



# **AgeTech Discussions: Exploring Perspectives on Technology**

Just Vertical | Workshop Report  
January 2023 | CTAAN-2022-003

**Report prepared by** (Authors listed alphabetically)  
Shannon Freeman, Emma Rossnagel

**Corresponding Author**

Please direct any inquiries about this report to:

**Dr. Shannon Freeman**

Academic Director, Centre for Technology Adoption for Aging in the North  
Associate Professor, School of Nursing, University of Northern British Columbia  
3333 University Way, Prince George, BC V2N 4Z9  
e-mail: [shannon.freeman@unbc.ca](mailto:shannon.freeman@unbc.ca)  
phone: 250-960-5154

**Acknowledgements**

This project was funded through NRC-IRAP with contributions from Just Vertical and conducted at the University of Northern British Columbia by the Centre for Technology Adoption for Aging in the North (CTAAN) team.

Workshop support was provided by Anam Liaquat and Ka Wai Tong.

Images and depictions of the Just Vertical Indoor Growing Units found in Figures 1a., 1b., and 5 were retrieved from the Just Vertical website: [www.justvertical.com](http://www.justvertical.com)

**Competing Interests of Authors**

The authors of this report as noted above have no conflicts of interest to declare.

**Publication Date**

January 5, 2023



# Executive Summary

Canada's population is aging faster than ever before and this has many implications in terms of healthcare, social services, and the economy. In response, AgeTech, or Age Technology, a subset of the health technology industry, has emerged in recent years and uses technology to support healthy aging by enhancing and adapting alternative care approaches. Yet, for many older adults, especially those living in northern and rural communities, there exists a disconnect preventing the emerging AgeTech from getting to those that need it the most. The Centre for Technology Adoption for Aging in the North (CTAAN) focuses on bridging that technology adoption gap by testing, piloting, adapting, and implementing new and existing technology solutions tailored to address the challenges experienced by older adults and care partners in northern and rural communities. One of CTAANs' key service is AgeTech Discussions: Exploring Perspectives on Technology, heretofore referred to as ADEPT. ADEPT workshops focus on emerging AgeTech to describe the applicability, usability, and feasibility of a featured AgeTech from end users' perspectives in northern and rural BC.

This report shares the results from ADEPT Workshops featuring Just Vertical Indoor Growing Units. Data collection occurred over two ADEPT Workshops with a total of 12 participants. Each workshop included pre- and post- online surveys, a demonstration of the Just Vertical Indoor Growing Units, and a facilitated discussion period where participants discussed the usability, feasibility, and accessibility of Just Vertical's Indoor Growing Units in northern and rural health care facility settings.

Participant findings from the workshops were analysed and six themes emerged which are described in this report. These themes include: 1) (Green) Thumbs up for Just Vertical Indoor Growing Units, 2) Indoor hydroponic gardening to support meaningful engagement & provide purpose, 3) Just Vertical Indoor Growing Unit implementation insights & impact, 4) Exploring applications of the Just Vertical Indoor Growing Units predicated on policy, 5) Understanding staff capacity to maintain Just Vertical Indoor Growing Units, 6) Addressing technology-based barriers in northern & rural BC healthcare facilities.

Theme one details how the design and functionality of Just Vertical Indoor Growing Units can benefit healthcare facilities in a northern and rural context. Theme two illustrates how Just Vertical Indoor Growing Units can promote meaningful and purposeful engagement through hydroponic indoor gardening. Theme three describes how successful implementation of the Just Vertical Indoor Growing Units in northern and rural healthcare facilities could be achieved and the impact on food availability, accessibility, variety, and cost. Theme four explores feasible applications of the Just Vertical Indoor Growing Units and highlights current and future long-term care hydroponic/indoor gardening policy. Theme five discusses current staff capacity at northern and rural healthcare facilities and how this may affect the maintenance of Just Vertical Indoor Growing Units. Theme six addresses perceived technology-based barriers to hydroponic gardening and ways to support interaction and sustain Just Vertical Indoor Growing Units in northern and rural healthcare facilities.

Primary recommendations include collaborating with healthcare facilities to co-develop simple and inclusive resources for the Just Vertical Indoor Growing Unit specific to northern and rural

communities, exploring ways to tailor the Just Vertical Indoor Growing Unit to improve accessibility and meet the diverse needs of residents/clients and staff in northern and rural healthcare facilities, and create informational videos and media for a northern and rural audience.

This report demonstrates Just Vertical Indoor Growing Units as a promising opportunity to improve quality of life, well-being, as well as food availability, accessibility, variety, and overall security for residents of northern and rural healthcare facilities in British Columbia.



# Contents

Executive Summary .....	<a href="#">Page 3</a>
Background .....	<a href="#">Page 6</a>
Methods .....	<a href="#">Page 9</a>
Workshop Findings .....	<a href="#">Page 11</a>
Participants & Pre-Survey.....	<a href="#">Page 11</a>
Facilitated Discussions: Key Themes .....	<a href="#">Page 12</a>
Theme 1: (Green) Thumbs up for Just Vertical Indoor Growing Units .....	<a href="#">Page 13</a>
Theme 2: Indoor hydroponic gardening to support meaningful engagement & provide purpose .....	<a href="#">Page 14</a>
Theme 3: Just Vertical Indoor Growing Unit implementation insights & impact..	<a href="#">Page 16</a>
Theme 4: Exploring applications of the Just Vertical Indoor Growing Units predicated on policy .....	<a href="#">Page 18</a>
Theme 5: Understanding staff capacity to maintain Just Vertical Indoor Growing Units .....	<a href="#">Page 20</a>
Theme 6: Addressing technology-based barriers in northern & rural BC healthcare facilities .....	<a href="#">Page 22</a>
Post-Survey .....	<a href="#">Page 23</a>
Recommendations .....	<a href="#">Page 25</a>
Conclusion .....	<a href="#">Page 26</a>

# Background

Although Canadians are living longer, they are also more likely to develop a chronic or life-limiting illness and have complex care needs as they age.<sup>1-2</sup> Consequently, increasing numbers of individuals are entering into long-term care facilities when personal and community supports are no longer able to provide a sufficient level of care.<sup>3</sup> Often, long-term care residents have limited to no access to activities they found meaningful prior to entry (such as gardening) and with less than 10% of residents displaying high social engagement in activities, few feel meaningfully engaged. Additionally, one in five long-term care residents experience depression and are at an increased risk of becoming socially isolated and lonely.<sup>4</sup>

Those with a life-limiting illness may receive end-of-life care in a range of settings including at home, in long-term care facilities, in hospital, and at in-patient hospice care facilities. Hospice palliative care is a philosophy of care that emphasizes relief from suffering and improving the quality of living and dying for individuals and their families.<sup>4</sup> This is realized through a wholistic approach to end-of-life care, which is a type of supportive, compassionate care that focusses on comfort, quality of life, respecting end-of-life decisions, family, and well-being.<sup>5</sup> Research has shown that a significant number of patients nearing end-of life, experience depression, as well as low social engagement.<sup>6</sup> Additionally, individuals receiving care from in-patient hospice facilities may experience pain, sadness, worry, and nervousness, which may impact overall well-being, end-of-life care, and the dying experience.<sup>7</sup>

With over 1,000 persons residing in long-term care facilities,<sup>5</sup> there is an immediate need to increase psychosocial and mental health supports. Further, roughly 10,000 clients a month are served in hospice palliative care/education programs in northern and rural British Columbia (BC)<sup>8</sup> that focus on quality end-of-life care and well-being. Growing evidence shows that exposure to nature and gardening, can improve life satisfaction and mental health in older adults. Additionally, gardening (and the resulting produce, herbs, flowers, etc.) can provide a sense of purpose and accomplishment, while improving self-esteem and reducing pain and stress.<sup>9-12</sup> A study led by CTAAN Academic Director Dr. Shannon Freeman looking at the co-design of an indoor gardening program in a long-term care facility in northern BC underscored the huge range of positive impacts indoor gardening had on residents and staff, while emphasizing the need to establish appropriate maintenance support programs.<sup>13</sup> Research has shown that nature-based and gardening interventions, such as indoor gardening activities, have potential to improve quality of life for those at end-of-life.<sup>14</sup> Further, incorporating nature into the built design of hospice facilities has been shown to be therapeutic and reduce stress for patients.<sup>15</sup>

Persons living in long-term care facilities and in hospice care facilities in northern and rural BC face increased barriers to spending time in nature and participating in gardening activities year-round. Along with limited resources, and geographical barriers, harsh weather conditions (especially during the long winter months which are cold and have diminished daylight hours) can restrict long-term care residents'/hospice clients' ability and desire to access gardens/greenery,<sup>15</sup> which may directly or indirectly impact quality of life and well-being.

