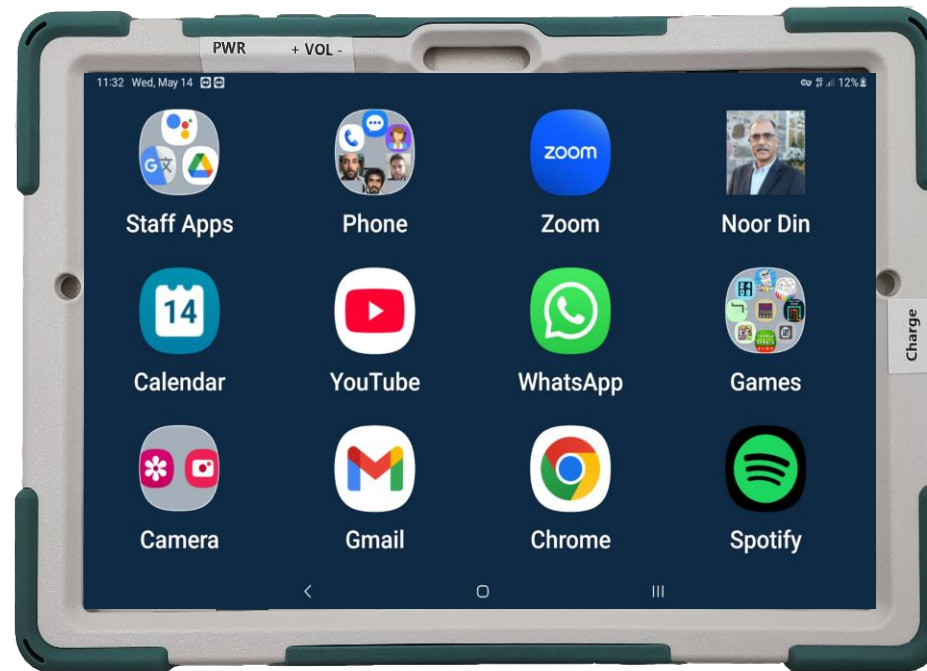


Tech-empowered Healthy Living for Older Adults Living with Dementia or Memory Issues



Optimal Aging Conference
May 15-16, 2025, University of Louisville, Kentucky, USA

Human Endeavour (A Canadian charitable organization)
Noor Din (Founder & CEO) & Dr. Lois Kamenitz PhD (York University)

- Three distinct societal developments
- About Human Endeavour (www.humanendeavour.org)
- Tech-Empowered Healthy Living for Seniors With Dementia (TEHL Project)
- Impact Evaluation Study (a.k.a. Intervention Research)
- Findings (Managers, Carers, and Seniors)
- Recommendations
- Next Steps - Gen 4 and relevance to Gen 3

- Q & A (15 minutes)

Agenda

Three distinct societal developments: 1) the greying of the population, 2) increased use of technology, and 3) a projected increase in dementia cases.

1. The demographics of Canada are shifting. According to an Employment and Social Development Report (2021), women and men aged 65 years and older surpassed the number of children aged 0 to 14 years.

The greying of Canada's population, a shift that became apparent in the early 2000s, has implications for the provision of services for older adults, with research supporting the desire to age in place.

In Canada, 93.2% of older adults opt to live in private dwellings (house, apartment or moveable dwelling) while just 6.8% live in collective dwellings such as residences for senior citizens, long-term care facilities or health care related facilities.

Three Distinct Societal Developments

2. The increased use of technology is the second development. The “harmonization” of these two distinct developments, the greying of the population and the growth of technology, created **Gerontechnology**, which emerged in the 1990s and highlights the interplay between these two significant developments.

3. And third, between April 2022 and March 2023, the Public Health Agency of Canada (PHAC) reported nearly 487,000 individuals aged 65 and older living with a diagnosed case of dementia, with approximately 99,000 new diagnoses in the same age group. These statistics reflect only those who have been formally diagnosed by a healthcare professional, suggesting the actual number may be higher.

With nearly all seniors opting to stay in their homes and communities, the Canadian Government, through the Public Health Agency of Canada (PHAC), has emphasized the crucial role that technology and innovation can play in supporting those who wish to age in place.

Three Distinct Societal Developments

- An entrepreneurial, non-traditional Canadian charitable organization established in 2004 in Vaughan, Ontario, Canada.
- It focuses on developing Innovative programs in the Health, Economic, and Social sectors. Technology use in projects has been an integral element.
- We serve low-income families, newcomers, refugees, people with disabilities, seniors, seniors living with dementia, and other health conditions.
- Serves around 5,000 people each year, 1,500+ of whom are diverse seniors
- A staff of 10 full-time and 6 part-time employees, with more than 40 volunteers
- Has received numerous innovation awards:
 - Accessibility award from the City of Vaughan
 - Selection among the world's top five age-friendly initiatives, Turkey
 - 3M health leadership award
 - Innovation award from the Ontario Ministry of Health and Long-Term Care and Ontario Hospital Association
 - Others

About Human Endeavour

A barrier to seniors with dementia utilizing technology is that the existing off-the-shelf technology does not meet their specific needs. They need simplified, individualized, and customized technology.

Off-the-shelf Technology

Human Endeavour has been developing technology products and Apps since 2014.

However, the demand for its products and services accelerated during COVID-19, when it introduced an innovative **senior-friendly Gen 1** tablet and remote tech support to keep seniors engaged, active, and healthy from the safety of their homes.

It was followed by a **senior-friendly and accessible Gen2** tablet for people who were blind, low-vision, deaf, or low of hearing or had fine motor movement issues.

It was followed by a cutting-edge **senior-friendly, accessible, and automated Gen3** tablet for seniors living with dementia or memory issues.**[Today's presentation]**

Each new tablet generation is built on the design of its predecessor, by adding more features (specific to a health condition), intelligence, automation, and decision making.

