HASTINGS PRINCE EDWARD
Public Health

Promoting Physical Activity Among Community Dwelling Older Adults in Rural Hastings & Prince Edward Counties

Situational Assessment

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Abstract

Purpose: Regular physical activity (PA) is associated with many health benefits that help mitigate and manage the physiological effects of aging. Older adults (aged 65+) living in rural Hastings and Prince Edward Counties (rHPE) have fewer personal and community resources to support physical activity as compared to those living in larger urban areas, and therefore, may experience greater challenges in maintaining an active lifestyle as they age. To address this need, a situational assessment was conducted to better understand the determinants that affect older adult PA in rHPE, and to identify evidence-informed population health promotion approaches for working with stakeholders to increase PA in this population. To achieve this, three research questions were proposed:

1. What are the determinants that influence PA among older adults in rural communities?
2. What are effective population level interventions for increasing PA among older adults in rural communities?
3. What is the status of the interventions and determinants that influence older adult PA in rHPE?

Methods: A rapid review was completed to investigate the first two questions using the methodology established by the National Collaborating Centre for Methods and Tools.[1] The results of this review served as a basis for key informant interviews with community stakeholders that collected local perspectives on the determinants of PA and the existing interventions for older adults in rHPE. Purposeful sampling was used to identify key informants involved in the delivery of programs and services for older adults in rHPE. Seven agencies were invited and agreed to participate in this study. Interview transcripts were entered in a Microsoft Excel Spreadsheet, coded, and analyzed using thematic analysis.

Results: The results identified the evidence-based opportunities available for older adult PA in rHPE, such as structured exercise programs, walking programs, and unstructured activities, including gardening, and walking for transportation and leisure. The determinants of PA among older adults in rHPE that were identified are aligned with the published research and include:

- Past individual experiences with PA and personal health status as individual-level determinants that affect motivation to engage in PA
- Living on a low-income and social support networks as determinants within the social environment that shape capacities to participate in PA
- Public transportation, recreation facilities, active transportation infrastructure, and accessibility as determinants within the built environment that affect access and availability of opportunities for PA
- Factors that influence the capacity of community organizations and municipalities to provide opportunities for PA, which included the availability of trained staff, facilities, and communication with older adult populations

In addition, effective population health promotion approaches to modifying the identified determinants of older adult PA in rHPE were identified, including knowledge exchange and advocacy, community engagement, and public education.

Recommendations:

Three key recommendations for public health programs are provided as a result of this SA, as follows:

- Build collaborative partnerships between municipalities, older adult support agencies, community health agencies, and other community stakeholders to prioritize issues and address the determinants that affect the health of older adults in rHPE.
- Consult with older adult support agencies and municipalities to determine their research and surveillance needs for older adult populations and provide timely knowledge exchange activities to support the development of policies and programs that support rural older adult health.
- Work with older adult community stakeholders to develop effective communication channels for older adults in rHPE.

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1. INTRODUCTION

Regular physical activity (PA) is associated with many health benefits that help mitigate and manage the physiological effects of aging, as it is a risk factor linked with chronic disease, injuries related to falls, and mental health. There is moderate to strong epidemiological evidence that PA is a critical modifiable risk factor associated with reduced all-cause mortality, incidence of coronary heart disease, stroke, colon and breast cancer, high blood pressure, and risk of falls and fractures.[2] PA is also associated with improved functional status related to both cognitive and physical abilities and improved psychological and social well-being among older adults.[2,3] Therefore, ensuring that people meet the recommended levels of PA as they age is critical to ensuring that our aging population remains healthy, independent, and active in their communities.

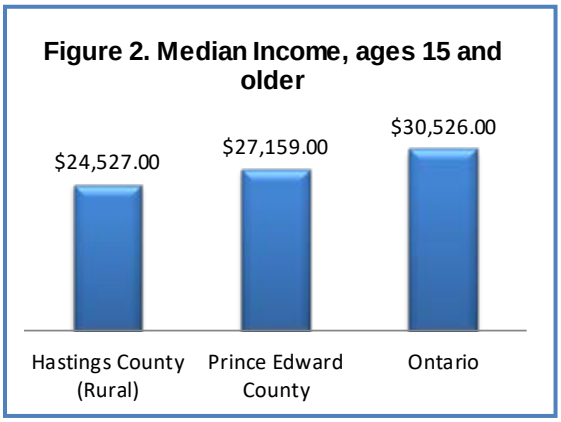
Figure 1. Municipal region population estimates for age 65+

Subregion	65+ % of 65+ pop that live in region
Belleville	30.2
Central Hastings	13.9
Deseronto & Tyendinaga	3.2
North Hastings	9.0
Prince Edward County	20.4
Quinte West	23.2

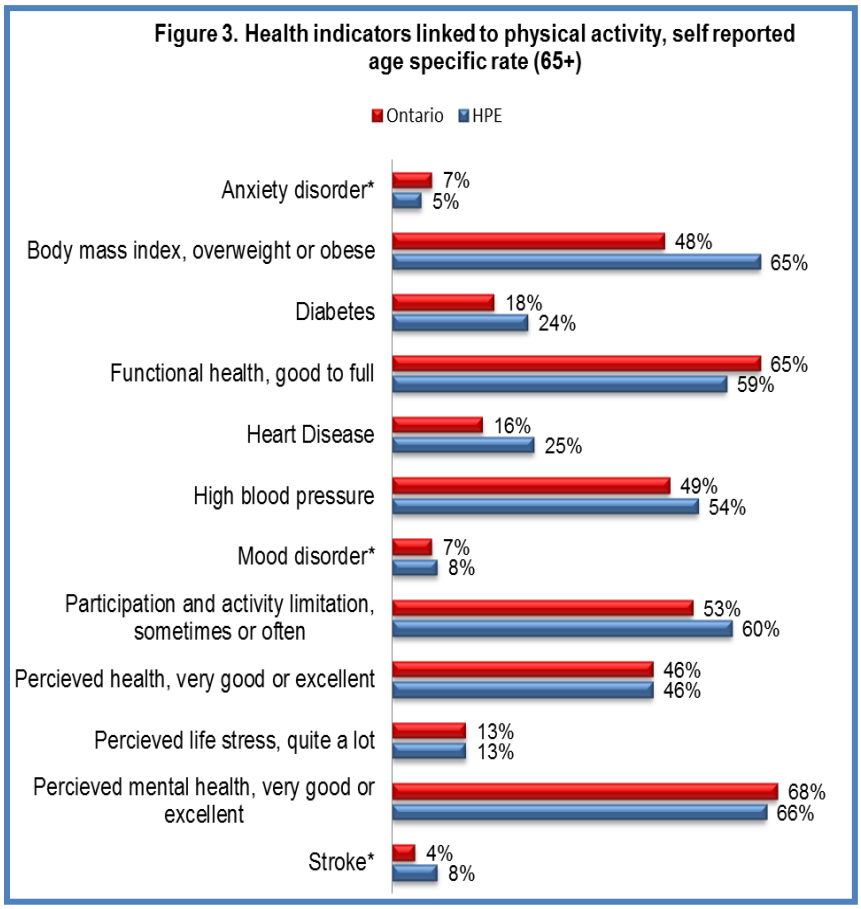
In an analysis of the aging population in Ontario, the Trillium Foundation identified that older adults (aged 65+) living in rural and remote areas experience increased challenges when it comes to meeting their needs and maintaining their quality of life.[4] In Hastings and Prince Edward Counties (HPE), 22.4% of the population is over the age of 65, and 46.5% of the older adults in HPE live in rural communities (Figure 1).[5] With median incomes lower than Ontario (Figure 2), fewer young working adults, and the resulting low tax base, communities in rHPE are correspondingly fiscally challenged to meet the health and social needs of older adults.

While reliable data regarding disparities in health outcomes and health behaviour between the rural and urban areas of HPE is unavailable, it is known that rural populations over the age of 12 are slightly more active than their urban counterparts in Ontario.[6] However, there are indicators that signal this may not be the case for older adults in rHPE. The Canadian Institute for Health Information reports that Canadian adults living in rural areas have higher rates of all-cause mortality, increased risk of circulatory disease, and are more likely to be inactive.[7] The age standardized mortality

rate from avoidable causes in HPE is 251 per 100,000 population, which is significantly higher than the rest of Ontario at 194 deaths per 100,000 population.[6,8]



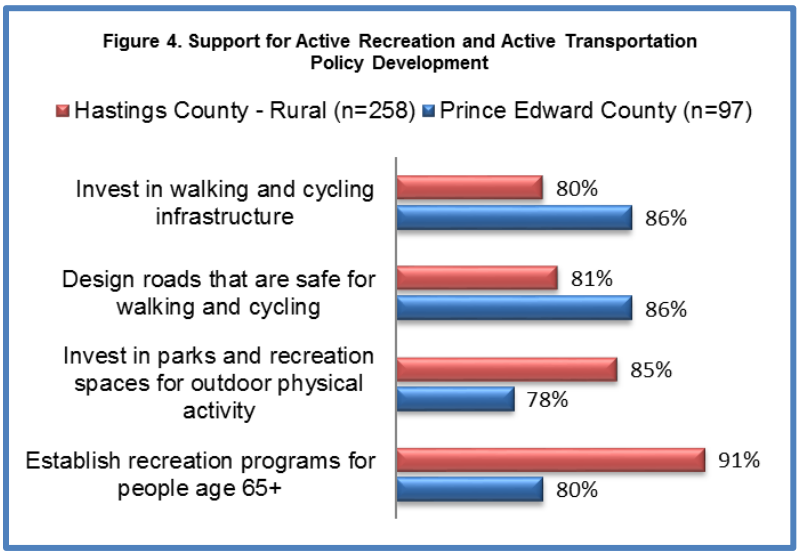
The prevalence of chronic conditions is also higher among older adults in HPE. Circulatory disease, diabetes, and mental health conditions are all greater in HPE than in Ontario as a whole (Figure 3).[6,9] HPE also has higher age standardized rates of emergency department visits for falls, and hospitalization for stroke, than Ontario. [6]



In a qualitative Canadian study, the Federal/Provincial/Territorial Ministers Responsible for Seniors identified the key determinants of healthy aging in rural and remote communities.[10] This study identifies the features of rural physical and social environments that are important to the physical well-being, quality of life, social

interaction, and independence of older community-dwelling adults. Notable determinants include walkable community design with accessible amenities and well-maintained sidewalks, pathways, and trails; transportation options that facilitate mobility and participation in community and recreational activities; and opportunities to be active and involved in the community. Similar features may also be important factors for older adults in rHPE.