In recent years, innovative solutions and technologies have begun to emerge from the AgeTech sector. AgeTech, or Age Technology, a subset of the health technology industry, uses technology to support healthy aging, and to support care partners and health professionals to improve quality of life for aging adults. By enhancing and adapting alternative care approaches through emerging technologies, it may be possible to enable and extend the ability for older adults to safely age in place within their own homes, improve long term care facility experiences, and/or decrease long-term care costs/needs.

The Centre for Technology Adoption for Aging in the North (CTAAN) supports aging in northern and rural communities by making Age Technologies more available to older adults, care partners, and the health care systems that support them. CTAAN's programs focus on testing, piloting, adapting, and implementing new and existing technology solutions tailored to address the challenges experienced by older adults and care partners in northern and rural communities.

CTAAN is built on a partnership with UNBC, the Northern Health Authority, and AGE-WELL. CTAAN has an extensive network of partners and "Living Lab" sites that allow for evaluation, testing, and validation in real-world settings. CTAAN leads testing, research projects, and evaluation to validate technology and works collaboratively with our partners to support implementation for at home settings and in care settings across the continuum of care. This information provides companies with important third-party validation that will not only provide key product insights but will allow the company to achieve a first sale or further reinforce a value proposition that will help the company scale in the region and far beyond. These services are provided by CTAAN staff including researchers, students, older adults, community partners, and healthcare providers.

The first step to introducing AgeTech to the region is one of CTAANs' key services, AgeTech Discussions: Exploring Perspectives on Technology, heretofore referred to as ADEPT, which focuses on emerging AgeTech in northern and rural BC to describe the applicability, usability, and feasibility of a featured AgeTech from end users' perspectives. Through workshops, end users participate in facilitated discussions and provide important insights and recommendations to inform design and adjustments of featured AgeTech. This process provides technology developers and companies with evidence that helps form the next steps to scale their products and services to northern and rural areas.

### *Feature Technology: Just Vertical Indoor Growing Units*

Just Vertical Indoor Growing Units - modern hydroponic gardening systems that sustainably grow plants indoors in vertical growing units and walls – are the focus of this report. Highlighted as easy to use, low maintenance, and sustainable, Just Vertical offers two Canadian made units: the AEVA and the EVE, as well as Growing Walls (see Figures 1a. & 1b.). These indoor gardening units can grow a large variety of plants including herbs, produce, and flowers, using peat moss plugs, and nutrient rich water solution. Established in 2017 with the vision of instilling positive environmental and social habits, while helping to eradicate food insecurity, Just Vertical facilitates year-round high yield growing opportunities for any level of gardening experience ([www.justvertical.com](http://www.justvertical.com)).



**Figure 1a.** The AEVA: A modern hydroponic garden system that grows up to 16 different large indoor plants and can grow up to 10lb of fresh produce.



**Figure 1b.** The EVE: A modern hydroponic vertical garden system that grows up to 12 different plants and designed to fit into the tiniest spaces, without compromising quality/efficiency.

In identifying the need to provide opportunities for healthcare facility residents/clients to meaningfully engage in purposeful activities, like gardening, northern and rural healthcare facility staff were recruited to engage in an ADEPT workshop on the feasibility and usability of implementing Just Vertical Indoor Growing Units in healthcare facilities throughout northern and rural British Columbia.

\*In Canada, the term 'northern' is commonly used in a provincial context to identify the northern and more sparsely populated (e.g., rural, remote) areas, which may experience arctic/subarctic climates, political marginalisation, economic dependency on natural resource development, and larger proportions of Indigenous populations.<sup>16</sup> There is much diversity across northern and rural communities based on socio-spatial characteristics (e.g., population size, population density), social representation, population demographics and resource availability.





# Methods

This report features Just Vertical's Indoor Growing Units – modern vertical hydroponic gardening systems that grow plants indoor year-round. Together, CTAAN and Just Vertical connected to explore potential collaborative projects with the primary goal of implementing Just Vertical Indoor Growing Units in healthcare facilities across northern and rural BC. To assess the feasibility and usability, CTAAN offered one of its key services: ADEPT (facilitated workshops supported by NRC-IRAP funding through CTAAN, and contributions from Just Vertical).

ADEPT workshop preparation began with a presentation of the Indoor Growing Units by Just Vertical to the UNBC research team. Through discussions, Just Vertical identified the need to better understand the user experience with hydroponic gardening, perceptions of the Just Vertical Indoor Growing Units, food supply, decisions, policies, and purchasing, and implementation feasibility and usability in a northern and rural healthcare facility context. With a key objective of exploring the “Feasibility and Usability of Just Vertical Indoor Growing Units to Support Healthcare Facilities in Northern and Rural British Columbia”, long-term care facilities and hospice were selected as prospective settings for implementation. Accordingly, staff from healthcare facilities fitting these designations were recruited for ADEPT Workshops. Additionally, we applied maximum variation sampling techniques to ensure diversity, equity, and inclusion in our recruitment. Data collection occurred in November 2022 over two workshops and the target number of participants was reached. Consent was obtained from all participants prior to the workshops.

Each workshop followed the same format: 1) a pre-workshop survey for participants to complete in the first 20 minutes; 2) the Just Vertical presentation with product demonstration; 3) a question and answer session with a company representative; 4) a facilitated group discussion; and finally, 5) a post-workshop survey to be completed at the end of the discussion. In the pre-survey, participants provided demographic information and answered questions about their experience with, and attitudes toward, hydroponic gardening technology and food accessibility. In the post-survey, participants shared further insight relating to the Indoor Growing Units and their satisfaction with the presentation/demonstration, general workshop facilitation, and organization.

Just Vertical presented on their two main Indoor Growing Units: the AEVA and the EVE, as well as their Growing Wall options. The set-up, maintenance, cost, benefits, and supports available to users were detailed and the AEVA was featured to demonstrate the maintenance cycle. The facilitated group discussions were led by trained CTAAN staff. A discussion guide was used to direct the conversations and focused on soliciting information around hydroponic gardening technology, Just Vertical Indoor Growing Units, northern and rural healthcare facility food/meal planning contexts, maintenance/human resources, implementation considerations, and required supports. Prompts used to elicit participant views and experiences were open-ended opinion and experienced-based questions. A back casting exercise was also conducted to gather further in-depth insights from participants.

Workshops lasted 2 hours each and were digitally recorded. Audio was transcribed verbatim and checked for accuracy. All identifying information was removed to ensure confidentiality.