COVID-19 and Need to Innovate

- In response to a call for a proposal from PHAC in late 2022, Human Endeavour proposed Tech-Empowered Healthy Living (TEHL) for Seniors with Dementia:
- To improve the quality of life and well-being of persons living with early-to-moderate stage dementia and their carers (caregivers)
- To carry out an impact evaluation study (intervention research) to measure the effectiveness of the technology and its impact on the lives of seniors and carers.
- To share findings from this intervention with the community, industry, and research sector.

TEHL Project Objectives

An Innovative, Collaborative and Cutting-Edge Approach to Support Seniors Living With Dementia

An Individually Customized, Senior-Friendly, and
Accessible Technology (Tablet + Location Tracker)
with Automation, Intelligence and Support
for Seniors Living With Dementia (SLWD)

A fully integrated system

- **Public Health Agency of Canada**
 - For the distribution of 110+ tablets and support to clients/carers/organizations in Ontario and Alberta at no charge
- **United Way of Greater Toronto / Allan Slaight Seniors Fund**
 - To support the design of the product
- **Project Partners (12)**
 - **Ontario:** Human Endeavour, York Region, Senior Persons Living Connected, Community & Home Assistance to Seniors, Punjabi Community Health Services, Alzheimer Society Brant, Haldimand Norfolk, Hamilton Halton, VHA Home HealthCare, York University
 - **Alberta:** Alzheimer Society of Calgary, Punjabi Community Health Services, Center for Newcomers, South Asian Senior Support Society

Thanks to Funders and Partners



The Tablet

- Designed for diverse groups of seniors speaking multiple languages with limited or no prior experience of technology use
- **Fully programmable and customizable to the individual's needs**
- **Verbally communicates with seniors in one of the 15 supported languages**
- **Activities of Daily Living (ADL) reminders in voice in 15 supported languages through Automation**
 - Interacts with the user to get confirmation of ADL completion
 - Auto-email/text message to carer if a task is not completed
 - Auto-run apps like (Zoom) through the preprogrammed calendar entry
- **Simplified Communication and Connections**
 - One-touch phone calls by touching the pictures of the carer, family members, and friends
- **Mind-stimulating games**
- **Real-time interpretation if the carer and client don't speak the same language**

The Tablet, Features and Support System

- Voice and text-based interfaces
- Auto-communicate the status (battery level, active, connectivity testing/fixing, etc.)
- Acts as a companion. Launch apps through voice commands/responses – launch YouTube, News, questions etc.

Built-in Internet/Voice

- Built-in internet/data and Voice SIM (all project SIMs in a single data pool)
- Built-in security software (Corrata) to protect against unwanted, malicious websites and attacks (policy-based protection)

State-of-the-art Support

- In-person training
- Multilingual call center support (1-833-461-0001, Aircall.io)
- Support through Human Endeavour or Partners' staff
- **Remote login capability to fix/upgrade in the field (TeamViewer)**

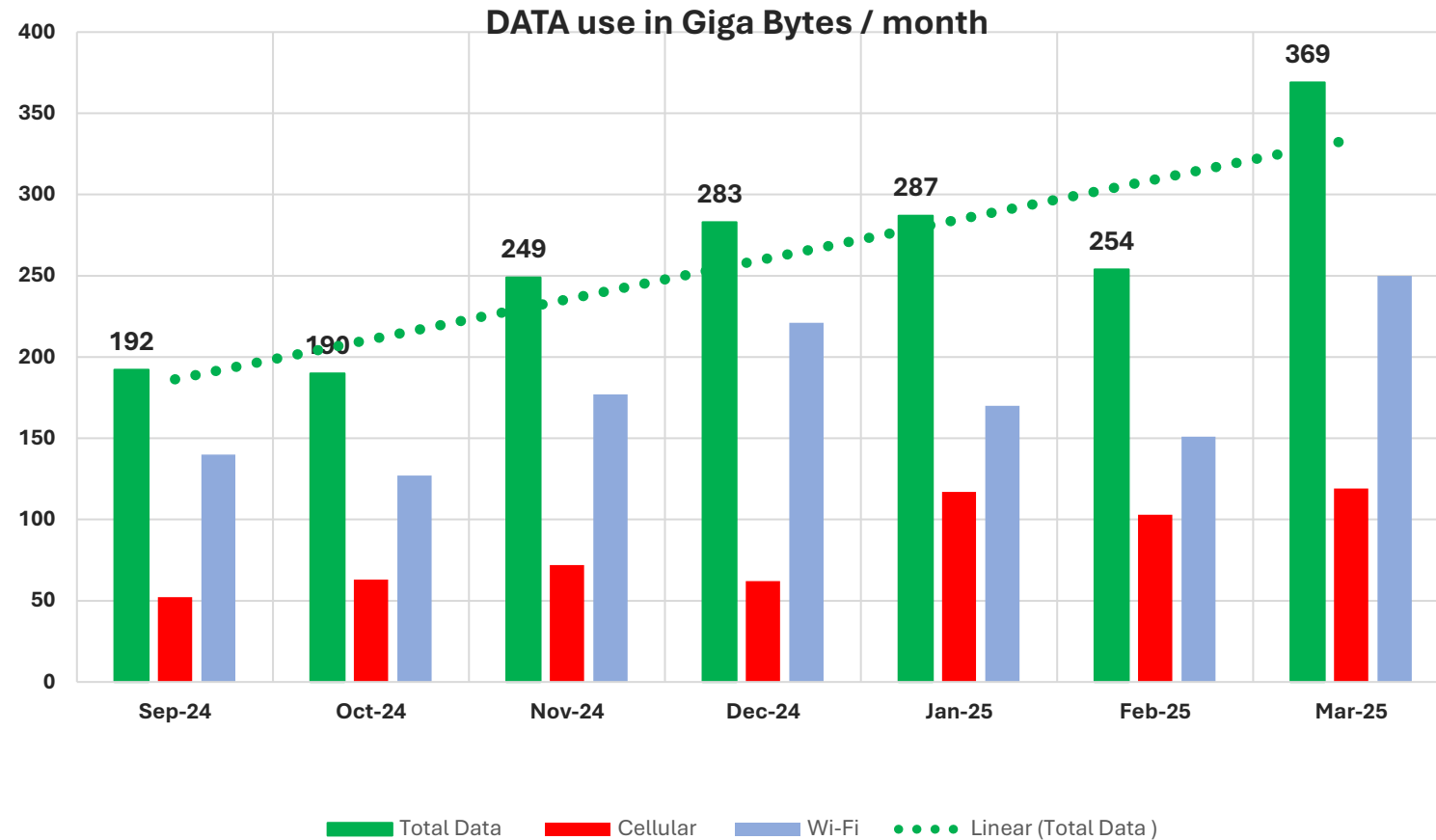
The Tablet, Features and Support System

Since the tablet can verbally communicate in 15 languages, we have also translated the training material in 10 of those languages. Additional languages can be added on request.