Although rates of PA in HPE are comparable to provincial rates,[6] older adults living in the rural areas of HPE are at a greater risk for physical inactivity than those living in urban areas. The percentage of Ontario residents (age 12+) who are active increases along with increasing income.[6] With average incomes in rHPE being 15-20% lower than Ontario, residents of rHPE are less likely to have the financial resources to support regular PA. Further, the availability of affordable opportunities for PA among older adults may vary between the urban and rHPE. The small urban communities of Belleville and Quinte West offer a variety of community facilities and programs that encourage older adults to be physically active. The YMCA of Central East Ontario, the Quinte Sports and Wellness Centre, in addition to privately operated fitness centres, provide opportunities for leisure-time PA, and the comparatively walkable, bicycle and transit supportive urban settings offer opportunities for both active transportation and leisure-time PA. Older adults in the rHPE may not have access to these amenities, and thus could face inequities in access to opportunities for PA.



In 2014, the Healthy Communities Partnership of HPE conducted a Situational Assessment on Healthy Eating and Active Living in order to determine community readiness for associated policy development.[11] In a sample of residents who were predominantly over the age of 50, the study found a high level of support for municipal policies that improve opportunities for active recreation and transportation (Figure 4.), signalling potential community needs in rHPE. However, there remains a requirement for Hastings Prince Edward Public Health (HPEPH) to develop an evidence-base of effective interventions to increase PA among older adults living in rural settings, and as

an extension, understand the local context that shapes the personal, social, and physical environmental determinants that enable and constrain PA behaviour.

There is an absence of specific population health indicators related to PA for rural older adults in HPE, yet there are assumptions that indicate inequities in the opportunities and challenges rural older adults face in maintaining and increasing PA behaviour. Although there are regional indicators that suggest the need for effective PA interventions in this population, there is limited evidence available on the local determinants of PA in rHPE. As a result, the purpose of this assessment is to better understand both the scientific evidence and the local context that shape the personal, social, and physical environmental determinants that enable and constrain PA behaviour so that effective interventions can be developed to increase PA among older adults living in HPE's rural settings.

Social-ecological theories suggest that health behaviours, such as PA, are influenced by interactions between individual characteristics, interpersonal relationships, and organizational, community, and public policy factors. [12] This approach emphasizes the need to understand and address variables at multiple levels of influence in order to change health behaviours.[13] Therefore, this situational assessment is intended to help HPEPH understand the extent of access to opportunities for PA in rHPE and develop evidence-informed strategies to address the determinants of PA among older adults in rHPE. Thus, the objectives of this assessment are to:

- Increase understanding of the factors that influence PA among older adults in rural communities
- Understand the scope of opportunities for PA that are available for older adults in rural HPE
- Determine appropriate population health promotion interventions to increase access to opportunities for PA in the rural areas of HPE

2. METHODS

2.1 Research Questions

To achieve the objectives of the situational assessment, the following research questions were investigated:

1. What are the determinants that influence PA among older adults in rural communities?
2. What are effective population level interventions for increasing PA among older adults in rural communities?
3. What is the status of the interventions and determinants that influence older adult PA in rHPE?

A rapid review was completed to investigate the first two questions using the methodology established by the National Collaborating Centre for Methods and Tools.[1] The results of this review served as a basis for key informant interviews with community stakeholders to gather local perspectives of the determinants of PA and understanding of existing PA interventions for older adults in HPE.

2.2 Definitions

The following definitions were used in this situational assessment.

- *Older adults* are defined as people aged 65 and older who are living independently in the community.
- *Rural Hastings and Prince Edward Counties* include the rural communities of Hastings County and the County of Prince Edward. The small urban communities of Belleville and Quinte West are not included in this assessment.
- *Structured/Planned PA* is defined as repetitive physical activities that take place in one's free time, such as organized exercise programs, playing sports, and facilitated walking groups. This also includes independent, planned leisure-time activities, such as going for a walk or doing yoga at home for exercise.
- *Unstructured/Incidental PA* is defined as physical activities that take place due to the obligations of work and life maintenance, such as walking and cycling for transportation, gardening, or housework.
- *Built Environment* is defined as man-made structures, features, and facilities viewed collectively as an environment in which people live and work

2.3 Rapid Review

Search Strategy

Eight electronic databases were searched for articles published between 2007-2017 (Canadian Best Practices Portal, National Institute for Health Care Excellence, University of York Centre for Reviews and Dissemination, Health Evidence, CINAHL, Medline, AgeLine, SocINDEX) using the following key search terms: chronic disease prevention, PA, mental health, injury prevention; older adults, 65 or older, elderly, aging; rural; interventions; and determinants. Additional review articles were also identified through reference lists from review articles found in the initial search.

Evidence Selection

Due to the limited amount of published research that focused specifically on PA interventions and determinants among older adults dwelling in rural communities, we chose not to limit our search to exclusively rural settings. Likewise, if an article focused on adult populations of any age in rural settings it was included in this rapid review. This helped to ensure adequate inclusion of evidence on both attributes of our priority population: older adults and rural settings. A further challenge in finding evidence was the variation in the definition of older adults in the published research, with reviews ranging from 50 and older to 65 and older. Therefore, to understand the range of interventions and determinants that affect people as they age from mid-life to older age, reviews among populations 50 and older were included. Therefore, we chose to include filtered evidence from summaries, reviews of systematic reviews, and systematic reviews of single studies[14] that met at least two of the following three criteria:

- Focused on older adults 50+ or adults in general if the review had a uniquely rural focus
- Assessed the effectiveness of interventions on PA outcomes or provided insight into the physical, social and individual determinants of PA, for community-dwelling older adults
- Focused on rural and/or remote settings

Articles were excluded if they:

- Focused on older adult PA programs in institutional care or primary healthcare settings (e.g. counselling or referral programs)
- Were reviews of interventions and determinants that focused on PA and its link to a single chronic disease or injury outcome.

The initial search yielded 350 articles. Following the removal of duplicates, and an initial screening of titles for relevance, 62 abstracts were assessed further for relevance and an additional 29 articles were excluded. The full text of 33 articles was retrieved and assessed for relevance; as a result, 24 articles were identified for quality appraisal.

Quality Appraisal

The included systematic reviews and reviews of reviews were appraised by two independent researchers using the Health Evidence Quality Assessment Tool for Review Articles.[15] Discrepancies in appraisals were discussed and consensus was achieved. Pre-appraised public health guidelines and review articles, that were either pre-appraised or appraised by the investigators as moderate and strong, were included in the review. Two review articles were excluded for their weak quality rating.[2,16]

Data Extraction & Synthesis

For each included review, the following data were extracted: author and year of publication, age range, setting, type of PA, outcome measures, key findings or recommendations, and limitations, as per Appendix A Rapid Review Extraction Tables. A narrative analysis grouped key findings into themes, then categorized the evidence into findings for rural and urban or undefined settings and weighted it, according to the level of evidence and quality rating, as per Appendix B- Evidence Synthesis Tables.

Description of Included Studies

This rapid review included two summaries from the National Institute for Health and Clinical Excellence,[17,18] three reviews of systematic reviews obtained from peer reviewed journals,[19–21] and one review of systematic reviews from grey literature,[22] in addition to 14 peer-reviewed systematic review articles,[23–35] 1 scoping review,[36] and one systematic review from grey literature.[37]

There were 11 articles that assessed effective interventions for increasing PA in older adult populations,[20,21,24,26,30,32–36,38] four of which were focused in rural settings.[24,33,34,38] There were nine articles that assessed the individual and environmental determinants of PA among older adult populations,[19,22,23,25,27–29,31,37] three of which focused on determinants in rural settings.[22,27,28]

The included articles were comprised of multiple recommendations for the implementation of PA interventions, for modifying the determinants of PA, in addition to PA interventions to promote mental well-being among adults age 65 and older[17] and among mid-life adults aged 40-64 to prevent dementia, frailty, and disability later in life.[18]

2.4 Interviews

Sampling

Purposeful sampling was used to identify key informants involved in the delivery of programs and services for older adults in rHPE. A total of seven agencies were invited and agreed to participate in this study. Four non-profit older adult support agencies that provided services to older adult populations in HPE, within different geographic regions of HPE, participated in the study. Two community health agencies that offered primary health care and support services within rHPE, two representatives from geographically distinct rural municipalities, and one resident with extensive experience working with both non-profits and municipalities, participated in the study. The sampling strategy ensured each region of HPE was represented and resulted in the attainment of saturated findings.

Potential informants were contacted by telephone and/or email and invited to partake in this assessment. After agreement was received, each participant was provided with a consent form and a standard interview guide prior to their interview to allow participants adequate time to formulate their responses. All interviews were completed in-person at locations preferred by participants. All interviews were audio-recorded after obtaining participant consent. Recordings were securely transferred to a third-party transcription company and returned in accordance with the Personal Health Information Protection Act.

Analysis

Transcriptions were subsequently entered in a Microsoft Excel spreadsheet, coded, and analyzed using thematic analysis. Analysis was completed cooperatively by two researchers where categories and themes were refined and verified for internal and external validity through discussion and consensus.

Ethics

The research proposal for this component of the situational assessment was reviewed for compliance with HPEPH's Scientific and Ethics Review policy.

3. RESULTS

3.1 Opportunities for Physical Activity in Rural Areas

Exercise Programs

Exercise programs are group-based classes that are led by trained instructors. The types of programs commonly frequented by older adults in rHPE include Tai Chi, active living classes, line dancing, chair yoga, and gentle exercise programs. They are usually delivered by non-profits that provide support services to older adults and by agencies, such as libraries, Community Health Centres, or Family Health Teams. The Victorian Order of Nurses (VON) is a key provider of older adult group exercise programs throughout HPE. They receive funding from the South East Local Health Integration Network (LHIN) to offer the Seniors Maintaining Active Roles Together (SMART) exercise program and the theory-based Falls Prevention program throughout the region.