Qualitative data was analyzed using a thematic approach guided by Braun and Clarke (2006). This involved following the six-phase process outlined using an inductive approach to code and generate themes:

- 1) Familiarisation with the data: Each transcript was read several times and initial thoughts noted to establish familiarity.
- 2) Coding: Concise initial descriptive codes were generated in a systematic manner and data relevant to each code was collated.
- 3) Searching for themes: A coding framework was developed by adding, removing, and organizing the initial codes into potential themes and sub-themes.
- 4) Reviewing themes: To maximize internal homogeneity and external heterogeneity, each theme was examined and refined in relation to the codes and in relation to the entire data set. A thematic map was used to help ensure the themes fits together meaningfully and the distinctions between them were clear.
- 5) Defining themes: The “essence” of each theme was identified and described clearly to determine the aspect of the data which each theme captured.
- 6) Producing the report: Extracts were knit together an analytical narrative with interview quotes integrated to contextualize the analysis in relation to the objectives of the research and to existing literature.

Quantitative survey data was summarized using descriptive statistics in Excel, while qualitative data was analyzed using NVivo 12. A consensus approach was applied to ensure the findings and illustrative quotes used in this report best represented the prevailing patterns across participants to provide thorough recommendations for the implementation of Just Vertical Indoor Growing Units across northern and rural BC healthcare facilities.

Ethics approval for the ADEPT workshops was provided by the University of Northern British Columbia ethics board (H22-00499), the Northern Health Operations Board (RRC-2022-004) and the National Research Council (2022-56).

# Workshop Findings

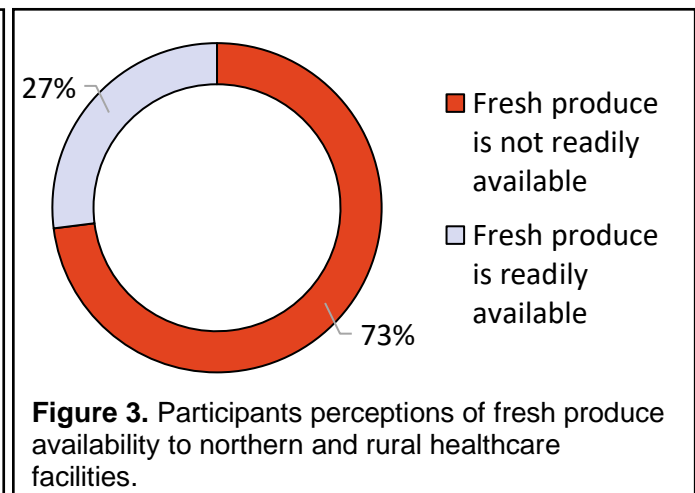
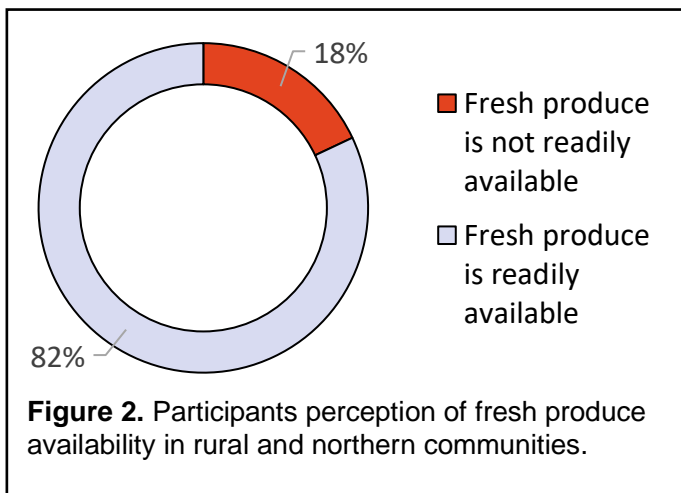
## PARTICIPANTS & PRE-SURVEY

Twelve participants took part in two ADEPT workshops held in November 2022. Participants were either employed or trainees in a variety of healthcare areas including dietetics, recreation therapy, nursing, operations, policy, and administration. Participant roles related to nutrition, long-term care, end-of-life care, recreation, policy, and planning.

Participants were motivated to attend the ADEPT workshop featuring Just Vertical Indoor Growing Units by a range of factors, including a desire to improve long-term care patient care and quality of life, work-related interests, to assess usability within long-term care settings, and in connection to policy development. In addition, participants were interested in learning about hydroponic gardening, benefits to long-term care residents and staff, care experience improvement, long-term care fit, and potential future benefits.

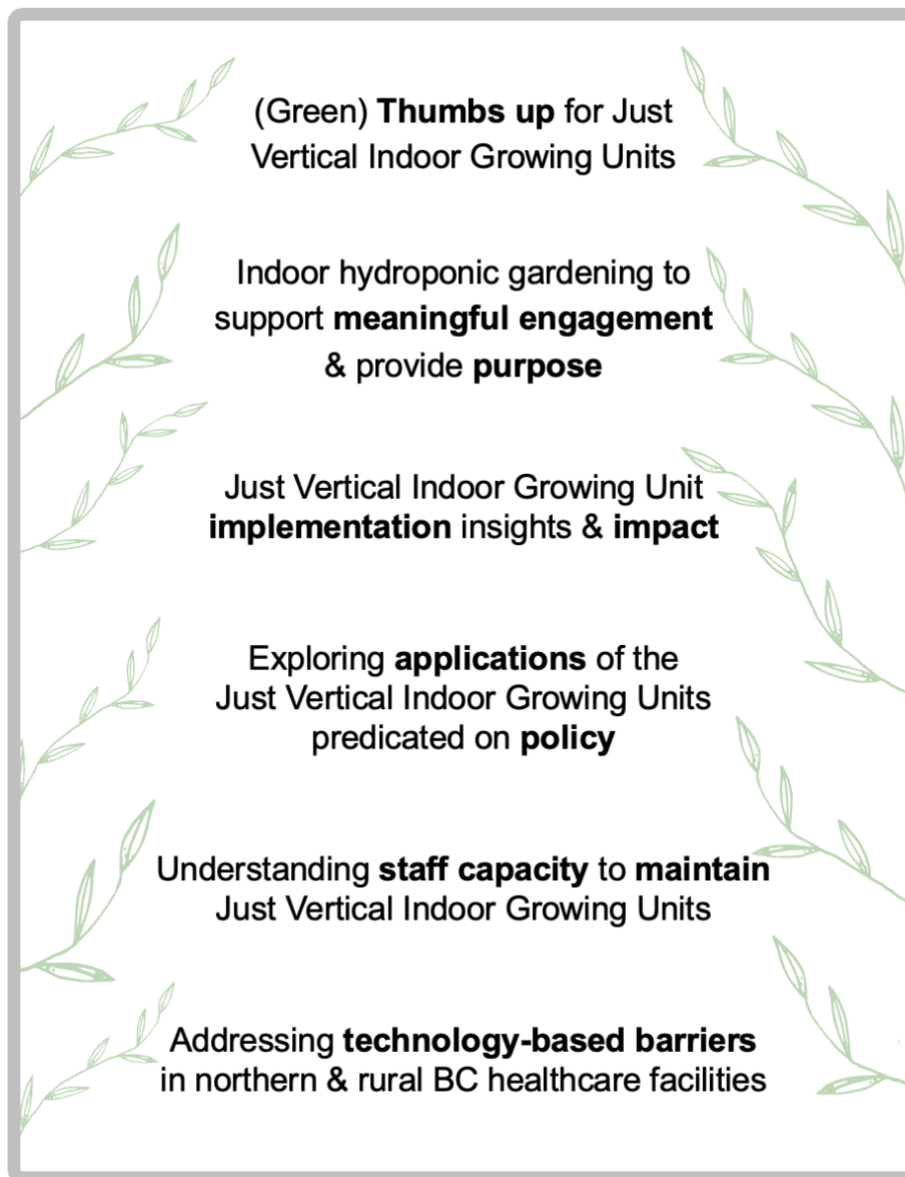
Most participants had never used hydroponic gardening technology prior to the workshop, and around half were not at all comfortable using this technology. Participants agreed that locally grown/ sourced and fresh food was important to both themselves and their clients. A majority of participants indicated that taste, quality, and freshness are the most important factors when purchasing food for healthcare facilities. Most participants felt that fresh produce is readily accessible to them, but not to their residents/clients in long-term care/hospice due to supplier limitations, food shortages, and high costs (see Figure 2. & Figure 3.). Most participants would choose fresh fruits and vegetables if they were available and accessible to their residents/clients, as well as locally grown products.