TRANSLATED MATERIAL

- **Training Manual** is available in the following languages:
- English, French, Ukrainian, Hindi, Punjabi, Tamil, Chinese (simplified), Italian, Spanish, Russian
- **Quick Start Guide** is available in English, French, Spanish, Chinese (simplified), Russian, Urdu, Hindi, Punjabi,....other languages will be available soon

Diverse Languages Support



Additional statistics on tablet use and support provided can be shared during the conference presentation. e.g., number of days on the internet, text sent/received, phone calls made, calls to the support center, remote login sessions/time, etc.

Statistics / Data Use etc.

Background Information

Introduction to Impact Evaluation

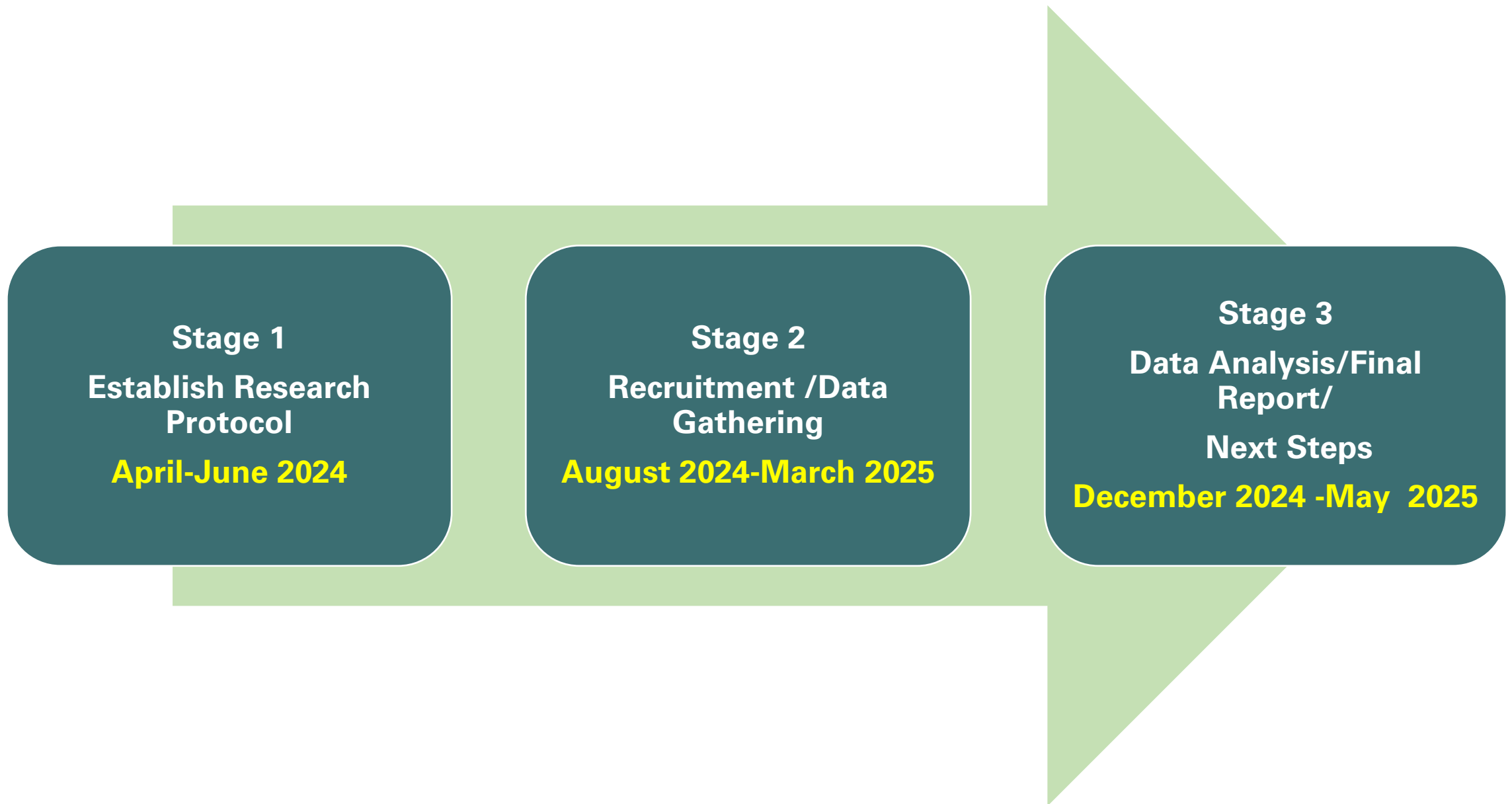
- The purpose of York University's evaluation of the TEHL tablets was two-fold. We looked at the efficacy of the tablets and at their impact on the well-being of the older adult living with dementia/memory issues and their carers. We also looked at the impact of the tablets on the organizations serving older adults living with dementia and/or memory issues.
- We deliberately sought input from seniors last to ensure we had a clear understanding of their overall response to the tablet before asking them to participate in the survey or interview.
- Additionally, we wanted an opportunity to collaborate with individuals with lived experience, members of the Canadian Dementia Learning and Resource Network's (CDLRN) Advisory Committee. Their feedback we knew would be invaluable, as we sought input on the survey as well as guidance on how to conduct dementia-friendly, empowering interviews with seniors living with dementia/memory issues.