Privately run group exercise programs are offered by physiotherapy clinics and fitness clubs in rural settlement areas, which may be available to the general public. While these privately-run exercise programs may be frequented by older adults, they are often designed with younger adults in mind. The exercise programs offered by non-profits tend to be tailored to the needs of older adult participants. They are offered at low- or no-cost and designed in a way to meet the physical abilities of different people.

> …I have a mix of two younger ladies, but they're 65 but they present like they're in their 50s. Pretty fit, I was even concerned that the class might not be challenging enough for them, but they actually are finding it challenging. Then I have three or four 94-year-olds in the same class. So we get a mix of everybody, because you can adapt every exercise and change the resistance bands to make it harder and that sort of thing. So you can make it challenging for everybody. (Community Health Agency)

The Falls Prevention and SMART programs offered by the VON are delivered by paid, certified fitness instructors or Registered Kinesiologists. Other exercise programs offered by non-profits are most often facilitated by trained instructors and/or volunteers. Some are certified in Seniors' Fitness Leadership, and others are trained and experienced in specific types of group exercise. One agency described how the volunteer instructors play an important role in the care for seniors, beyond PA:

> If they see that someone is failing or just not exactly doing too well, we receive a referral back and will send out a Regional Care Coordinator or someone to see what's happened. It's very much a circle of care. (Older Adult Support Agency)

Respondents described various organized sport programs available for older adults in rural communities for structured/planned PA. Popular organized sports include curling, golf, hockey, pickle ball, lawn bowling, cycling, badminton, and volleyball. While some of these activities are frequented by older adults, they often are designed for various ages.

Programs such as curling, golf, and hockey are facilitated by organized clubs. Sports like pickle ball and volleyball are organized by groups of residents or community associations with

a common interest in these activities. While they are popular with some older adults, there is typically a cost to participate, which is a noteworthy barrier for others.

> Some of the more organized sports, I think there's a men's seniors hockey group, there's volleyball at the gym, women's hockey, but then a lot of those things come with a cost and I think that's the biggest barrier from some of our seniors, is the cost, (Community Health Agency)

Supporting Evidence

Four strong quality articles identified that theory-based exercise programs have the potential to be effective at increasing PA in the short-term; two reviews of reviews focused on older adults in general settings,[20,21] and two systematic reviews focused on adults in rural settings.[24,33] Walsh et al. found that theory-based interventions were mostly effective in rural communities,[33] while Cleland et al. found positive effects in interventions that used objective outcome PA measures.[24] In a review of 17 systematic reviews, Olanrewaju et al.[21] concluded that a variety of interventions are effective in achieving short-term uptake of PA behaviours among older adults in general settings, including group delivered, centre-based, and theoretically underpinned cognitive approaches.

Zubala et al. synthesized 19 systematic reviews and found that theory-based program interventions can be effective at achieving sustained improvements in PA over 12 months.[20] However, they concluded that programs using exclusive psychological and cognitive behaviour change techniques are less suitable for older adults and that a "whole system-oriented approach is required that is tailored to meet the needs of older adults and aligned with individual, social and environmental factors".[(p. 2)] Educational approaches that include cognitive and behavioural techniques that are more successful in younger adults may not be equally appropriate for older adults.[20] Older adults require motivation from benefits other than purely cognitive increases in knowledge as they feel superior to younger adults with regard to knowledge of health behaviour[39] and PA behaviour in particular.[24]

Several reviews noted effective characteristics of program-based PA interventions for older adults, including:

- Tailoring programs to individual needs, personal preferences, and characteristics, such as level of self-efficacy, age, cultural factors, and interests.[17,20,21,34,38]
- Programs which are enjoyable, fun, and achievable.[21,35]
- Meaningful involvement of older adults in the co-creation, design, and delivery of programs and interventions.[17,20,21,32]
- Programs with personal contact and support from leaders.[21,34]
- Programs that include a variety of activities,[17,38] or that are walking based.[20,36]

Interestingly, the mode of delivery (group or individual), setting, and the background of exercise program providers were not necessarily associated with effectiveness in two strong quality reviews of reviews.[20,21]

Walking Programs

Walking was identified as the most common structured/planned PA for older adults in rural communities. Most of the Older Adult Support Agencies partner with secondary schools to coordinate indoor walking programs. Indoor walking programs in secondary schools are present in Picton, Centre Hastings, and Bancroft, and there is an indoor walking track in Wellington. These are long-standing programs that are generally supported by volunteers. These were noted to be important programs that promote safety, social interaction, and PA, and in some instances provide the only PA program available for older adults in the respective community.

> But in the winter it is the scariest time for them, so some of them either stay isolated or they will utilize our walking program, so I am trying to push the walking program. Because they can go there and be safe, you know, because they are walking inside and it is all on one level. But other than walking in the winter, it doesn't seem like seniors are involved in much up here. (Older Adult Support Agency)

There are also non-profits and municipalities that support walking for leisure by facilitating pole walking programs on community trails, and by providing maps of trails and walkable areas within the community. Trails, community gardens, parks, and lakes were identified as important assets that support structured/planned PA for older adults.

Supporting Evidence

Walking programs were shown to be an effective means of promoting PA.[20,36] Zubala et al. noted the frequency of walking-based interventions in PA research and suggested that they are common due to their universality and high acceptability in the older adult populations.[20] Farren et al. found that walking programs in general settings may have the potential to increase PA among older adults, but the outcome on PA behaviour remains inconclusive.[36]

Considering that theory-based PA programs and walking schemes have been shown to have the potential to achieve short-term increases in PA, older adults require easy, barrier-free access to these opportunities. In their summary of effective PA interventions for improving mental well-being in people over age 65, the National Institute for Health and Care Excellence (NICE) recommends the delivery of exercise programs by qualified professionals, and the establishment of walking schemes appropriate for older people.[17] Furthermore, NICE recommends that a variety of supervised recreational activities and exercise programs, in addition to supportive infrastructure and facilities, be accessible to all ability levels, so people have opportunities to be active in different ways at different intensities. This is particularly important as a midlife (age 40-64) intervention to prevent frailty and disability in later life.[18]

Unstructured Physical Activity

Unstructured/Incidental PA are those that older adults engage in due to the obligations of work and life maintenance. Dog walking; walking to get mail, buy groceries and to run errands; gardening; and household chores were noted as PA activities among older adults. Bancroft, Tweed, Madoc, Picton, Wellington, and Marmora have community gardens which are commonly used by older adults. All respondents noted that gardening is an important PA for older adults in their community.

> Gardening is a huge one in this community. People are still gardening vegetables and fruit and canning and doing all those types of things because that is a part of their independence, so they are still doing all that, even well into their 80s. Gardening is huge up here. (Older Adult Support Agency)

3.2 Individual-Level Determinants of Physical Activity

The individual determinants of PA among older adults that were identified by respondents included the level of motivation to participate in an activity, health status and disability, and caregiving.

Motivation to Participate

Personal motivation refers to the desire and choice of individual older adults to participate in PA. Respondents noted that older adults are not unlike the rest of the population, and some simply do not have the motivation to be physically active. The motivation to participate in PA is shaped by an older adult's experience with PA over the course of their life. If an older adult was active as a younger person, they tend to continue to value it as they age.

> They don't feel that maybe it [physical activity] is important, right, because they haven't done it. (Older Adult Support Agency)

There may be a difference in types of PA between older adult residents who have recently settled to rural areas from more urban areas, and the long-time residents of rural areas. Newly settled residents are more likely to participate in structured/planned PA programs, where long-time residents participate in more social programs and more limited forms of incidental PA, particularly in the more remote rural settings.

> I don't think that is the same for the kind of long-time resident [region] seniors and the ones out in the rural area. I don't think they are participating in those activities [organized sports]. But I do think we would see them more in bridge clubs and Tai Chi programming and things like that. I think there is a really large percentage of long-time resident seniors in [the region] who don't have any regular physical activity, especially if they were living in a rural area. I'm sure that there are many that spend a great deal of time in their home and that is it and maybe only get out of the home for grocery shopping and maybe getting the mail and things like that. (Older Adult Support Agency)

Experience with Physical Activity

Many older adults in rural settings may not consider incidental activities, those activities that take place due to the obligations of work and life maintenance, as a form of PA. Rather, they participate in these activities because they have always been part of their lifestyle. Joining an exercise program or organized sport is new for many older adults and their lack of knowledge, skills, and confidence may affect their motivation to try something new. Encouraging older adults to begin a structured/planned PA program that they have never done before can be daunting without guidance and support, as they have never developed the necessary physical literacy.

> But when you're talking about people doing stuff on their own time outside of walking, it's like the education piece; they're not sure what to do. And then if you go into a community centre with just a big room again, there's no equipment or anything, and they're not sure what to do with their own bodies. (Community Health Agency)

Health Status

The health status of older adults is a factor that influences whether older adults are physically active. Older adults who are relatively fit and have few health conditions tend to engage in PA. However, those whom are frail or experiencing chronic conditions are limited in their ability to be active. Physical and cognitive limitations, changes in health status, varying ability, lack of endurance, frailty, and sensory loss, such as hearing, are noted barriers to PA.

> So I think fear is a big thing, fear of exacerbation, so some of those issues, diabetes again, just fear that you know if I do something then I [my blood sugar will] spike or … Yeah I think that would be a big issue, and they're alone so considering that if I overdo something I'm gonna be on my own … (Older Adult Support Agency)

The National Institute on Aging defines frailty as "a clinical syndrome, distinct from, but related to, aging, disability, and the presence of co-morbidities. It is multidimensional and characterized by declining reserve and diminished resistance to stressors. It is the result of a number of impairments that, in aggregate, reduce an individual's functional ability."[40] Loss of muscle strength, endurance, and frailty can have significant impacts on being able to manage even daily living tasks, such as walking to the store, carrying groceries, and house cleaning.