With regards to regular technology use, two-thirds of participants reported using Health Technology [e.g., Fitbit, Apple Watch] and Healthcare Provider Technology [e.g., Telehealth] in their daily life, and one-third of participants indicated using Assistive Technology [e.g., Mobility aids, Hearing aids] and Lifestyle & Communication Technologies [e.g., smartphone, tablet, computer]. Almost all participants indicated an increased use of technology during the COVID-19 pandemic and agreed that the need for support technology has increased for older adults since the beginning of the pandemic, stating the significant role of virtual-based technology in connecting with others during lockdowns.



## FACILITATED DISCUSSION: KEY THEMES

During the facilitated discussion, participants shared their insights of the Just Vertical Indoor Growing Units in relation to long-term care facilities, and hospice care settings in northern and rural communities in BC. Six key themes were developed through analysis of the workshop discussion: 1) (Green) Thumbs up for Just Vertical Indoor Growing Units, 2) Indoor hydroponic gardening to support meaningful engagement & provide purpose, 3) Just Vertical Growing Unit implementation insights & impact, 4) Exploring applications of the Just Vertical Indoor Growing Units predicated on policy, 5) Understanding staff capacity to maintain Just Vertical Indoor Growing Units, 6) Addressing technology-based barriers in northern & rural BC healthcare facilities (Figure 4.).



**Figure 4.** Key Themes Identified by ADEPT Workshop Participants.

## Setting the Scene

Participants described the current gardening activities in northern and rural healthcare facilities as generally outdoors with a limited growing season during the summer months. Outdoor gardens were used to grow produce for mealtimes at long-term care facilities, and flowers/greenery for decorative purposes at hospice. Indoor gardening is offered at some long-term care facilities in the colder months through supervised programming using gardening carts and only flowering/house plants are grown. In hospice, fresh flowers are donated and displayed almost daily, and any other indoor greenery is largely artificial (to minimize maintenance obligations).

### **THEME 1: (Green) Thumbs up for Just Vertical Indoor Growing Units**

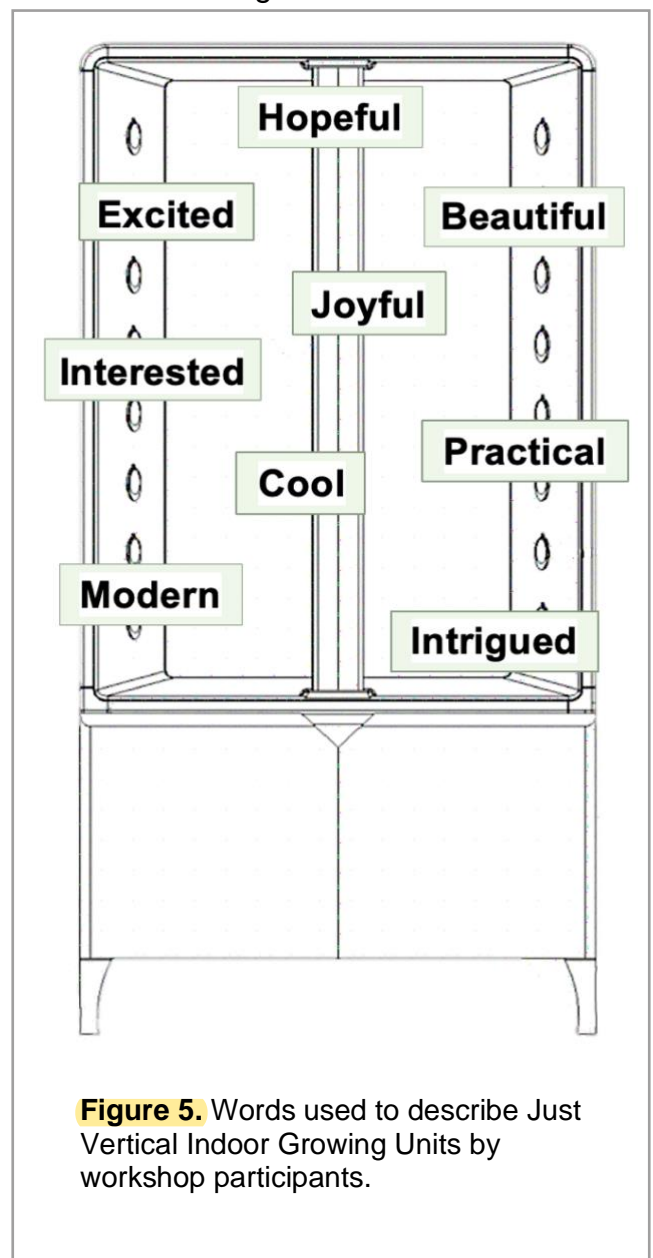
Participants strongly endorsed use of the Just Vertical Indoor Growing Units and identified significant potential for the Units to enhance the quality of life and wellbeing for individuals in long-term care homes and other healthcare facilities. When asked their first impressions, participants were “excited”, “interested”, “intrigued”, “hopeful”, and “joyful”, and in highlighting the aesthetics and design, felt that the Indoor Growing Units were “beautiful”, “modern”, “cool”, and “practical”.

“ I was really inspired. I thought it was a really space conscious design and pretty as well. ”

“ It makes me very hopeful for the future of urban agriculture – I’m excited about it. ”

“ I think it’s a very attractive unit. I think it would probably have a calming effect on somebody as well. ”

Participants characterized northern and rural BC as having long winter months with little vegetation or greenery, with harsh weather/freezing temperatures necessitating extended time indoors with limited to no direct sunlight. By having Just Vertical Indoor Growing Units in healthcare facilities in the north, participants saw huge benefit to residents/clients and family/friends having access and exposure to greenery, light, and fresh produce all year round.



**Figure 5.** Words used to describe Just Vertical Indoor Growing Units by workshop participants.

*I just think it would be really nice and inviting coming in and a sign of life just as soon as you come into long term care.*

*Typically, residents don't get out often during the winter months...so to have that light and access to fresh growth...would be beneficial for them.*

Participants suggested that staff would also benefit from having the Indoor Growing Units in their work environments.

**Table 1. Benefits of Just Vertical Indoor Growing Units**

Illustrative Quotes
<i>"Because it's the dead of winter, everybody's a little bit sun deprived, everybody's a little bit tired of the cold. Then everybody's just tired of seeing brown outside, right? So that is really nice, I think, for the staff as well as the residents, just to enjoy. I think that's really nice."</i>
<i>"I'm going to jump in and say that, assuming that this unit is in an easily accessible space, I can actually see the staff enjoying [the Just Vertical Indoor Growing Units] too."</i>

Similarly commonplace was the limited resources at hand in northern and rural BC. With the availability of the Just Vertical Indoor Growing Units, participants anticipated ample opportunity to bring indoor gardening/nature to healthcare facilities across the north.

*Otherwise, without a system like this, there's various sites that might want to have a garden, but just lack the space or the funding to have and [the Just Vertical Indoor Growing Unit] may allow that to be available."*

*"While [the Just Vertical Indoor Growing Units] maybe won't provide all the nourishment...at least being an option to bring it closer to residents and patients living across the north that are living in facilities."*

Altogether, Just Vertical Indoor Growing Units were well-liked by participants aesthetically, functionally, and with respect to the natural ambience and accessibility that could be provided to residents/clients, family/friends, and staff in a northern and rural BC healthcare facility context.

**THEME 2: Indoor hydroponic gardening to support meaningful engagement & provide purpose**

Participants described how the Just Vertical Indoor Growing units could be used to mitigate some of the challenges in supporting residents in long-term care facilities to participate in meaningful and purposeful activities.

