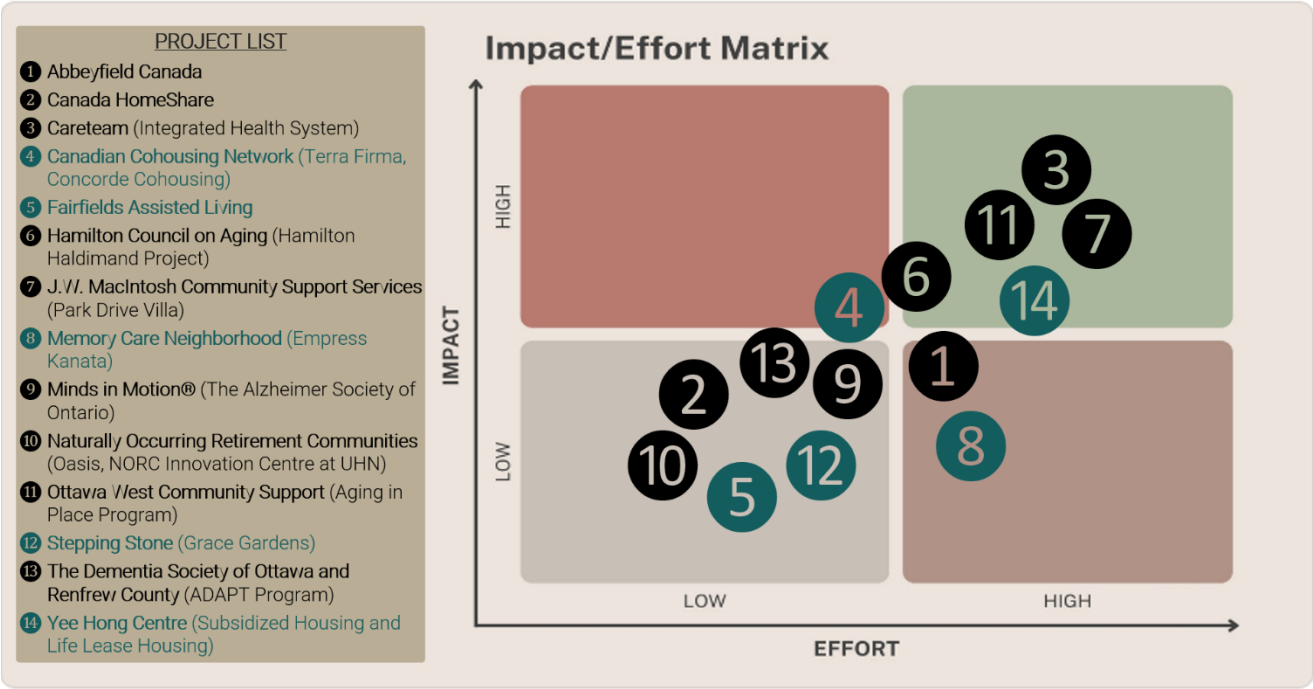


Figure 2. Housing Innovations: Impact/Effort Matrix

The innovations identified using the color black were among those who responded and accepted to interview whereas those identified using the color blue were sent an outreach request to interview but either declined or were unresponsive. Some innovations were grouped together as they offer similar styles of initiatives, such as NORCs and Cohousing sites.

As we strive towards an integrated health care system that delivers coordinated care over time, it is important to remember that health care is often not prepared ahead of time. This makes it very important that systems be designed to adapt and shift through continuous learning in order to achieve the best outcome for population health. This will be most impactful to those living with one or more chronic diseases and want to avoid the complications that quite often result from them. The prevention of such long - term complications is a major challenge facing our health care system. These complications usually result in diminished quality of life and enormous cost escalation that must not be considered in hopes to prevent them. If not, the costs will rise in parallel to Canada's aging population [77].

An emerging theme from the interviews, raised the need for coordinated resources in order for the initiatives to succeed. This element of coordination allows for supports such as check ins, care services, system navigation, government funding, home assessments, education, guidance, conflict resolution, and arrange for transportation or programming. This element of coordination also provides a point person to be available and to build trust and relationships within the community. The ability to sustain this resource allocation is crucial to the ongoing success and growth of the innovation.

Lessons Learned: Reflection

There are several distinct differences between the housing innovations. As such, a major barrier to sustainability is their ability to receive appropriate resource allocation despite their ability to identify or define their type of zoning in order to quality for applicable funding. As shown in Figure 3 below, funding should be allocated based on the ability to demonstrate the value added in part due to their unique and innovative approach, not despite it.

Figure 3. Housing Innovation Continuum

It is also important to note that of these, if not any, very few consider themselves a health care organization or institution, even though health and wellbeing are among their top priorities. Rather, these innovations consider themselves an alternative, a network of bridges between the gaps to support and increase access for our aging population – responding to the demand that has needed a long overdue answer. Be that as it may, do not mistaken these as alternatives to

alleviate necessary programs such as home and community care. Instead, recognize both are critical to reduce the need for public services, aiming to alleviate the unnecessary visits to places such as the emergency department.

This report is not only to prompt dialogue but to shed light on the reactive, 'band-aid' solutions, put in place as a response to the numerous compliance concerns, atrocities, and countless tragedies brought to light by COVID-19 [75]. Experience shows that a temporary solution to a problem does not address the underlying issue and waiting to rip off the band-aid.