Introduction to the Impact Evaluation

Impact Evaluation Study / Intervention Research

**Gen 3 – Tech Empowered Healthy Living (TEHL) for Seniors with
Dementia**

Human Endeavour / York University



TIMELINE – Impact Evaluation Study

Stage 2: Recruitment

- Inclusion criteria: Seniors with a diagnosis of early dementia or awaiting an assessment or showing signs of dementia referred by partner organizations. Seniors who report and/or whose carer reports memory changes or specific problems with memory that are interfering with daily life.
- Clients wishing to participate in the research must have used the tablets for a minimum of 2 months.
- Clients would still receive and use the tablet even if they chose not to participate in the research.
- The project's Community Research Advisory Board was consulted, and their feedback was requested at all stages of the research process, including data analysis and the final report.

Stage 2: Data Gathering

12 Managers were surveyed, and 7 in-depth interviews were conducted from among the pool of partner organizations involved.

33 Carers were surveyed, and 7 in-depth interviews were conducted from among the pool of 100 carers involved.

24 Seniors were surveyed, and 7 in-depth interviews were conducted from among the pool of 100 seniors involved.

69 surveys and 21 in-depth interviews in total

General Demographics – TEHL seniors/carers

- Seniors age range 59-97 years (avg. age 77)
- Seniors gender 51% Female, 48% Male, and 1% Two-spirited
- 65% living with carers in Ontario and Alberta (Canada)
- Carer age range: 80-89=24%, 70-79=30%, 60-69=24%, 30-52=21%
- Languages spoken by seniors: English, French, Cantonese, Mandarin, German, Greek, Gujarati, Hindi, Italian, Urdu, Tamil, Punjabi, Spanish, Tagalog, Portuguese, Russian

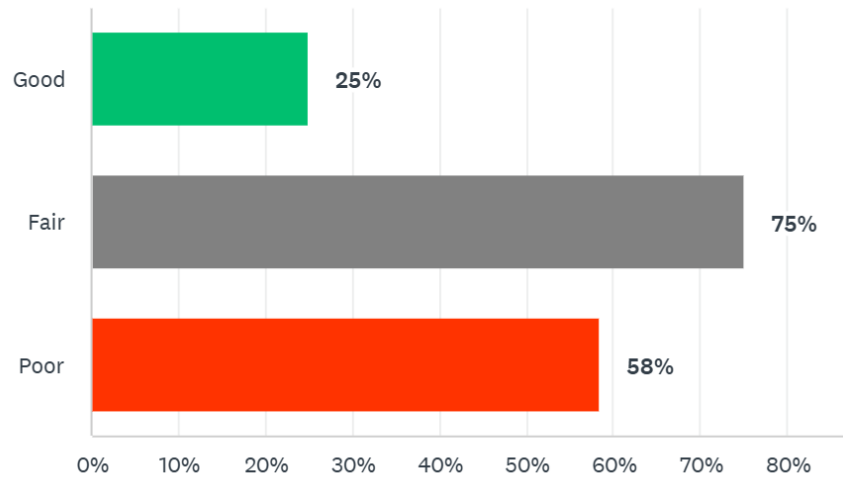
Research Findings Managers, Carers, and Seniors

Manager Surveys

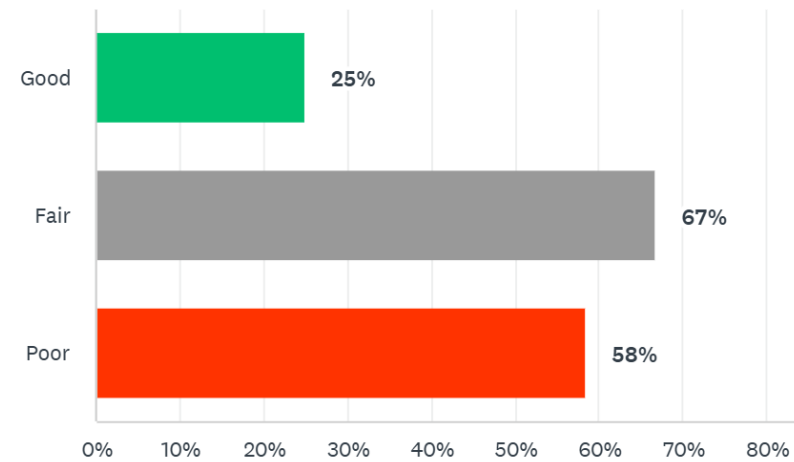
Demographics & Benefits to the Organization

Manager Survey

Q8: Physical Health Status (of seniors)