Underlying overall quality of life, participants described how engaging in gardening or nature-based activities can improve the emotional and physical well-being of residents. In discussing prior long-term care indoor gardening programs, participants highlighted key aspects that were important to residents.

*Over the last few years planting seedlings and growing them with the residents – they obviously love the hand-on side of it.*

*Choosing the plants...planting them...if we end up with a viable plant that's a bonus but if we don't that's okay too.*

*When you're doing this from a recreation perspective it's the process that's involved – it really doesn't matter that you have an output that actually makes it into the kitchen...*

Participants viewed the Just Vertical Indoor Growing Unit as an opportunity to provide an inclusive and meaningful gardening/greenery experience to residents, explaining how, upon entering a long-term care facility, access to gardening or nature-based activities may be limited or not available. With a Just Vertical Indoor Growing Unit, participants described how residents, from those that are 'hands-on', to those that prefer passive interaction, could take part and benefit.

**Table 2. Just Vertical Indoor Growing Unit provide opportunity for engagement**

Illustrative Quotes	
Active Engagement	<i>“There’s a lot of pride that comes from [indoor gardening] and especially, from talking with residents, it sounds like a lot them grew up on land or farms or were just avid vegetable gardeners and then they come into care and there’s nothing really for them to do.”</i>
	<i>“We often have people that were active gardeners and really enjoy the outdoors. So having a piece of that in a setting where they may not be able to access it as readily as they had in their more active years.”</i>
Passive Engagement	<i>“So how it kind of structures people's day of going to visit their plant in the morning and see how it's doing and just kind of adding some interest and external stimulation and kind of support an interaction.”</i>
	<i>“But yeah, that’s always nice [for residents] just to see it—the items growing and the success coming from that.”</i>

Moreover, in contributing to facility meal planning, by growing produce, herbs, or plants, participants felt this would provide residents with a sense of purpose and inclusion and support mental health and well-being.

**Table 3. Just Vertical Indoor Growing Units provide a sense of purpose**

Illustrative Quotes
<i>“You’re growing something, you’re building something, you’re contributing to meals and your community. So, I think that is very empowering for a lot of people.”</i>
<i>“For residents to see staff coming to harvest their vegetables and bringing them back to the kitchen whole... where they can see that the garden and what they’ve cultivated is being cycled into their food.”</i>
<i>“I think it meets like a mental health need and a need for residents to be able to do something meaningful.”</i>

In reference to the Just Vertical demonstration video played in the presentation, participants were excited about how the Indoor Growing Units could facilitate activity and support social interaction with residents, family/friends, and staff.

*“ I thought that social piece is a really good point... [the Just Vertical Indoor Growing Unit] brings people out to the common area to socialize and start conversation and all that stuff.”*

*“ Having [indoor] gardens...it might be something the family or friends have to do with that person...then the family or friends have like a purpose —sometimes, I find they’re struggling to find something to do with their loved one, depending on what their ability is at the time.”*

*“ And I can see how... the visitors, how they’ll be having coffee in the dining room and how they’ll be interested and might strike up a conversation.”*

Overall, participants affirmed the Just Vertical Indoor Growing Units as an innovative opportunity for residents, family/friends, and staff to take part in indoor gardening activities, and promote meaningful and purposeful engagement and social interaction.

### **THEME 3: Just Vertical Indoor Growing Unit implementation insights & impact**

Participants were enthusiastic about the potential for Just Vertical Indoor Growing Units to be placed in northern and rural BC healthcare facilities and agreed that an effective implementation would be dependent on facility context and need full site support.

*“ It would really depend on the site and how it is overall meant to be used and what the plan is... [based on] the team or how the site is functioning.”*

*“ And so, there's a lot of different pieces [to implementation], but I wouldn't say as many barriers, especially if it's desired and is something that the site is passionate about...it's something that we've been working on over the last year to make it more achievable.”*

Further, participants highlighted how reflexivity and adaptability are key to successfully realizing a sustainable indoor gardening program with the Just Vertical Indoor Growing Units in



different facilities across northern and rural BC. While being pragmatic and responsive to resident/client and staff needs, participants also emphasized the need for ‘out of the box’ thinking.

**Table 4. Implementation across northern and rural BC**

Illustrative Quotes
<i>“If anything helps allow [Just Vertical Indoor Growing Units] to be available and used... part of [implementing] might be a trial and error to hear what staff have to say.”</i>
<i>“I feel there's opportunities in [Just Vertical Indoor Growing Units] that are so versatile, so if something does get set up - it doesn't have to be like that always...kind of keeping that flexible nature of the resource in mind when setting it up.”</i>
<i>“With that, I thought it's neat to kind of get that versatility and encourage creative thinking about ‘what could this be in our space?’ and how could it meet our needs as they change and evolve.”</i>
<i>“I like the initial comment about kind of starting small and growing bigger...like, baby steps toward success kind of thing...towards the bigger goal of impacting—like being a really practical source of food.”</i>

The potential for an accessible and sustainable food source was viewed as significant. In discussing food security in northern and rural BC communities, participants described a lack of fresh produce, little variety, and low quality, as well as prohibitive high costs, especially during winter months. Paired with these challenges, the food produced by the indoor growing units was discussed as having potential to greatly impact and improve northern and rural BC healthcare facility food operations.

**Table 5. Impact on food availability, variety, quality, and cost**

Illustrative Quotes
<i>“It's about us having some food security in the north and we have these units our staff can take care of.”</i>
<i>“That might be an opportunity to bring in something a little bit different that would not be available to our residents [in the north] otherwise.”</i>
<i>“[The Just Vertical Indoor Growing Unit] is good to supplement what we have. And we can play around with it a little bit... we'll get better quality food.”</i>
<i>That [the Just Vertical Indoor Growing Unit] would be especially relevant to like salad. I'm feeling like lettuce has really like become so expensive and kind of poor quality [in the north].”</i>

In sum, participants determined a successful implementation of Just Vertical Indoor Growing Units in northern and rural BC healthcare facilities would require full support and encompass flexible planning to adapt to the unique and changing needs of each site. With present food security challenges in northern and rural communities, participants conveyed the potential positive impact that the Just Vertical Indoor Growing Units could have on food obtainability, options, and cost.

#### **THEME 4: Exploring applications of the Just Vertical Indoor Growing Units predicated on policy**

In picturing Just Vertical Indoor Growing Units in northern and rural BC healthcare facilities, participants examined feasible applications within current long-term care indoor/hydroponic gardening policy.

Participants highlighted two valuable uses of the Indoor Growing Units: a) for recreational purposes, or b) for food production purposes and discussed the associated challenges related to a healthcare facility setting.

*[The Just Vertical Indoor Growing Unit] is great from a recreation perspective, but this is setting alarm bells from a kitchen perspective, where I cannot plan the menu and then, granted the growing cycle might be a matter of weeks, but I'm still depending on this produce.*

*So, do you get one of those units and not necessarily bank on the produce that you produce? But, you know, that feels counterintuitive too that's you're going to grow stuff and not necessarily use it.*

Based on these concerns, participants suggested implementing two Just Vertical Indoor Growing Units, one for recreation and one for food production, or adapt use of one unit as needed.

**Table 6. Adapting applications of Just Vertical Indoor Growing Units**

Illustrative Quotes
<i>"I was just thinking if it would be even beneficial just over the winter months. Like if we looked from October to March right? And then...looking from recreation side of things, come the end of March/April we're plunking seeds, we're getting ready for the gardens, we're getting outside as much as we can with residents once the weather gets nicer."</i>
<i>"So, in the summer the needs for produce to supplement food would not be as necessary, because they would be replaced by outdoor gardens. In the summer, you might want to do something more like recreation focused, like who can grow the biggest flower or something, some kind of healthy competition. I feel like it doesn't have to serve the same purpose all year round."</i>

In reflecting on current indoor/hydroponic gardening policies, participants raised concern around food safety and the accessibility of the plants grown in the Just Vertical Indoor Growing Units in long-term care facilities.