> I would say endurance, like being able ... Like just keeping it up, like to vacuum a two-storey house for us it might take an hour, but for them it would take an entire day, right? So that endurance piece, where it's almost overwhelming for them so they might do a little bit and then go off and do something else. (Community Health Agency)

Supporting Evidence

Two strong quality reviews of systematic reviews of PA among older adult populations in general settings[21,25] and one moderate quality systematic review of older adult populations in rural settings[27] identified individual-level barriers and enablers of PA. Perceived value of PA, poor awareness, and access to opportunities for PA were identified as barriers by Olanrewaju et al.[21] Low self-efficacy, previous experience with PA, and health status are frequently noted as individual level determinants,[21,25] and may be more common barriers to PA in rural areas.[27]

3.3 Environmental-Level Determinants of Physical Activity

Environmental determinants involve both the social and physical environment. Social determinants include income, social isolation, ageism, gender, stigma, community safety factors, and communication. Physical environmental determinants include weather, as well as built environment factors, such as transportation, accessibility, housing, and technology. The most commonly mentioned barriers to PA for older adults included transportation to

access facilities and programs, as well as the cost of transportation and participating in those activities.

Social Environment

Living on Low-Income

Living on a low-income is the predominant barrier to participation in PA for older adults. This was consistently noted across all rural areas of the region. The costs associated with participating in PA, whether it is the associated fees or transportation costs, influence whether older adults participate in structured/planned PA. When compared to other health needs, PA is not prioritized when living on a limited income. However, older adult support agencies and municipalities recognize this barrier and offer low or no cost programming and transportation services.

> We do a lot of… I never mentioned the public skating; there's a lot of free public skating as well in the wintertime. Yes, many, many days of the week, and if you don't have skates, there's a bunch at the arena. They just give you a pair if there's a pair that fits you. They don't rent them, but they'll give [them to] you. People donate them when they give them out, and there is a specific day for seniors; adult and seniors skate. (Municipality)

> We're offering [transportation] for free because that is what we hear from people, that transportation is an issue. Whether it is because they don't drive anymore, or they don't like to drive in the wintertime, so we've offered free transportation and we've tried to educate seniors on the fact that there is transportation available. (Older Adult Support Agency)

Social Networks

Social isolation experienced by older adults was identified by all respondents as a critical barrier to PA, social engagement, and overall well-being. Respondents recognized that isolation affects the mental, physical, social, and cognitive health of older adults and described the intersection between the determinants that influence social isolation, including poverty, transportation, affordable housing in settlement areas, and the loss of social support networks. Respondents had concerns about the challenge of reaching and engaging isolated older adults. As a result, isolated individuals were often described as being the most vulnerable.

> If somebody is all by themselves and they're not getting out, chances are they've never heard about the program or they have no idea it's even next door. We have classes in apartment buildings where they have no idea [there is a class]; they ended up walking down to do their laundry and saw an exercise class going on. And you're thinking, well there's posters everywhere, everybody in the building's doing the class, but they don't get out of their apartment right? (Community Health Agency)

Adding to issues of social isolation were perceptions of the appropriateness of participating in PA related to age stereotypes, and gender roles were occasionally identified as barriers.

> What I find is males are the hardest to get them involved in anything, not just physical activity - in just coming out to be social, Diner's [Club], again a lot to do with pride and maybe what their old fashion traditions were, or you know, what their beliefs are, what a man and a woman should do. (Older Adult Support Agency)

> Well and there's a lot of stereotypes around, "Oh well I'm older so I don't need to do that." Or, "I shouldn't be doing that anymore, I shouldn't be exercising." (Community Health Agency)

Closely related to social isolation, having social support was identified as a facilitator for PA in older adults. Having someone with whom to drive, having a spouse, friend or neighbour with whom to participate, and building social connections within a program encourages participation and accountability.

> And I think having a program keeps them accountable too. They know that every Tuesday their instructor is going to say, "Oh well so and so isn't there." Or their buddy is relying on them to get to the class so they're more apt to go. Then it makes it more fun because they're going to Tim Horton's or whatever afterwards to have coffee and catch up. (Community Health Agency)

Alternately, personal commitments, such as medical appointments and caregiving responsibilities within one's social network, are barriers to PA. Looking after grandchildren, spouse, the lack of affordable respite care, and the stresses inherent in their role as caregiver, limit the capacity of some older adults to look after their own needs, including PA.

Supporting Evidence

Interpersonal determinants, such as the interactions people have with others, and their social and cultural expectations, shape health behaviour[12] Two strong quality reviews of reviews, two strong-to-moderate quality systematic reviews of PA studies among older adult populations in general settings,[21,23,25,37] and three moderate-quality systematic reviews of studies among older adult populations in rural settings,[22,27,28] identified barriers and enablers of PA that are influenced by the social environment. Cultural sensitivity, cost, living alone, lower educational attainment, and not being employed full-time were barriers identified by Chastin et al [21,25] Social support from friends and family is an important determinant of PA in older adults in general settings,[21,23,37] and there was moderate quality evidence that this is also a determinant among older adults in rural settings.[27] In their systematic review, Boehm et al. found that commitments to work, family, and community obligations are barriers to PA among older adults in rural settings.[27] The perception of safety from crime was identified as a facilitator for PA among older adults in general settings in two strong quality reviews of reviews[21,25] and one moderate systematic review,[37] and it was also demonstrated to have a beneficial effect in two moderate quality systematic reviews in rural settings.[22,28]

Social support from family and friends, in addition to advice from health care providers, can be effective at encouraging older adults to become more physically active. Both Olanrewaju et al.[21] and NICE[17] suggested that brief advice from health care providers on the recommended levels of PA, in addition to providing information on where to access PA opportunities, can be effective in the older adult population.

Built Environment

In rHPE, aspects of the built environment—the human designed features of a community environment—influence the opportunities that older adults have for structured/planned PA and unstructured/incidental PA. The built environment also affects perceptions of physical and emotional safety, which influence decisions to engage in PA.

Public Transportation

Lack of accessible and affordable transportation were identified as barriers to PA, particularly for older adults living outside of settlement areas or without access to a car. Modes of transportation used by older adults in those situations include walking, relying on family, friends or neighbours, carpooling, accessing volunteer-drivers from local support agencies, public transit, and specialized transit for those with physical limitations.

Even with transportation, the distance and travel time is a barrier in more remote rural areas. The time and effort needed to get to a class or a facility deters people from accessing structured/planned PA. In many areas of HPE, limited scheduling of public transit limits time available for structured/planned PA. Older adults may need to choose between accomplishing tasks such as banking and groceries and participating in a PA program.

> Yes, they [those living in rural areas] just don't get the transportation to anywhere, but you can walk out your door and the town has sidewalks everywhere, you can walk around. If you're out on the more rural areas, then you're walking on a dirt road or something like that which might be hard for some. But, there are a lot of barriers once you get out of town – transportation being one, even like level ground to walk on would be one. (Older Adult Support Agency)

Access to public transportation varied from region to region. In some areas there is public transit available in larger towns, to a lesser extent in the smaller hamlets, and no transit in the remote rural areas. Although one respondent noted that the transit services in their community were good, most respondents identified that the lack of transportation has far reaching implications for those living in rural areas. It prevents them from accessing services, creates a barrier to social engagement, and may result in older adults having to relocate from their home and community.

> We were certainly hearing from numerous agencies that the lack of transit makes it definitely … difficult for seniors to stay in their homes that are not close to essential services, maybe as long as they would want to. They may be only challenged by their inability to obtain a Driver's License, but otherwise fully functioning and that alone can be a massive restriction to their social engagement and engagement in programming and everything else. (Older Adult Support Agency)

Facilities

The availability of recreation facilities was described as an enabling factor for PA programs. Indoor facilities that support organized sports, such as curling clubs and hockey arenas, as well as both private and non-profit facilities that offer exercise programs and fitness equipment provide an excellent venue for PA. In one municipality, the availability of

municipally owned and maintained community halls was noted as an asset to non-profits and community groups that offer both PA and social programming.

> …there are community groups which are informal organizations, or someone is putting on classes or collecting funds from all the participants to rent a space to have some of those activities I mentioned, which is entirely separate from the Municipality unless of course they are accessing municipal facilities. And currently the Municipality makes those facilities where a lot of that programming takes place, available at a very affordable rate, extremely affordable. So they enable it that way. The [name of region] doesn't get involved in delivery of recreation programming directly, so we operate facilities that outside groups can use for programming… (Municipality)

Outdoor facilities were also described as an important asset, including lakes, parks and recreation trails. Many municipalities have recreation trails; however, the degree to which they are maintained and accessible for older adults of varying physical abilities differs.

> Yes, nature is a big one. The fact that there are like accessible pathways that people, like all these picnic tables are accessible, they flip up and wheelchairs can come right in and…(Municipality)

> In terms of trails, we have trails. A lot of them are not maintained as well as we would like, but we don't have any that are accessible in definition of accessible, so that really makes it so a lot of people that have any kind of physical limitations, you know, require a walker or some other kind of equipment, it makes it very difficult for people to actually get out. (Resident)

The weather is a common barrier to PA among older adults, both in summer and in winter. In summer, outdoor walking in extreme heat is discouraged for some older adults due to health concerns, and a lack of climate controlled indoor facilities for use in extreme heat and in winter is also a barrier to participation. In winter, the condition and maintenance of outdoor facilities affects PA in the winter months. For those using walkers, snow covered sidewalks, even with small snowfalls, were identified as a challenge to accomplishing daily tasks such as grocery shopping or going for a walk. The fear of falling in the winter snow and ice, even when surfaces have been ploughed and salted, remains a concern for older adults. The winter driving conditions and shorter daylight hours may cause many to avoid committing to PA programs and other activities. Even though modest winter weather conditions can be a barrier for frail older adults with mobility limitations, outdoor facilities are available and maintained in winter to facilitate PA for general populations.

> …the fairgrounds has a walking track, they have a big track and even in the winter they plough it. They keep it walkable for as long as they can. So it's a nice place to walk in, walk your dog and everything. (Municipality)

Active Transportation Infrastructure

The towns within HPE have various levels of walkability. Many respondents described the presence of connected sidewalks, paths, and supportive infrastructure, such as lighting and crosswalks, while others acknowledged gaps in their pedestrian networks.

> There are some areas where sidewalks require improvement or where, for instance, there are subdivisions that were approved that never had sidewalks. There are some relatively new subdivisions and there are no side-walks. There are no sidewalks in [Town A]. There are 800 residents, mostly retirees…and that entire subdivision has no sidewalks, which is very odd, right? (Municipality)

Traffic concerns, such as high traffic volumes, speed, congestion, and lack of crosswalks, were highlighted as barriers to walking for transportation and recreation, particularly in towns that are tourist hubs in summer and those with Provincial highways that run through downtown cores. Outside of settlement areas, road conditions and driver behaviour are barriers for both walking and cycling. Road conditions include factors related to cycling or walking on highways, dirt roads, uneven ground, and a lack of paved shoulders. Personal security concerns were occasionally mentioned, including fear of walking alone in the absence of pedestrian traffic and feeling threatened by people whom they encounter when walking.