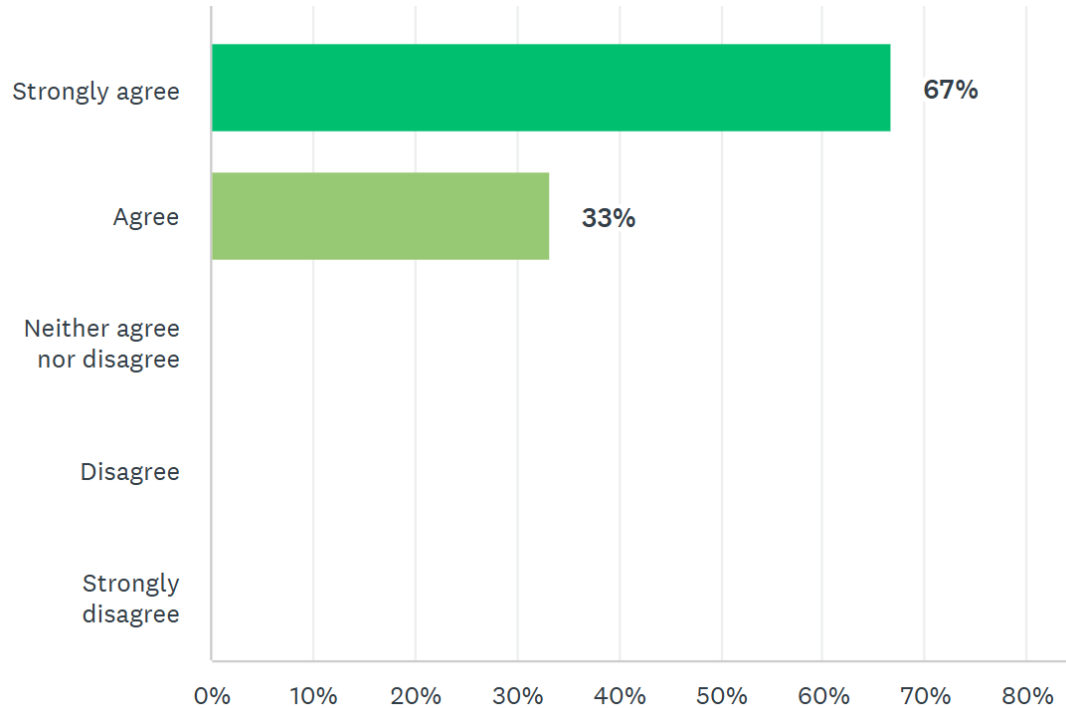


Q9: Mental Health Status (of seniors)

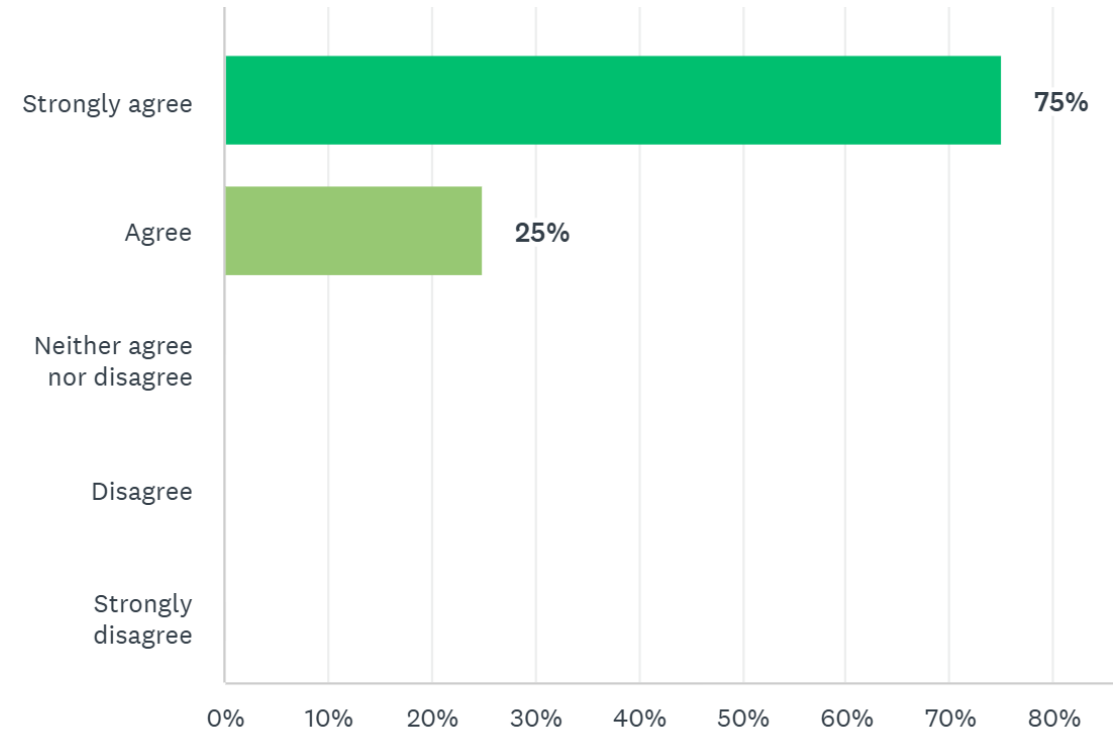


Manager Survey Contd.

Q18: I/my team found the design features of the tablet especially useful for a senior with memory issues/early dementia. (12 responses)