*We'd have to be very specific in where we would place it... I would be concerned about people just touching it... from an infection control perspective, whether or not you would actually be able to eat the produce.*

*Yeah, and so for any food grown to be used in the kitchen...if it's an indoor thing it can't be in living rooms, dining rooms, or any communal spaces that residents are always there on a regular basis. So that is a huge limitation to that.*

Participants pitched ways to optimize engagement with residents and family/friends, while still adhering to current long-term care indoor/hydroponic gardening policy and food safety guidelines. Limiting physical access, either with barriers or modifying the unit to have wheels, or ensuring proper sanitation practices were in place, could facilitate interaction and engagement for residents and family/friends with the vegetation grown in the Just Vertical Indoor Growing Units.

**Table 7. Facilitating interaction with Just Vertical Indoor Growing Units**

Illustrative Quotes	
Limiting physical access	<i>"[If] it was blocked off with baby gates at the end of one of the wings or something you know where they could just look at it but not touch."</i>
	<i>"I'm almost thinking like the festival of trees. You got a tree and then you got stanchions around kind of [blocking] people off, so they're not hands on touching the tree. But I don't know again that when staff aren't around to see, you know, are those stanchions moved? And I don't know if we can still guarantee that it's not touched and what not when we're not there, right?"</i>
	<i>"One thing that I was just thinking about — if [the indoor growing unit] was portable. You could actually roll it to somewhere and then put it somewhere that was easily accessible."</i>
Sanitization protocols	<i>"As long as resident's hands are sanitized and they have an option of wearing gloves or not, but their hands have to be sanitized, [then] they can touch the plants."</i>

Centred on current policy limitations and the growing interest in and evidenced benefits of indoor gardening, participants reported the development of new policy aimed at making indoor/hydroponic gardening more accessible and attainable for long-term care facilities.

**Table 8. New policy developments in northern and rural BC healthcare facilities**

Illustrative Quotes
<i>"Fortunately, we are working on it so that policy would not be a barrier. The new policy does involve a lot of different stakeholders, and a lot of different parts of the organization to make sure it's safe."</i>
<i>"I would obviously love as many of them as possible! A whole wall, a whole commercial unit at all the sites, but yeah obviously we need way more players to make [policy] decisions."</i>

Participants explained that the new policy was grounded in previous learnings from experience with a long-term care hydroponic gardening tower project. After viewing the Just Vertical Indoor Growing Units, participants detailed how the unit's design and function were in alignment with the policy updates.

*"The system looked a lot more contained [than expected]. A lot of the infection issues that the tower hydroponic systems could have and what we learned — we are developing a policy — and in terms of allowing it to come into site with residents, it looks like it has the option to be a very safe product."*

*“ And also, all the infection pieces, because I had some components brought up for our policy, so, [after seeing the unit] a lot of the [existing limitations] would be mitigated and reduced to make the indoor garden available in our facilities. ”*

In summary, participants discussed feasible applications, and potential policy limitations, of implementing Just Vertical Indoor Growing Units in long-term care facilities across northern and rural BC. Highlights of an updated indoor/hydroponic policy were shared in relation to the Just Vertical Indoor Growing Unit’s design, function, and safety features.

**THEME 5: Discerning staff capacity to maintain Just Vertical Indoor Growing Units**

Participants reported that the Just Vertical Indoor Growing Units looked relatively easy to maintain but emphasized that for these units to be a viable indoor gardening option in healthcare facilities, continued and reliable care would be necessary. Previous indoor gardening experiences, along with staffing challenges, had participants somewhat apprehensive of ensuring consistent maintenance of the Just Vertical Indoor Growing Units.

*“ In long-term care we are facing staff shortages in recreation often...while we might have nurses and care staff on site every day, but they are also constantly short [staffed]. ”*

*“ There’s just so much staff turnover. So, even if you might get buy in from staff today... they bid on a different position a couple of months from now... constantly trying to recruit and who is it going to fall down to. ”*

*“ I’m a little afraid of the maintenance side of it...just looking at other roles that have to happen in the [healthcare facilities] and who it falls on - that might be hard to recruit consistent people to get that done ”*

Participants proposed a variety of ways that the Just Vertical Indoor Growing Units could be maintained, while minimizing additional work for staff.

**Table 9. Maintenance of Just Vertical Indoor Growing Units**

Illustrative Quotes
<i>“I like the idea of having two champions, so when one person can’t do it, another person can.”</i>
<i>“Having like a club or something built around taking care of [the Just Vertical Indoor Growing Unit]. Whether it’s like a few people...or bigger, and they rotate days doing the harvesting and the care for it.”</i>
<i>“I’d be advocating for student volunteers—probably from the university or college. So, potentially that could offload the work from the staff as long as volunteers are able to come into the home.”</i>

Throughout the discussion, participants emphasized the need for multiple persons to care for the unit to guarantee consistent care. Sharing this responsibility collaboratively, along with being dependable and resourceful were believed to be important characteristics of effective champions/volunteers.

*“I think the champions need to be really organized. We don’t have chemicals; we don’t know where to get chemicals. We’re going to stop using it in a year or whatever when the supplies run out.”*

*“I feel like it doesn’t have to serve the same purpose all year round... or be led by the same group all year round. But I still think you would have to have some champions that see those possibilities and lead those opportunities.”*

While participants offered a variety of ways that the Just Vertical Indoor Growing Units could be maintained and supported without staff, they also described the real-life challenges faced in healthcare facility settings and acknowledged that the successful care and maintenance of a unit would ultimately still be the responsibility of staff.

**Table 10. Staff responsible for Just Vertical Indoor Growing Unit maintenance**

Illustrative Quotes
<i>“It’s nice to get key residents involved you know to take it on, but where we work it’s hard without reminders and assistance by staff.”</i>
<i>“I don’t see it as being something you could completely hand over to a volunteer. I think it would still have to have a very strong staff presence in maintaining [the unit].”</i>
<i>“And that’s the other thing, you get a champion resident and then you know they decline, right? And then you don’t have that person anymore. I personally think it would fall onto the staff.”</i>

Relating stories of unsuccessful indoor gardening attempts in long-term care, participants discussed that central to these narratives were maintenance errors, such as forgetting to water, forgetting to add nutrients, over-watering, or under-watering. To support the timely and safe upkeep of the Just Vertical Indoor Growing Units, participants shared technology-based ideas

*“So, if it had a red light on it would tell you that there’s something that needed to be done, because I just know, especially in long-term care, everybody’s super busy.”*

*“I’d like to see another version of this, to be honest with you, with some kind of a display on it...I think that would make it a little bit more user-friendly.”*

*“For long-term care and people with different ability levels - having a remote control. Obviously, it is already very user-friendly, but if it were something that people can control certain pieces with the remote—like the light—if they were in their room, that kind of thing.”*

“ Making sure that whatever type of water can be used in the system...perhaps that would be for an app, or resource guide, in what to do or how to trouble shoot. So just some of that education material or resources...that would be helpful for northern settings. ”

Overall, participants shared concerns over the maintenance of the Just Vertical Indoor Growing Unit in healthcare facilities citing staff shortages, turnover, and high workloads as barriers. While staff oversight would be necessary, participants proposed recruiting champions/volunteers to care for the unit and suggested some technology-based adaptations to alleviate potential maintenance challenges.

**THEME 6: Addressing technology-based barriers in northern & rural BC healthcare facilities**

In discussing fit of the Just Vertical Indoor Growing Units with existing gardening activities in healthcare facilities, participants expressed that unfamiliarity or uncertainty of hydroponic gardening technology may be a possible barrier to use for residents/clients.