> Another kind of a hurdle that we have, we have seniors who live in this building right here, and they are afraid to walk down along the river because there's some-- I guess they would call them, like, undesirables that hang out on certain corners and make them feel threatened. (Older Adult Support Agency)

Accessibility

Accessibility factors either facilitate or inhibit the ability of persons with a variety of disabilities to participate in PA. Factors vary from community to community and affect both structured/planned PA and unstructured/incidental PA. Respondents mentioned the accessibility assets in their community and the need to create more accessible built environments. Actions for improving accessibility included raising awareness at the municipal level; working with municipal committees to address accessibility; availability of funding sources; developing accessible fitness facilities and adaptive equipment; as well as improving infrastructure, such as accessible walking paths, trails, washrooms, and audio pedestals at crosswalks for persons with sensory impairment.

> Also, there are no facilities available for older people with disabilities to get involved in things, you know, other physical activities. There is no adaptive equipment available, for example, being able to get them out on the water or even a couple of years ago, we were going to write a grant for, this was with [a community organization], for having from the main sidewalk into the park into the river front to have that made an accessible pathway, but the town was not too interested in that, which was disappointing. Because for many people, you know, being able to actually get to the water or you know, or even to get into the park to have a picnic or that kind of thing is a challenge. (Resident)

Supporting Evidence

The buildings, facilities, spaces, and infrastructure in community settings that are created and modified by people, known as the built environment, can make it easier or harder for an individual to adopt a health behaviour.[41] There was strong to moderate quality evidence from one summary[18], one review of reviews,[19] and three systematic reviews[25,29,37] that indicate that walkable community design is an important determinant of PA among older adults in general

settings. There was also moderate quality evidence from one review of reviews,[22] and two systematic reviews in rural communities.[27,28] Notable walkable features include connectivity, land-use diversity, and the presence of sidewalks and cycling infrastructure. Other features of the built environment shown to influence older adult PA in both rural and general settings include the availability and accessibility of recreation programs, indoor recreation facilities, and outdoor facilities, such as parks, trails and green spaces.[18,21,22,27,28]

3.3 Organizational Capacity for Physical Activity Promotion

All respondents described many of the factors that enable and challenge their ability to provide older adults with group exercise and coordinated walking programs. Participants identified key factors for program delivery: qualified instructors, volunteers, and staff dedicated to delivering and coordinating programs. Access to facilities was another factor identified. Those agencies that had well-established programs gave the impression of having access to these resources. Agencies, with limited access to these resources, appeared to face challenges in meeting the PA needs of older adults.

Human Resources

Having access to qualified instructors for group exercise programs is a challenge in most rural communities. Even organizations with stable funding for exercise programs struggle to employ qualified fitness instructors in a rural setting. Some agencies do not have the financial resources to have the qualified staff needed to deliver sustainable programs that meet the demand.

> I think our challenge for our program specifically is that in those rural communities there aren't a lot of qualified fitness instructors. Or if there is an instructor, there's only maybe enough participants to have one class a week. So that person's only working a couple of hours a week, and it's very hard to maintain staff that way … It's much more difficult to find an instructor and keep them because having only a couple of hours a week, it's not manageable. (Community Health Agency)

Most of the exercise and walking programs provided by non-profit agencies are facilitated by volunteers. Volunteer older adults are a critical asset to providing care and support for one another, including supporting opportunities for PA. However, relying on volunteers, particularly older volunteers, brings unique challenges to sustaining PA opportunities. The nature of volunteerism in rural communities is changing as the population ages. As the older adult volunteers age, younger ones are not necessarily taking their place, and as a result, the continuation of programs for seniors is challenging to sustain.

> One of our challenges that we come across in community support agencies is that our volunteers become our clients overnight… we actually keep an eye on our volunteers too, to make sure that everything is okay with them. We cannot seem to get the younger people to be involved, and the reason is that they're too busy with their own lives. (Older Adult Support Agency)

The availability of programs is dependent on the availability of either staff or volunteers to take it on and make it available to the community.

> …whenever we have an idea for a program it's like, okay this is a great idea but who's going to run it? That's where it all dies every time. So, we kind of pick what fruit we can pick, but there's still a lot of things that I think people would like to see done, but we don't have the people, we don't have the volunteers, or we don't have the staff. (Municipality)

Financial Resources

Capitalizing on paid staff to coordinate PA programs run by volunteers was evident in those Older Adult Support Agencies that offered PA programs. Most received funding from the South East LHIN for a variety of health and social programs that support older adults, but they do not receive specific funding to deliver group exercise or walking programs. Those that did offer group-based exercise and walking programs considered them to be social support programs and utilized their paid staff to coordinate these low-cost initiatives that were sustained through fundraising and delivered by volunteers. Other agencies were strained by their limits on funding or the costs associated with coordinating group-based programming.

> We try to be somewhat creative. We have our legal agreement side with them, so we have to meet those targets. You know, the barrier to the agency, even if you were able to start something like this, if you could do it sort of off the side of your desk. (Older Adult Support Agency)

Low-income is a critical determinant of health in rHPE, thus keeping costs low for PA programs is necessary. This challenges the ability of municipalities and agencies to pay staff to coordinate and supervise PA programs.

> We have to get a grant or the municipality has to foot the bill because, even public skating, if they ask for $ 2.00, people won't come. So, things have to be free and that's hard and then you need personnel. So they have to be volunteers, and that's the problem. I think if you look at the demographics around here, it's just under half that are on assistance or making very little money. So, it's understandable that they cannot afford to do these things, and then the population that does have the money to do it isn't enough to keep something running. (Municipality)

Some organizations in rHPE experience barriers that may be related to the poor economic environment within the region, where there are not enough resources among the community organizations to share with the larger community.

> I go to presentations at the [municipalities] and ask for support for either space, you know, free of charge or at a lower fee, or some kind of a donation, because we are non-profit. And some kind of a donation to help us to be able to provide these things for seniors, then they are not supportive. They said, they have no space to offer and if they did, they cannot offer it at a free or a reduced rate. So like the [service club hall], we wanted to rent. It is over $700 to rent. It is not feasible for us. (Older Adult Support Agency)

Facility Resources

Community agencies and municipalities expressed the value of partnerships to enhance their capacity to provide PA opportunities for older adults, particularly for accessing facilities for

programs. Well-established programs in rHPE are those that have partnerships that enable access to community halls and other spaces appropriate for group-based PA. In-kind contributions of space, such as schools, libraries, retirement residences, and municipal halls, are necessary to run programs, as funding most often does not cover rental costs. Despite these locations, most respondents indicated that there is a lack of appropriate facilities where group-based exercise programs can be provided. Despite having interest and demand for a specific program among older adults, there may not be adequate physical space within a community to offer it.

> Like the falls prevention, I mean if we have the space we'd love to host it here, but we just don't have the space for that. (Community Health Agency)

In some areas of HPE, there are strong partnerships between the municipality, which is responsible for providing the community halls as facilities for recreation programming, and non-profits and volunteer committees who coordinate and deliver the recreation programming.

> The municipality makes facilities, where a lot of that programming takes place, available at a very affordable rate, extremely affordable. So they enable it that way. The [municipality] doesn't get involved in delivery of recreation programming directly, so we operate facilities that outside groups can use for programming. (Municipality)

Communication

Direct communication with seniors, word of mouth, newspapers, pamphlets, flyers at postal offices, and agency referrals were all mentioned as effective channels of communication that help to encourage participation in programs and PA behaviour. Social media is viewed as an appropriate channel to reach the caregivers of older adults, rather than the older adults themselves.

> The municipality increasingly tries to engage the community through multiple channels, not simply relying on newspapers or simply just relying on a website, so that continues to be important in the community with a high population of seniors. (Older Adult Support Agency)

3.4 Key Actions for Older Adult Physical Activity Promotion

Determinants to be Addressed

Most of the recommendations involved acting on factors within the social and built environment that help facilitate access to opportunities for PA. These included improving community design features and infrastructure related to accessibility, walkability and bikability, and increasing access to facilities for recreation. Actions such as reducing poverty and social isolation, and improving supportive social networks, were also noted as important. The most common recommendation was the need to improve access to public transportation. All participants highlighted the need for more affordable, accessible, and convenient transportation options, not only to access opportunities for PA, but also to improve overall health and well-being by reducing isolation and increasing access to community supports and services (Figure 1).

At the individual level, improvements can be made by increasing awareness of programs and opportunities in the community and offering peer mentorship to support older adults in trying new and unfamiliar activities. For those who cannot attend programs, providing tailored interventions could enable them to engage in PA in their own homes.

> I think we really need to get out to those individuals that are marginalized and really get to know them and build up the trust and relationship so that we can start to get people into other social settings. (Community Health Agency)

Strategies for Addressing Determinants

Respondents identified three activities that would help build capacity for addressing these factors: enhancing collaboration, improving communication, and facilitating program delivery and participation.

Figure 5. Recommended areas of action for improving older adult physical activity in HPE

Built Environment

- Public Transportation
  - Affordable, accessible and convenient transportation options in rural areas
  - Facilitate car-pooling
  - Scheduled transportation for PA programs
- Active Transportation
  - Improve sidewalk connectivity and pedestrian crossings
  - Make cycling safer in both settlement and rural areas, including highways
  - Locate facilities and services close to where older adults live
  - Address community safety features (e.g. lighting, visibility)
- Accessibility
  - Make trails and parks accessible for wheelchairs and walkers
  - Improve the condition of sidewalks
  - Convenient and accessible parking

Social Environment

- Reduce poverty
- Enhance social inclusion and social support networks

Enhancing Collaboration

Participants voiced the need for collaboration and partnership across sectors in HPE to effectively address the social and built environment determinants of PA. Potential partners include municipal staff and councils, PA and transportation providers, agencies working with older adults, as well as those of other age demographics. Also mentioned were the business community, community groups, and older adults themselves.