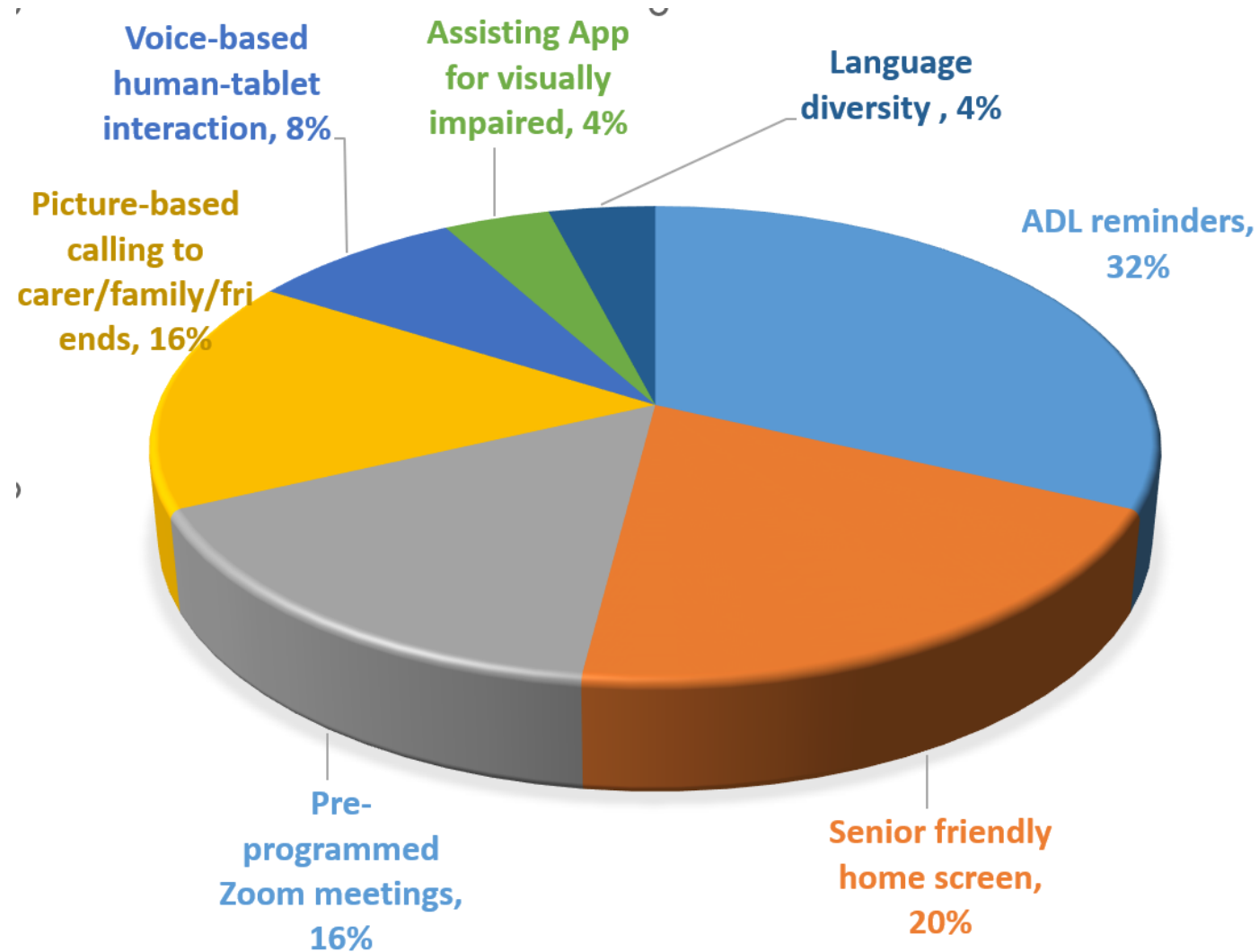


Q23: I/my team identify benefits to the organization of having the tablets for seniors/carers. (12 responses)



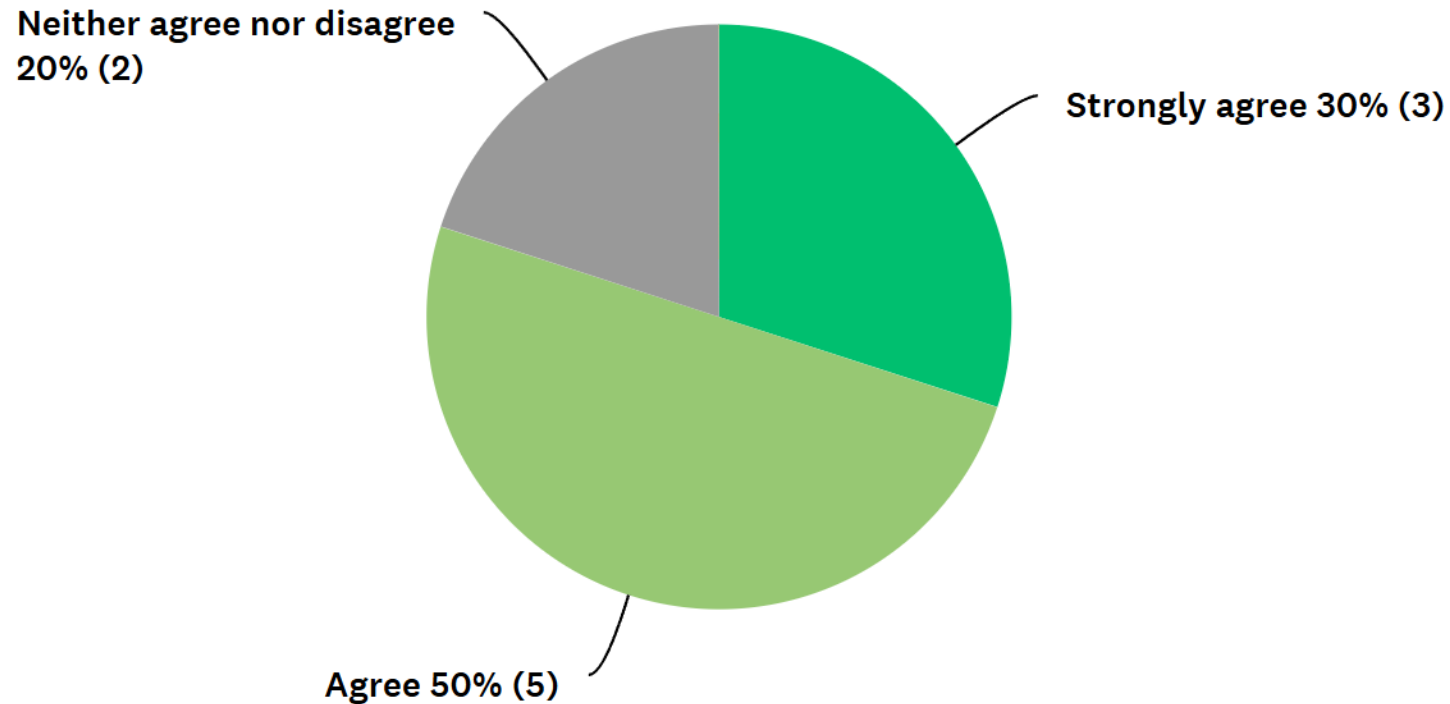
Manager Survey Contd.

Q19: Which feature did you find especially useful?



Manager Survey Contd.

Q17: I/my team was able to help the senior and their carer manage the tablet.



Manager Interviews

TEHL Impact on Organizations

Manager Interviews Contd.