**Table 11. Hydroponic gardening familiarity to residents/clients**

Illustrative Quotes
<i>“I was just thinking about the familiarity for [residents]. Like this would be totally unfamiliar – they’re used to going out to their garden, right?... I just think they would be totally shocked at what’s happening.”</i>
<i>“I think that it’s kind of unfamiliar territory because it’s hydroponic system, it’s not ‘In the ground gardening.’”</i>

Commenting that fear of learning new technology may impact use for both residents/clients and staff, participants underscored the need for hands-on experience and community connection to improve engagement and sustainability.

“ So, we have [staff] that are scared of technology here. So, I think, like one month or say, a couple weeks someone looks after it, and then another person. Like have [the champion] look after it, and make sure everything’s working well, but have people looking after it every week so they’re not scared. ”

“ Having these programs and getting [residents and staff] using the equipment more engaged. Especially if [they] might be more intimidated by new technology, I think [programs] will increase the sustainability because the less intimidation there is around the equipment, the more it will get used and then the more output in terms of food and the more sustainable it will be. ”

“ Maybe to bring down that kind of intimidation, if there was acknowledgment across different sites that were using it – like some kind of community of practice... just that idea that other sites are using theirs in this way and we can do it that way too. ”

Additionally, participants discussed the importance of education in decreasing the perceived barriers and suggested that training tools should be brief and informational.

**Table 12. Education and training for Just Vertical Indoor Growing Units**

Illustrative Quotes
<i>“So, people might not want to learn, I think there’s kind of like a perceived barrier to learning, but I don’t think there’s actually a large barrier – I think it’s just a little bit of education that would be needed.”</i>
<i>“I think it really is you get out what you get in. And how much education and care there is around the device. So, I think a lot of it comes down to people being educated in how it works and motivated to use it.”</i>
<i>“I like things that are really efficient...like quick start guide. It’s one page—if my questions not answered there’s a FAQ page. But I’m not going to looking through something big.”</i>

Rounding out the conversation, participants discussed ways in which to support sustainability and motivate residents/clients and staff to garden using Just Vertical Indoor Growing Units.

*“ And tips and tricks kind of from [other] users to keep that momentum going and also celebrate. I think celebration is a big part of sustainability. ”*

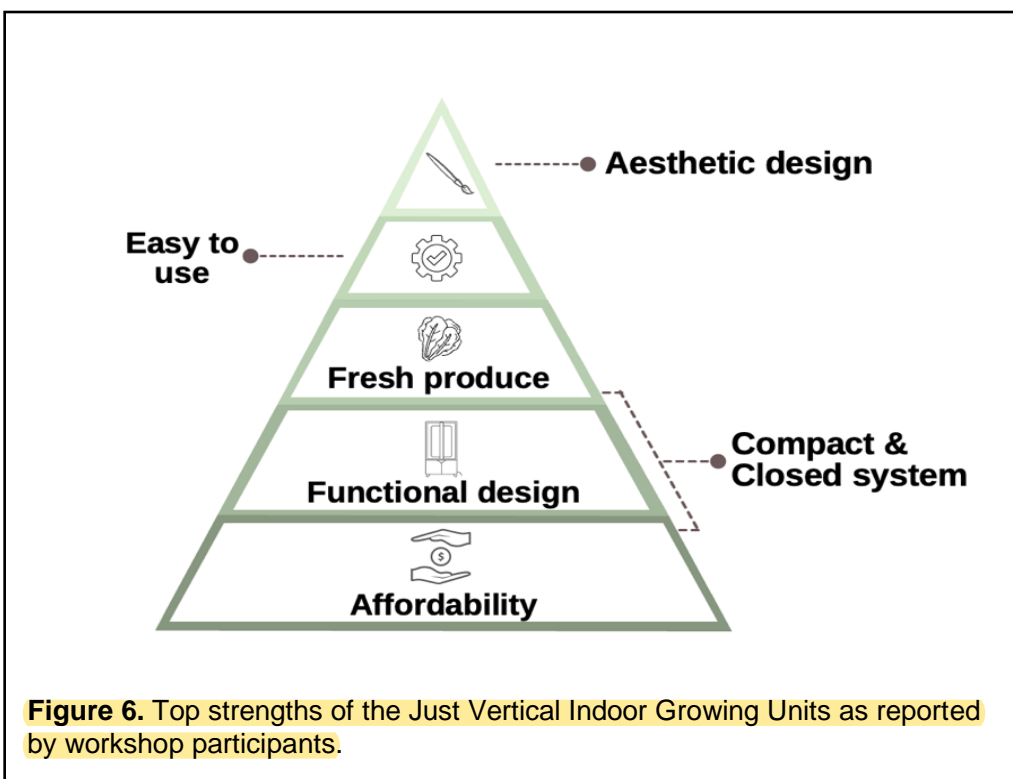
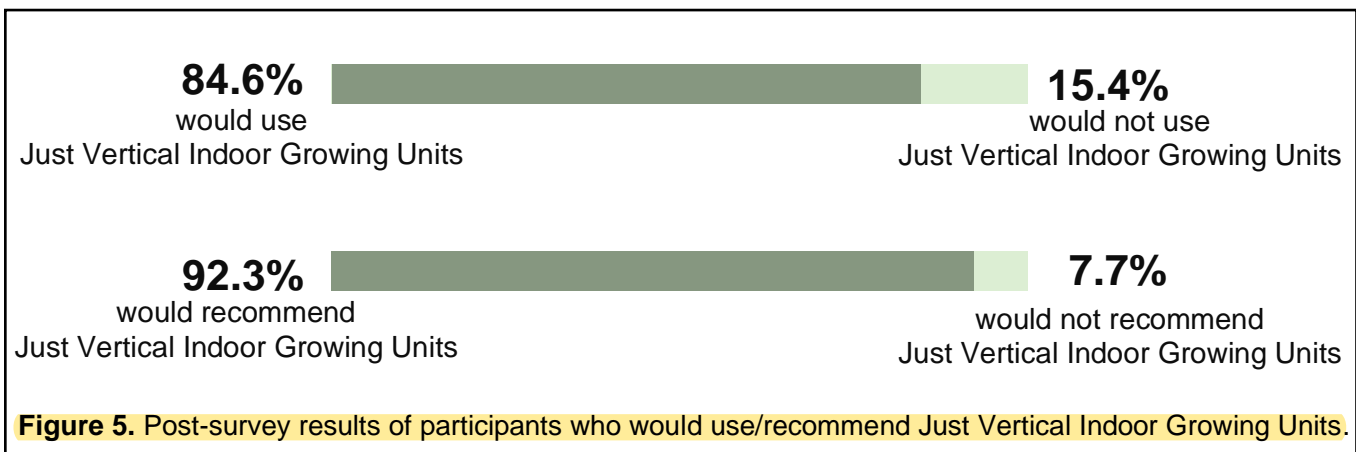
*“ But if there was some kind of acknowledgment of cool things that were grown [across other sites], and to keep the hype going and enthusiasm. ”*

Addressing perceived technology-based barriers, participants emphasized the need for hands-on interaction, community, education, and celebration of hydroponic indoor gardening to support and sustain Just Vertical Indoor Growing Units in northern and rural healthcare facilities.

## POST-SURVEY

Altogether, participants described the workshop as interactive, informative, engaging, with room for open discussion and plenty of opportunity for questions. Most participants could see themselves directly, or indirectly, using Just Vertical Indoor Growing Units, either personally or professionally. A majority of participants reported that they would recommend Just Vertical Indoor Growing Units to others, suggesting optimal implementation sites to be long-term care facilities, as well as hospice, offices, and schools (see Figure 5.).