> We have these resources, they are fixed, we don't do everything and you don't do everything, so can we fit some things together, so that the product is greater than the sum of its parts really and you are able to achieve things locally that support seniors through partnership instead of trying to lead people to their own devices or their organization's own devices to deliver things. (Municipality)

Establishing partnerships in accessing facilities for PA programs was identified as a need in some communities, and in others, it was recognized as a key to existing success. Almost all organizations that provided PA programs relied on partnerships with libraries, municipal community halls, or seniors' residences to deliver programs at no cost. Often, the funding tied to PA programs does not cover the cost of facility rentals, and organizations that were unable to secure such partnerships struggled with the provision of programs. An example of a successful partnership involved an Older Adult Support Agency procuring funds to establish a mobile Seniors Active Living Centre to offer programming throughout the rural areas of the community. The in-kind contribution from the municipality to access the community halls at no-cost was important to the success of this program that allowed rural older adults to access programs closer to where they live.

Facilitate Program Delivery & Participation

The need to expand the availability of PA programs that are affordable, convenient, and easily accessible was evident. Recommendations include investigating public-private partnerships to make more facilities and opportunities available, for example, a retail store could host and promote a walking group. Low-cost solutions that could be offered to increase access to facilities for PA include:

- Use of common rooms in seniors' buildings.
- Working with schools to allow expanded hours of access (e.g. daytime hours, summer use).
- Accessing surplus school buildings or sharing school facilities to create senior-friendly community centres.

Several suggestions were made to improve the design of programs to encourage engagement and participation:

- Use peer mentorship to address people's inexperience with a new activity or fear of attending programs alone.
- Improving access to PA programs across the lifespan to establish the habit of being active so behaviour is sustained throughout later years.
- Combining programs offering social or learning activities, such as a Diners Club with a physical activity.
- Providing PA in-home programs and education to those who cannot attend community-based programs, such as in-home exercise coaching, and internet-based or live-streaming of programs into people's homes.

- Educating older adults on ways to include PA in daily living activities and helping them to think about how they can create PA opportunities for themselves, rather than relying on others to establish programs.
- In addition to educating older adults on the benefits of PA behaviour, considering ways to increase awareness in the community of what opportunities are available is important.

> More education to the public about what's offered out there. I feel like even in, say, my [name of town] class, someone mentioned about the pole-walking program in the summer and about half of the class didn't even know about it, and they live in [name of same town]. So, getting that information out there to make people aware of what is being offered is huge. (Community Health Organization)

Supporting Evidence

Two summaries suggested that encouragement of recommended levels of PA behaviour (planned and incidental), and promotion of opportunities for PA to mid-life and older adults could be an integral component of comprehensive strategies. Such strategies should include evidenced-based PA programs[17,18] and the creation of supportive community environments that encourage PA behaviour[18]

3.4 Public Health Roles in Older Adult Physical Activity Promotion

Knowledge Exchange and Advocacy

Respondents expressed that they would like to see public health have greater involvement in working collaboratively within the community. Public Health adds value and credibility to local issues by providing data, research, and information to support community priorities, and by helping local coalitions and agencies use evidence when approaching decision makers for support or when applying for funding.

> …public health, I believe, can tell us more about communities than we know. Is there, for example, something happening that we're not aware of, and I don't mean by – it may be health issues that we could share with our clients that we're not aware that's happening. (Older Adult Support Agency)

It was suggested that public health could play a valuable role in promoting the policies, resources, and opportunities available through Age Friendly Communities. Respondents felt that Public Health has a role not only in educating older adults on the importance of PA, but also in educating stakeholders on their role in developing social and built environments that support older adults, such as sharing evidence-informed policy options and funding opportunities with both municipal decision makers and community agencies. Public health is key to helping stakeholders understand the return-on-investment they could realize by addressing the needs of older adults, in terms of health and well-being.

> So, if you have [name of an agency] coming to councils or applying for grants through outside agencies to deliver things, having a solid foundation of factual information, support, whether it is letters of support or things like that from Public Health, speaking to how the proposed initiatives are addressed and those challenges and make those connections, I know that is very much appreciated. (Municipality)

Community Engagement

Several respondents were clear in their suggestion that public health needs to be more active in local communities, increase its visibility, and establish meaningful partnerships to improve the health of older adults.

> I remember years ago everybody knew what the health unit did, but there seems to be now, in the circles that I'm in…I'm at a lot of planning tables, in [name of municipality] and across the south east. Rarely is there anybody from the health unit there. OK. You['ve] go[t] to get out in the community and be a little more visible. (Older Adult Support Agency)

Furthermore, respondents had an ambiguous understanding of public health's roles in promoting and protecting the health of communities, and a lack of clarity about their programs and services. Several suggestions were made regarding ways to improve communication between public health, municipalities, community agencies and residents:

- Ensure that staff working within the community can share information on the full scope of programs and services offered by public health.
- Strengthen communication channels with older adult service providers and community agencies throughout the region. Respondents said that they are eager to share relevant information with their clients but noted that they receive little from public health.
- Use public health's communication channels to share programs and services being offered by community agencies.
- Provide stakeholders with opportunities for knowledge and skill development, so they can expand their understanding of health issues, resources, and programs relevant to their populations.

Public Education

Respondents were familiar with public health's role in public education. They offered suggestions to improve their reach to both older adults and the stakeholders with whom they engage:

- Use channels appropriate to older adults. For example, many older adults are not on the internet; they may prefer paper-based communications and information relevant to older adults through health care providers.
- When providing education or raising awareness, approach multiple locations in the community, and make use of local venues and events where people are already.

- Use a hands-on approach when communicating with older adults. Don't just share information; show older adults how to do things.
- Do not expect older adults to come to public health locations to receive education; go to the public places that they frequent.

Supporting Evidence

One summary included in the review made reference to key actions for public health to enable supportive built environments for PA[18] NICE recommends that public health authorities work across sectors with municipalities, transportation authorities, as well as land-use and public open space managers, to address the policy level factors that influence the development of supportive built environments for PA.[42,43] This includes ensuring the development of:

- Local, high level strategic policies and plans that support and encourage walking and cycling.[43]
- Priorities that ensure walking and cycling are core elements of local transport investments, including development and maintenance.[43]
- Comprehensive networks of routes for walking, cycling, and other modes of transport involving PA that are convenient, safe, and accessible to people of all abilities.[43]
- Programs to promote walking and cycling for recreation and transport purposes.[43]
- Planning applications for new developments that prioritize the need for people of all abilities to be active as a routine part of their daily life, and assess the potential impact of proposals on PA levels.[42]
- Well-maintained public open spaces that can be reached by walking, cycling or other mode of active transportation.[42]

6. Recommendations for Public Health Programs

Collaborate to Create Supportive Community Environments

Build collaborative partnerships between municipalities, older adult support agencies, community health agencies, and other community stakeholders to prioritize issues and address the determinants that affect the health of older adults in rural communities. Evidence suggests that physical activity is interconnected with health outcomes related to physical, mental, and emotional health in older adults. Hence, a holistic, upstream approach may yield multiple benefits for the health of rural older adults.

To achieve this, consider:

- Educating stakeholders about the opportunities available for promoting older adult health using an age friendly community approach.
- Using asset-based community development practices to leverage existing accomplishments in rural communities with the aim of strengthening knowledge, capacities, and opportunities with regard to healthy aging.
- Building readiness for policy development by raising awareness of the determinants of rural older adult health and municipal policy actions that support health and well-being.
- Actions that affect the following environmental determinants that, in turn, affect rural older adult physical activity and health:
    - Access to transportation
    - Level of income
    - Social inclusion and support networks
    - Supportive built environments related to accessibility, walkability and access to facilities for recreation
- Working with stakeholders to conduct health equity impact assessments on policies and programs that influence the above-mentioned determinants of older adult physical activity and health.
- Integrating an age friendly community perspective into internal public health built environment policy advocacy activities.

Prioritize Research and Surveillance on Older Adult Issues

Consult with older adult support agencies and municipalities to determine their research and surveillance needs for older adult populations and provide timely knowledge exchange activities to support the development of policies and programs that support rural older adult health.

Facilitate Public Education and Communication with Older Adult Populations

Work with older adult community stakeholders to develop effective communication channels for older adults in rural communities. Consider:

- Leveraging the opportunities to reach older adults through older adult support agencies and community health agencies in rural communities.
- Using public health communication channels to amplify the reach of community-driven older adult health and well-being initiatives.

7. Strengths & Limitations

Rapid Review

Several recurrent limitations to the research evidence on PA determinants and interventions emerged from this review, including:

- Limited evidence on the long-term effects of program-based PA interventions.[20,21]
- Heterogeneity of outcome measures, in addition to the limited use of objective measures, limited comparability of both individual studies and systematic reviews .[19,21–23,26,31,33,38]
- Inclusion of studies that have a high risk of bias.[20,24,31,33,34]
- Low quality, cross-sectional study design limited the establishment of causal evidence.[19,22,25,28,36]

Interviews

Dependability

All key informant interviews were audio recorded and professional transcription service was used to enhance the dependability of findings. Coding of transcripts within Microsoft Excel and documenting an iterative code dictionary established an audit trail for the researchers to revisit and reconstruct themes as new information was identified.

Creditability & Objectivity

The analysis was completed by two researchers who continuously revisited concepts and reached consensus in defining categories and themes throughout the analysis. The credibility of findings was strengthened through the use of triangulation, and wherever possible, the findings of the interviews were triangulated and the results were confirmed by the rapid review.[44]

Transferability

Due to the attainment of saturation, and the reflexive and collaborative analysis process, the findings of the qualitative component of this situational assessment are applicable to the rural areas of HPE and may be considered for other Ontario communities with similar demographics and older adult support service agencies.

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5. APPENDIX A – RAPID REVIEW EXTRACTION TABLES

Table 1: Data extraction: PA interventions for community dwelling older adults

Reference	Level of Evidence	Quality Rating	Population	Setting	Type of PA	Outcome	Intervention	Conclusions	Limitations
[18]	Summary	Strong	40-64, community-dwelling	Not specified	Leisure-time Exercise Utilitarian	Dementia, disability and frailty	Environmental	Improve environments where people live and work to encourage and enable everyone to build physical activity into their daily lives. This should include: Using new and existing traffic management and highway schemes to make walking and cycling safe and attractive options (see NICE's pathways on PA and the environment and walking and cycling). Improving the existing built environment, and designing new developments, to promote PA (see NICE's pathway on PA and the environment). Local authorities and third-sector organisations with a responsibility for, or who support, public health services should: Encourage both recreational activities and active travel (for example, walking, cycling) for local journeys. Provide supervised activities and exercise classes and an infrastructure to support walking and cycling. They should also maintain parks and open green spaces. The aim is to help people in mid-life to be physically active in different ways – and at different levels of intensity (see NICE's pathways on PA and walking and cycling).	