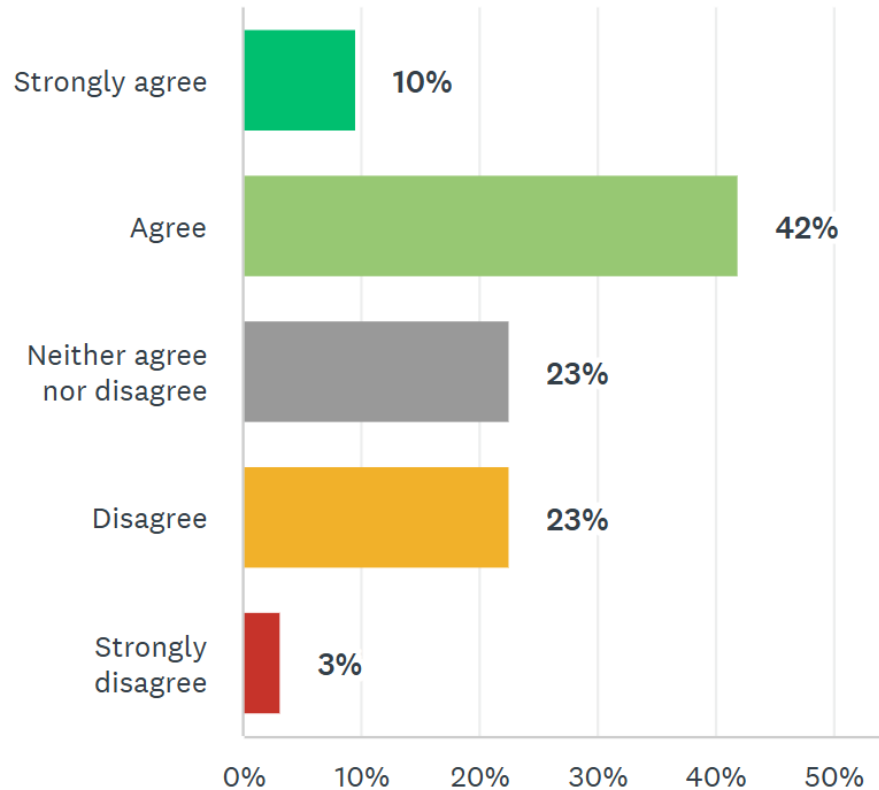
“Our agency is extremely excited to be involved in this positive life impacting initiative for persons living with dementia and their care partners. We also are very happy to be engaging with new healthcare /social service providers in Ontario and other provinces to learn, share and celebrate.”

“I think it's really beneficial for the organization. I was saying to someone a couple weeks ago that my vision for the future would be that whenever someone with early stages of dementia becomes a client, we say, here's your tablet. If everyone gets the tablet early enough, then they can be more independent for longer.”

Carer Surveys

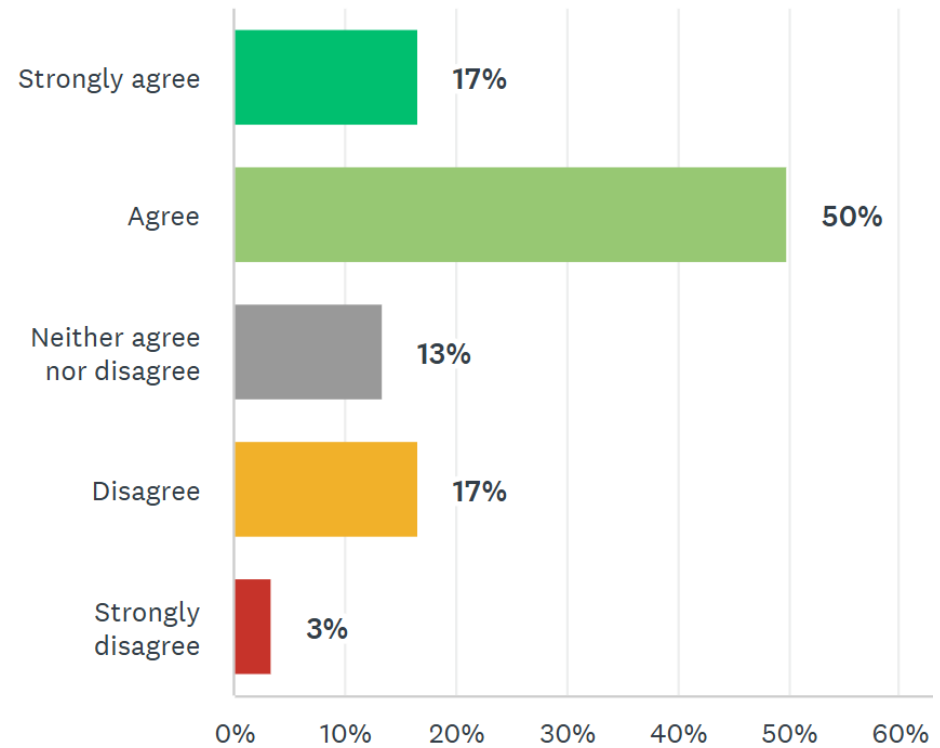
Carer Surveys – Benefits to Carer

Q28: The tablet lessens your stress and your care responsibilities (33 responses, NA=2 removed).