Participants listed that the top strengths of the Just Vertical Indoor Growing Units were the aesthetics, ease of use, and the fresh food produced all year. Additionally, participants indicated the small space requirement, low infection risk because of the closed water system, and affordability were also high points of the Indoor Growing Units (see Figure 6.).







# Recommendations

The following are a list of recommendations based on the findings of this report for supporting implementation of Just Vertical Indoor Growing Units in northern and rural healthcare facilities:

- Explore co-development of a scheduling resource, like a simple app or added display/light, for use by facility staff to indicate when maintenance is needed
- Develop communication resources to streamline and support efficient maintenance
- Consult with healthcare facility staff to adapt the Just Vertical Indoor Growing Unit to be more accessible for older adults and users with functional and/or cognitive challenges – brainstorm ways to maximize engagement but minimize unwanted access. For example, considerations could include:
  - o Introduction of a remote communication device to inform maintenance is required
  - o Reconfiguration to be lower to the ground or height adjustable for wheelchair users
  - o Inclusion of a remote control to adjust lights, timer, etc.
  - o Introduction of a portable option to allow isolated or residents in less accessible areas be involved
  - o Video recording linked to an app for people to be able to watch plants growing from a remote location (e.g., could watch from their room or family care partners could watch from off-site)
- Collaborate to create relevant, easily accessible training such as easy growing guides hosted on a publicly available YouTube channel
- Develop a resource guide with tips and tricks, theme ideas, troubleshooting, specific northern/rural considerations, recipes, social connection ideas, “Did you know?” conversation starters, programming ideas, and ways to interact
- Consider creating a video demonstrating the benefits of hydroponic gardening specific to a northern and rural setting
- Collaborate with facilities to ensure design meets policy needs
- Potential to develop and offer 1 year, 2 years, etc., planning guides or programs for seedlings/nutrients for scheduled product delivery to reduce workload

## NEXT STEPS

- Report findings will inform the development of a staff workload study of Just Vertical Indoor Growing Units deployed at the PGHPCS launching in January 2023
- During the study, the amount of staff time, resources, and efforts necessary to safely maintain and support the Just Vertical Indoor Growing Unit in an on-site hospice residential care facility will be evaluated
- Report findings will also be used to facilitate the exploration of community specific Just Vertical Indoor Growing Unit programming to support care partner wellness

## Conclusion

This report presented the perspectives of northern and rural healthcare facility staff who participated in ADEPT Workshops featuring Just Vertical Indoor Growing Units in November 2022. Through qualitative analysis of the facilitated workshop discussions, six themes were developed and included: 1) (Green) Thumbs up for Just Vertical Indoor Growing Units, 2) Indoor hydroponic gardening to support meaningful engagement & provide purpose, 3) Just Vertical Indoor Growing Unit implementation insights & impact, 4) Exploring applications of the Just Vertical Indoor Growing Units predicated on policy, 5) Understanding staff capacity to maintain Just Vertical Indoor Growing Units, 6) Addressing technology-based barriers in northern & rural BC healthcare facilities. Primary recommendations included collaborating with northern and rural healthcare facilities to co-develop simple and inclusive northern-specific resources for the Just Vertical Indoor Growing Unit, explore ways to tailor the Just Vertical Indoor Growing Unit to improve accessibility and meet the needs of residents/clients and staff in northern and rural healthcare facilities, and create informational videos and media for a northern and rural audience.

Altogether, the findings drawn from this report demonstrate Just Vertical Indoor Growing Units as a promising opportunity to improve quality of life, well-being, as well as food availability, accessibility, variety, and overall security for residents of northern and rural healthcare facilities in British Columbia.



# References

1. Freeman S, Armstrong JJ, Tyas SL, Neufeld E. Clinical characteristics and patterns of health deficits of centenarians receiving home care and long-term care services. *Experimental Gerontology*. 2017; 99:46–52. <https://doi.org/10.1016/j.exger.2017.09.010>
2. Kone AP, Mondor L, Maxwell C, Kabir US, Rosella LC, Wodchis WP. Rising burden of multimorbidity and related socio-demographic factors: a repeated cross-sectional study of Ontarians. *Can J Public Health*. 2021;112(4):737–47. <https://doi.org/10.17269/s41997-021-00474-y>
3. Freeman S, Bishop K, Spirgiene L, Koopmans E, Botelho FC, Fyfe T, et al. Factors affecting residents transition from long term care facilities to the community: a scoping review. *BMC Health Serv Res*. 2017;17(1):689. <https://doi.org/10.1186/s12913-017-2571-y>
4. Freeman, S. (2017). Caring for older adults in their preferred location of care: An intervention study to support safe transition for residents from long term care back to rural and remote northern communities. An update on findings from phase 1 report
5. Hoben M, Heninger A, Holroyd-Leduc J, Knopp-Sihota J, Estabrooks C, Goodarzi Z. Depressive symptoms in long term care facilities in Western Canada: a cross sectional study. *BMC Geriatr*. 2019;19(1):335. <https://doi.org/10.1186/s12877-019-1298-5>
6. Xiong B, Freeman S, Banner D, Spirgiene L. Hospice use and one-year survivorship of residents in long-term care facilities in Canada: a cohort study. *BMC Palliative Care*. 2019 Dec;18(1):1-8.
7. Kutner JS, Kassner CT, Nowels DE. Symptom Burden at the End of Life. *Journal of Pain and Symptom Management*. 2001;21(6):473–80. [https://doi.org/10.1016/S0885-3924\(01\)00281-0](https://doi.org/10.1016/S0885-3924(01)00281-0)
8. Hospice care in British Columbia - bc-cpc.ca [Internet]. [cited 2023Jan4]. Available from: <https://bc-cpc.ca/wp-content/uploads/2020/05/20191031-PC-Current-State-Report-Website.pdf>
9. Wang D, MacMillan T. The benefits of gardening for older adults: a systematic review of the literature. *Act Adaptation Aging*. 2013;37(2):153-81. <https://doi.org/10.1080/01924788.2013.78494>
10. Detweiler MB, Sharma T, Detweiler JG, Murphy PF, Lane S, Carman J, et al. What Is the Evidence to Support the Use of Therapeutic Gardens for the Elderly? *Psychiatry Investig*. 2012;9(2):100. <https://doi.org/10.4306/pi.2012.9.2.100>
11. Barnicle T, Midden KS. The Effects of a Horticulture Activity Program on the Psychological Well-being of Older People in a Long-term Care Facility. *horttech*. 2003;13(1):81–5. <https://doi.org/10.21273/HORTTECH.13.1.0081>
12. Chen TY, Janke MC. Gardening as a Potential Activity to Reduce Falls in Older Adults. *Journal of Aging and Physical Activity*. 2012 Jan;20(1):15–31. <https://doi.org/10.1123/japa.20.1.15>
13. Freeman S, Banner D, Labron M, Betkus G, Wood T, Branco E, Skinner K. " I see beauty, I see art, I see design, I see love." Findings from a resident-driven, co-designed gardening program in a long-term care facility. *Health Promotion & Chronic Disease Prevention in Canada: Research, Policy & Practice*. 2022 Jul 1;42(7).

14. Wallis J, Lenon R. **P-46** "Sow and grow", nature that nurtures: horticultural therapy as part of end-of-life care. In: Creative Arts, Therapies and Wellbeing [Internet]. British Medical Journal Publishing Group; 2016 [cited 2023 Jan 4]. p. A25.2-A25. Available from: <https://spcare.bmj.com/lookup/doi/10.1136/bmjspcare-2016-001245.70>
15. Cohen SR, Leis A. What Determines the Quality of Life of Terminally Ill Cancer Patients from Their Own Perspective? *J Palliat Care*. 2002;18(1):48–58.
16. Middleton LE, Koch M, Freeman S, et al. Using participatory research to co-create the dementia-inclusive choices for exercise toolkit. *Alzheimer's & Dementia*. 2021;17(S7). doi:10.1002/alz.053215