Table 1: Data extraction: PA interventions for community dwelling older adults									
Reference	**Level of Evidence**	**Quality Rating**	**Population**	**Setting**	**Type of PA**	**Outcome**	**Intervention**	**Conclusions**	**Limitations**
								Ensure that venues provide easily accessible information for visitors using forms of active travel, such as cycle parking locations and links to local online journey planners and mapping (See NICE's pathway on walking and cycling). Publicize these opportunities, including where they can be found and who to contact for more information	
[17]	Summary	Strong	65 and older	Not specified	Leisure-time Exercise	Mental Well-being	Individual or group programs	In collaboration with older people and their caregivers, offer tailored exercise and PA programmes in the community, focusing on: 1) a range of mixed exercise programs of moderate intensity 2) strength and resistance exercise, especially for frail older people toning and stretching exercise. Ensure that exercise programmes reflect the preferences of older people. Encourage older people to attend sessions at least once or twice a week by explaining the benefits of regular PA. Advise older people and their carers how to exercise safely for 30 minutes a day (which can be broken down into 10-minute bursts) on 5 days each week or more. Provide useful examples of activities in daily life that would help achieve this (for example, shopping, housework, gardening, cycling). Invite regular feedback from participants and use it to inform the	

Table 1: Data extraction: PA interventions for community dwelling older adults									
Reference	**Level of Evidence**	**Quality Rating**	**Population**	**Setting**	**Type of PA**	**Outcome**	**Intervention**	**Conclusions**	**Limitations**
								content of the service and to gauge levels of motivation.	
[21]	Synopsis of syntheses	Strong	55 and older, community-dwelling	Not specified	Leisure-time Exercise Utilitarian	PA	Individual or group programs	A variety of community-based interventions are effective at achieving short-term increases in PA, including group delivered, centre-based and theoretically underpinned behavioural and cognitive approaches. Tailored interventions may be effective for increasing PA compared to generic interventions. Conflicting evidence on mode of delivery of interventions, such as face-to-face, contact with professionals and non- face-to-face.	No long-term effects on PA activity reported. Short-term effects only reported. Heterogeneity of reported outcome measures, populations and settings made it difficult to extrapolate effectiveness and effect size.
[20]	Synopsis of syntheses	Strong	50 and older, community-dwelling	Not specified	Undefined	PA	Individual or group programs	Mode of delivery, setting and profession of the intervention provider are not necessarily associated with effectiveness, but client-centred, personalized interventions that start with professional tailored guidance then provide ongoing support lead to improved participation in PA. Effective intervention characteristics: Both multi-modal and single delivery mode of programs increase PA Neither delivery setting nor mode influences PA outcomes. The professional background of those who deliver programs does not influence outcomes. Type of PA offered does not influence effectiveness of the intervention, but walking based programs are common	

Table 1: Data extraction: PA interventions for community dwelling older adults									
Reference	**Level of Evidence**	**Quality Rating**	**Population**	**Setting**	**Type of PA**	**Outcome**	**Intervention**	**Conclusions**	**Limitations**
								due to universality and high acceptability of the program. Tailoring of interventions to participants needs is important for positive effects of programs Tailoring and individualization of programs is more beneficial when focused on environmental mediators rather than on psychosocial mediators alone. Effective intervention components: 1) Include more than purely cognitive increase of knowledge or purely behaviours change techniques (BCT) 2) Among BCTs, barrier identification and problems solving were consistent with positive outcomes. Effectiveness of prescribing, prompting practice, and providing information on consequences is uncertain.	
[24]	Systematic Review	Strong	Adults, community-dwelling	Rural	Leisure-time Exercise Utilitarian Sedentary behaviour	PA and sedentary behaviour	Individual or group programs	Overall, interventions were ineffective but studies using objective measures to assess PA outcomes demonstrated a strong outcome effect. However, due to the dearth of research in this area, clear guidance for practitioners and policy makers when designing public health programs and policies aimed at promotion active living in the rural setting is limited.	Included studies had a moderate to high risk of bias.
[30]	Systematic Review	Strong	50 and older, community-dwelling	Not specified	General PA health promotion	PA	Health promotion strategy	Although strategies for building community capacity for PA promotion are feasible and acceptable (Coalitions & Networks, training professionals,	Community capacity building is often carried out invisibly and subsumed under

Table 1: Data extraction: PA interventions for community dwelling older adults									
Reference	**Level of Evidence**	**Quality Rating**	**Population**	**Setting**	**Type of PA**	**Outcome**	**Intervention**	**Conclusions**	**Limitations**
								training laypersons, strengthening competence and awareness in target population, allocation of financial resources) there is insufficient evidence of its impact on PA outcomes due to the moderate to low quality of studies.	different concepts (e.g. empowerment). Review included Grey Literature which may have contributed to publication bias. Included studies were of low- to moderate-quality.
[36]	Systematic Review	Strong	45 and older, community dwelling	Not specified	Leisure-time Exercise	PA	Mall walking programs	Mall walking programs have the potential to increase PA among middle-age and older adults; however, the impact of these programs is unknown. Further research is needed to understand the barriers and facilitators of mall walking (e.g., built environment, equity, diverse communities).	The literature that is available is of low quality, thus more rigorous designs are needed.
[33]	Systematic Review	Strong	General population	Rural	Leisure-time Exercise Utilitarian	PA	Individual or group programs	Theory based PA interventions are mostly successful at increasing PA in rural populations.	Most studies included in the review had a high risk of bias, lack of objective measures of PA, inconsistent application of theoretical constructs, and construct measurement variability.
[38]	Systematic Review	Moderate	65 and older, community-dwelling	Rural	Exercise	PA	Individual or group programs	Characteristics of effective PA interventions in reviewed articles: 1) Delivered through personal contact 2) Low- to moderate- intensity 3) Offer variety in mode of activity 4) The	Inconsistencies in the dose of PA and outcome measures make it difficult to assimilate findings and

Table 1: Data extraction: PA interventions for community dwelling older adults									
Reference	**Level of Evidence**	**Quality Rating**	**Population**	**Setting**	**Type of PA**	**Outcome**	**Intervention**	**Conclusions**	**Limitations**
								findings do not support a specific strategy or set of strategies to adapt interventions to rural and regional settings but support the notion that community interventions have enhanced effectiveness when they are tailored and include personal contact.	differentiate the effectiveness of particular interventions.
[32]	Systematic Review	Moderate	60 and older, community-dwelling	Not specified	Active Aging (as defined by WHO)	Active Aging	Individual or group programs	Making older citizens co-producers of their health can enhance their satisfaction with life and their engagement in enactive, preventive and healthy behaviours, which is vital for achieving successful health outcomes and preventing waste of resources.[45]	Limited research on the effectiveness of holistic active aging interventions.
[34]	Systematic Review	Moderate	Adults, community dwelling	Rural	Leisure-time Exercise Utilitarian	PA	Individual or group programs	Interventions which are very personalized or tailored and/or include many intervention contacts appear to be most effective.	Small number of studies, mixed findings, risks of bias limit ability to draw firm conclusions.

Table 2. Data extraction: PA determinants of physical activity among community dwelling older adults									
Author	**Level of Evidence**	**Quality Rating**	**Population**	**Setting**	**Type of PA**	**Outcome**	**Determinant**	**Conclusions**	**Limitations**
[21]	Review of reviews	Strong	55 and older, community-dwelling	Not specified	Leisure-time Exercise Utilitarian	PA	Personal health practices Psychosocial Social environment Social-support Built Environment	**Individual Barriers**: Health status Previous PA habits & experience Cultural sensitivity Low self-efficacy Low perceived value of recreational PA vs purposeful PA Cost Poor awareness/access **Environmental Barriers**: Social environment such as crime, litter, noise. Physical environment such as access to facilities, safety of footpaths, and access and convenience to facilities **Individual Facilitators**: Enjoyable Health benefits Feeling ownership of interventions Tailored interventions **Social Facilitators**: Social contact Group, peer community support Support from instructor Convenient scheduling Referral from doctor Reasonable costs Transportation	No long-term effects on PA activity reported. Short-term effects only.
[19]	Review of reviews	Strong	Adults and older adults	Not specified	Leisure-time Exercise Utilitarian	PA	Built environment	Negative associations between PA and negative street characteristics, such as lighting and lack of sidewalks. Positive associations between active transport and street connectivity and	Variations across the research in populations studied, measurement techniques and PA outcomes assessed limited comparability of reviews.

Table 2. Data extraction: PA determinants of physical activity among community dwelling older adults									
Author	**Level of Evidence**	**Quality Rating**	**Population**	**Setting**	**Type of PA**	**Outcome**	**Determinant**	**Conclusions**	**Limitations**
								land use diversity, while street connectivity and availability/proximity to public transport system and land use mix was positively associated with general walking and cycling. Physical environmental determinants were more often associated with general walking and cycling in research than with active transport and recreational PA.	The majority of evidence is drawn from cross-sectional studies.
[22]	Review of reviews	Moderate	General population	Rural and remote	Undefined	PA	Built environment Social environment	Consistent positive associations were demonstrated by pleasant aesthetics and safety from crime as well as the presence of recreational facilities, trails and parks and PA. Some evidence of associations between PA and walkable communities, mixed findings for sidewalks, shoulders on road, traffic and street lighting. Identified barriers include lack of sidewalks, poor footpaths, uneven road surfaces, lighting, busy roads and safety concerns. Identified facilitators include accessible facilities, good walking conditions, public transportation, sidewalks, tracks, parks and trails.	Noted concerns among included reviews include use of cross-sectional designs, self-reported data, and small effect sizes.