Appendices

Table 1. Data Collection - Interview Tool

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DATA COLLECTION – INTERVIEW TOOL

OVERVIEW

In July 2020, research collected from 1,003 Ontario residents aged 55 or older found that 89% of respondents plan to stay in their own home for as long as possible [1]. The remarkable triumphs from the advancements within health care has led to people living longer, but this prolonged life-expectancy has also brought about new challenges and many unanswered questions in areas such as sustained good health, well-being, social engagement, dignity and independence, and adequate housing [2], [3].

A challenge expected to place tremendous burden and alarming cost consequences on health care services is the increasing risk of dementia cases among these older adults, currently diagnosed in 8.4% of Canadians and estimated to triple by 2050 [3], [4]. With the rapid rise of Canada's older cohort, prioritizing investments to revitalize and improve the quality of care, programs, service delivery, and environmental design, to name a few, will be imperative to meet the current and future demand of older adults' everchanging care complexities and needs [5], [6]. The same holds true for the continuum of adequate housing in alignment with older adults' scaling levels of independence [7].

Throughout this interview, responses will offer insights and emerging themes to better understand meaningful aspects for older adults and their caregivers in their community, current innovative efforts that are well supported and those in need of improvement to better target the population served. Discussion will also address the offerings, their gaps, and areas that might not yet be on the radar that should be brought into play for further emphasis moving forward.

DATA COLLECTION – QUESTIONS	RESPONSE
BACKGROUND (SOME MAY BE COMPLETED IN ADVANCE)	
CAN YOU SHARE WITH ME A LITTLE OVERVIEW OF THE PROGRAM/INNOVATION?	**Collection focused on unique/innovative features**
How many are supported by/use this program?	
Where are the various program sites located?	
Services/Supports provided to its population.	
Unique Demographics – who is the population that this program supports? (i.e., gender, language, socio-economic, etc.)	
DOES THIS PROGRAM COME AT A COST AND IF SO, DOES IT CONSIDER THE DIFFERING INCOME LEVELS FOR ADJUSTED USING SOME FORM OF SLIDING SCALE STRUCTURE?	
ARE THERE ELIGIBILITY REQUIREMENTS TO TAKE PART IN THIS PROGRAM/INNOVATION?	
WHAT DOES THE SURROUNDING COMMUNITY LOOK LIKE?	
Role of the staff/volunteers who support the program?	
WHAT WERE THE CATALYSTS THAT SUPPORTED YOUR IMPLEMENTATION? WERE THERE SPECIFIC PRESSURES/OPPORTUNITIES TO CAPITALIZE ON?	
CHARACTERISTICS	
WHAT ARE ESSENTIAL INTERNAL/IN HOME ELEMENTS TO SUPPORT AGING AT HOME/AGING IN PLACE?	Notes:

***if not yet collected: WHAT ACTIVITIES ARE OFFERED TO THOSE YOU SUPPORT?**	
Has there been consideration to expand on the services delivered and if so, which ones would be top of mind?	
ONTARIO DOES NOT HAVE AN INTEGRATED HEALTH INFORMATION SYSTEM. DOES THIS IMPACT THE PROGRAM DELIVERY/MEASURE OUTCOMES (if any)?	
Given the experience in connecting people to care, are there service pressures you are seeing for your older adults?	
WHAT KIND OF SUPPORTS FOR HOME AND COMMUNITY CARE WOULD YOU LIKE TO SEE TO IMPROVE THE GROWTH OF YOUR PROGRAMS IN THE AREA?	

SUSTAINABLE AND AFFORDABLE

WHO, IF ANY, ARE THE KEY PARTNERS THAT SUPPORT THE PROGRAM'S SUSTAINABILITY?	Notes:
DO YOU OFFER ANY SUPPORT RELATED TO THE AVAILABLE FUNDING PROGRAMS, TAX CREDITS, OR GRANTS FOR OLDER ADULTS WANTING TO AGE IN PLACE? (i.e., home modifications, specialty services, devices/technologies, etc.)	
AS PROGRAMS SUCH AS THIS BECOME INCREASINGLY IN DEMAND, ARE THERE PLANS TO EXPAND?	
Are there any constraints that might arise to ensure ongoing sustainability?	
More specifically, are there any cost constraints?	
HOW DO YOU MEASURE/WHAT ARE THE STANDARDS FOR THIS PROGRAM'S SUCCESS?	
To ensure ongoing success, sustainability is important. How are you using these to ensure ongoing funding (through ROA) or operational ROI?	
If not already, has there been any consideration to measure the success against key indicators in other healthcare systems? (i.e., Emergency diversion, reduced ALC length of stays, etc.)	
CAN YOU SHARE ANY PROACTIVE RISK MANAGEMENT PRACTICES DEVELOPED TO ENSURE SAFETY, QUALITY, AND ACCESS TO APPROPRIATE SERVICES/RESOURCES?	
WHAT ARE SOME OF THE WAYS IN WHICH THE PRIVATE SECTORS CAN ENGAGE IN AND SUPPORT THE DEVELOPMENT OF HOUSING INNOVATIONS TO PROMOTE AGING AT IN PLACE?	
Who do you believe can have a pivotal role in this initiative that might be untapped/underutilized?	
HAS THERE BEEN ANYTHING ELSE YOU'VE SEEN IN THE LANDSCAPE FOR HOUSING INNOVATIONS FOR OLDER ADULTS THAT SUPPORT AGING AT HOME/AGING IN PLACE THAT WOULD BE WORTHWHILE PROFILING?	
Have there been any gaps to any of these particular approaches?	

OTHER/CLOSING QUESTIONS

IS THERE ANYTHING ELSE WE DIDN'T HAVE A CHANCE TO DISCUSS THAT YOU WOULD LIKE TO SHARE WITH US?	Notes:

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