Table 2. Data extraction: PA determinants of physical activity among community dwelling older adults									
Author	**Level of Evidence**	**Quality Rating**	**Population**	**Setting**	**Type of PA**	**Outcome**	**Determinant**	**Conclusions**	**Limitations**
[23]	Systematic Review	Strong	60 and older, community-dwelling	Not specified	Leisure-time Exercise Utilitarian	PA	Social support	Older adults with greater social support for PA are more likely to participate in Leisure-time PA, especially when it comes from family members.	High variability in measurement methods used to asses both social support and PA made it difficult to compare studies.
[29]	Systematic Review	Strong	65 and older, community-dwelling	Not specified	Leisure-time Exercise Utilitarian	PA	Built environment	There is very strong evidence supporting the benefits of neighbourhood walkability on total PA and walking. Safe, walkable and aesthetically pleasing neighbourhoods with specific services and destinations are positively influence older adult PA.	Limitations include not accounting for potentially correlated findings from the same article; an inability to account for potential moderating effects of neighbourhood size and definition; and using a meta-analytic method that relied on statistical significance rather than effect size estimates, and thus likely underestimating the evidence of environment-PA associations. English-only publications.
[31]	Systematic Review	Strong	55 and older, community dwelling	Not specified	Leisure-time PA (dancing, swimming) Exercise (aerobic, strengthening, flexibility) Utilitarian (household, transportation)	PA	Undetermined	Due to the limited number of manuscripts that assessed the determinants of PA, there is insufficient evidence for most associations between determinants and PA.	Publication bias, broad age range and excluding subsamples may have masked possible differences in determinants.

Table 2. Data extraction: PA determinants of physical activity among community dwelling older adults									
Author	**Level of Evidence**	**Quality Rating**	**Population**	**Setting**	**Type of PA**	**Outcome**	**Determinant**	**Conclusions**	**Limitations**
[26]	Systematic Review	Strong	50 and older, community dwelling	Not specified	Population level, universal PA interventions	Social inequalities	Health inequities	While there are some studies that measure the differential effects of PA interventions toward gender and age showing mixed results, there is insufficient evidence to draw firm conclusions regarding the impact of universal interventions on social inequalities.	Limited to English and German publications. Broad range of study designs means that not all studies included in the evidence Systematic Review were capable of examining true differential interventions effects. Subjective measures of PA
[25]	Systematic Review	Strong	65 and older, community dwelling	Not specified	Sedentary time (time watching tv, screen time, occupational sitting, motorized transport time)	Sedentary time	Personal factors (age, gender, marital and employment status, education, health) Social support Built environment	Personal factors that are associated with increased sedentary time: Living alone Poor health and well-being Lower educational attainment Not being employed full-time Lack of data on modifiable determinants other than personal factors. Data suggests possible associations of sedentary behaviour with transportation factors, type of housing, the presence of cultural facilities, perceived safety, or the availability of places to rest, and social isolation.	There is extremely limited causal evidence as the vast majority of information comes from quantitative cross-sectional studies.
[35]	Meta-Systematic Review of Qualitative Studies	Strong	65 and older, community dwelling	Not specified	Leisure-time Exercise	Perceptions of PA	Psychosocial Social support	To increase engagement, interventions should focus on PA as a fun, sociable, and achievable pastime for older adults with relevant short-term benefits.	Some studies gave vague methodological information. Most studies omitted socioeconomic status (SES) data and focused on organized gym or class-based PA available to higher SES individuals.
[46]	Systematic Review	Moderate	50 and older, community-dwelling	Rural	Exercise	Exercise	Personal health practices	Rural and remotely located people were more likely to identify social and environmental barriers to exercise.	

Table 2. Data extraction: PA determinants of physical activity among community dwelling older adults									
Author	**Level of Evidence**	**Quality Rating**	**Population**	**Setting**	**Type of PA**	**Outcome**	**Determinant**	**Conclusions**	**Limitations**
							Psychosocial Social environment	Social barriers such as lack of social support, commitments to work, family and community obligations that limit time for exercise, and physical environmental barriers (or lack of access to features such as facilities, programs, cost, transport) Personal factors such as health, motivation, time, self- efficacy were cited as barriers, and rural and remotely located people were less likely to cite previous exercise experiences as a barrier that in other settings.	
[28]	Systematic Review	Moderate	Adults, community-dwelling	Rural	Leisure-time Exercise Utilitarian	PA	Built environment Social environment	The elements of the environment that may be most relevant to rural areas include aesthetics, safety from crime, and presence of recreational facilities, trails and parks.	Cross-sectional studies limit definitive conclusions No consistent definition of rural communities. The majority of the studies focused on younger and middle age adults.
[37]	Systematic Review	Moderate	65 and older, community-dwelling	Not specified	Utilitarian	Mobility, quality of life	Built environment Social environment	The built and social environments both play a role in older adults' mobility, community engagement, and health. It may be an interaction between the person, the built environment, and elements of the social environment that encourage or dissuade an older adult to be physically active. **Street-level factors**: Condition of sidewalks Presence of street crossings **Community-level factors**:	Few studies address the complexity of community participation at the person, neighbourhood and societal levels.

Table 2. Data extraction: PA determinants of physical activity among community dwelling older adults									
Author	**Level of Evidence**	**Quality Rating**	**Population**	**Setting**	**Type of PA**	**Outcome**	**Determinant**	**Conclusions**	**Limitations**
								Neighbourhood walkability, connectivity, and destinations **Social environment**: Social interaction, sense of connectedness and belonging and sense of social disorder influence outdoor physical activities. Social reinforcement from friends and family.	

6. APPENDIX B - EVIDENCE SYNTHESIS TABLES

*Moderate Quality Rating **Strong Quality Rating

Table 3. Individual Determinants of PA			
Personal Barriers			
Cultural sensitivity Low perceived value of recreational PA vs. purposeful PA Cost Poor awareness/access	Summary		
	Review of reviews		21
	Systematic review		
Living alone Lower educational attainment Not being employed full-time	Summary		
	Review of reviews		
	Systematic review		25
Health status Low self-efficacy	Summary		
	Review of reviews		21
	Systematic review	27	25
Previous PA habits & experience, rural and remotely located people were less likely to cite previous exercise experiences as a barrier than people in other settings.	Summary		
	Review of reviews		
	Systematic review	27	
Personal Facilitators			
Enjoyable Health benefits Feeling ownership of interventions Tailored interventions	Summary		
	Review of reviews		21
	Systematic review		

Table 4. Interventions that Address the Individual Determinants of PA			
Determinant	**Level of Evidence**	**Rural Settings**	**General Settings**
Effective PA Programs			
Theory-based programs	Summary		
	Review of reviews		20,21
	Systematic review	33	
Theory-based programs are more effective when combined with environmental mediators rather than psychosocial mediators alone	Summary		
	Review of reviews		20
	Systematic review		
Tailored and/or personalized program to individual needs, personal preferences and characteristics (e.g., level of self-efficacy, age, cultural factors, interests)	Summary		17
	Review of reviews		20,21
	Systematic review	34,38	
Programs should be fun, enjoyable and achievable	Summary		
	Review of reviews		21
	Systematic review		35
Involve older adults in the design and delivery of programs, feeling a sense of ownership	Summary		17
	Review of reviews		20,21
	Systematic review		32
Mode of delivery, setting and intervention provider is not associated with increased effectiveness	Summary		
	Review of reviews		20,21
	Systematic review		

Table 4. Interventions that Address the Individual Determinants of PA			
Determinant	**Level of Evidence**	**Rural Settings**	**General Settings**
Walking based interventions are highly acceptable and effective	Summary		[17]
	Review of reviews		[20]
	Systematic review		[36]
Programs that include a variety of activities are effective at increasing PA	Summary		[17]
	Review of reviews		[20]
	Systematic review	[38]	
Delivery of programs is effective when they include personal contact and support from leader	Summary		
	Review of reviews		[21]
	Systematic review	[34,38]	
Encourage recreational physical activities and active travel behaviour	Summary		[18]
	Review of reviews		
	Systematic review		
Publicize opportunities for PA (active travel and recreation)	Summary		[18]
	Review of reviews		
	Systematic review		
Promote PA Guidelines for 65+	Summary		[17]
	Review of reviews		
	Systematic review		

Table 5. Environmental Determinants of PA			
Determinant	**Level of Evidence**	**Rural Settings**	**General Settings**
Interpersonal Environment			
Commitments to work, family, and community obligations that limit time for exercise.	Summary		
	Review of reviews		
	Systematic review	[27]	
Social support from peers and family, and social contact from programs is a facilitator for PA	Summary		
	Review of reviews		[21]
	Systematic review	[27]	[23] [37]
Social Community Environment			
Perceived safety from crime is a facilitator for PA, and is positively associated with increased PA	Summary		
	Review of reviews	[22]	[21,25]
	Systematic review	[28,37]	[37]
Physical Community Environment			
Walkability/Bikability (connectivity, land-use diversity, aesthetics, sidewalks, cycling infrastructure) is associated with increased walking and cycling PA for recreation and transportation	Summary		[18]
	Review of reviews	[22]	[19]
	Systematic review	[27,37*)] [28]	[25,29] [37]
Availability of programs is associated with increased PA	Summary		[18]
	Review of reviews		
	Systematic review	[27]	
	Summary		

Table 5. Environmental Determinants of PA			
Determinant	**Level of Evidence**	**Rural Settings**	**General Settings**
Availability of indoor facilities is associated with increased PA	Review of reviews	22	21
	Systematic review	27 28	
Availability of outdoor facilities (parks, trails and green spaces) is associated with increased PA.	Summary		
	Review of reviews	22	21
	Systematic review	27 28	

Table 6. Interventions that Address Environmental Determinants of PA			
Determinant	**Level of Evidence**	**Rural Settings**	**General Settings**
Interpersonal Environment			
Referral from Health Care Provider may be effective in increasing PA	Summary		[18] and refers to [47]
	Review of reviews		[21] Effectiveness of this is uncertain in [20]
	Systematic review		
Social Community Environment			
Ensure availability of Walking and PA programs	Summary		[17]
	Review of reviews		
	Systematic Review		
Physical Community Environment			
Provide infrastructure to support walking and cycling.	Summary		[18] and refers to [43]
	Review of reviews		
	Systematic Review		
Maintain parks and open spaces.	Summary		[18] and refers to [42]
	Review of reviews		
	Systematic Review		