Strongly agree + agree=52%

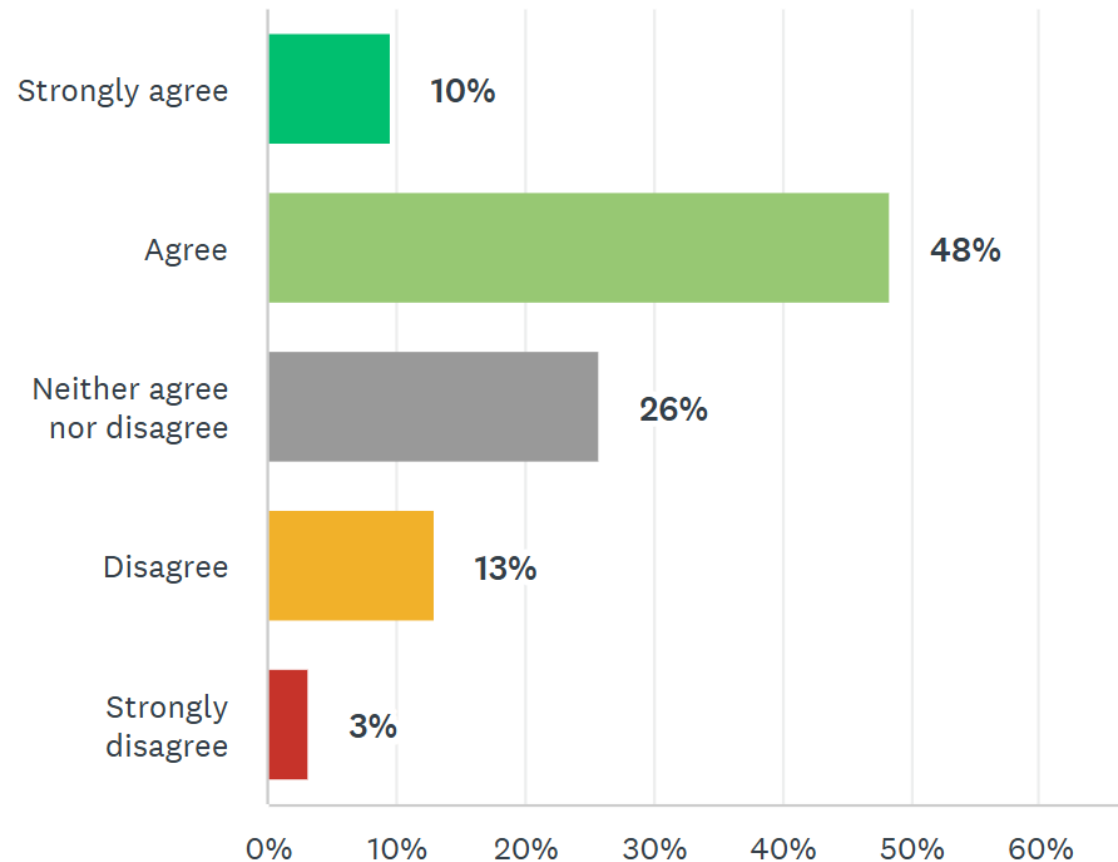
Q30: The tablet helps you feel more secure because the tablet keeps you connected to the senior (33 responses, NA=3 removed).



Strongly agree + agree=67%

Carer Surveys Contd.

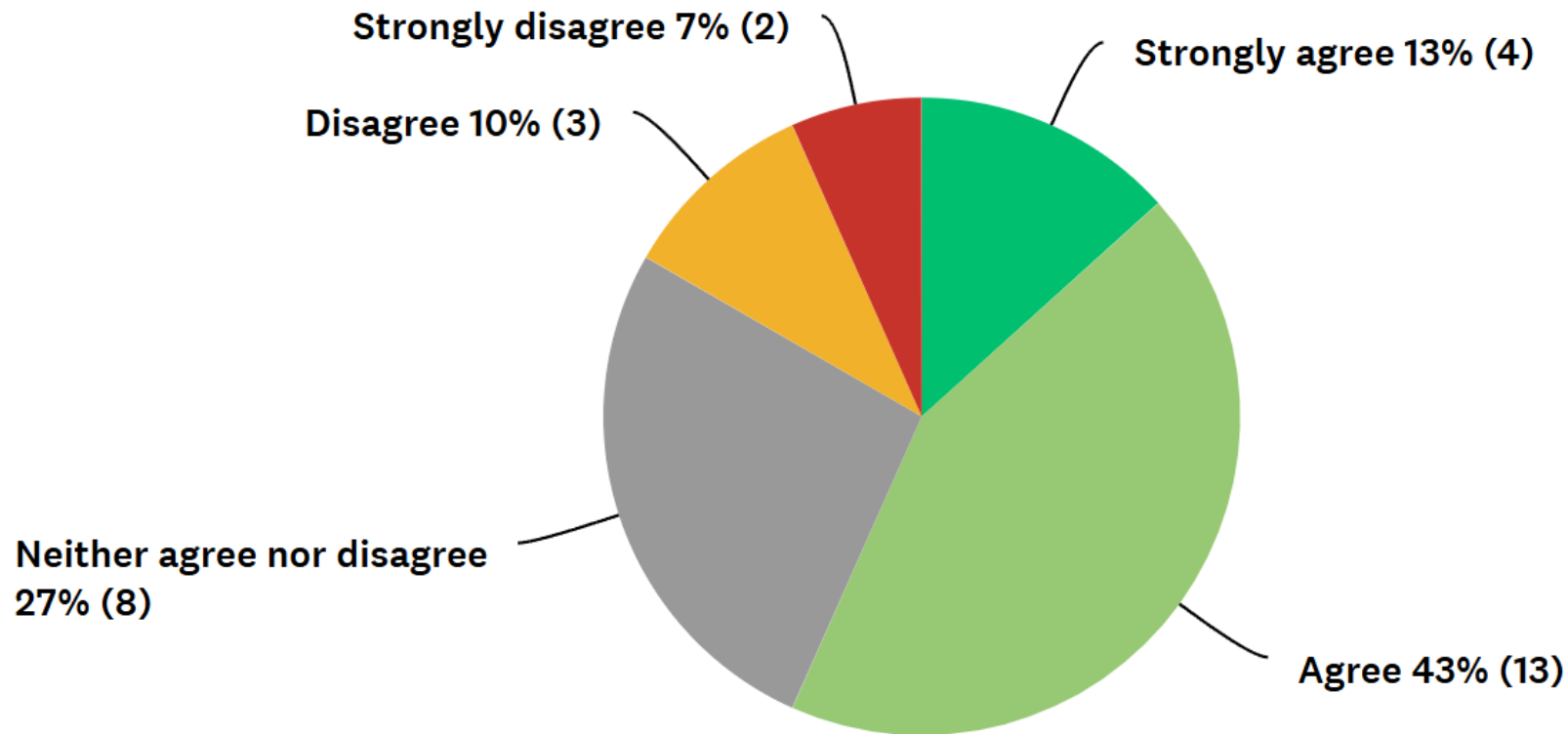
Q29: The tablet helps you feel freer and more independent because you can delegate some tasks to the tablet (33 responses, NA=2 removed).



Strongly agree + agree=58%

Carer Surveys – Ease of Use for the Senior

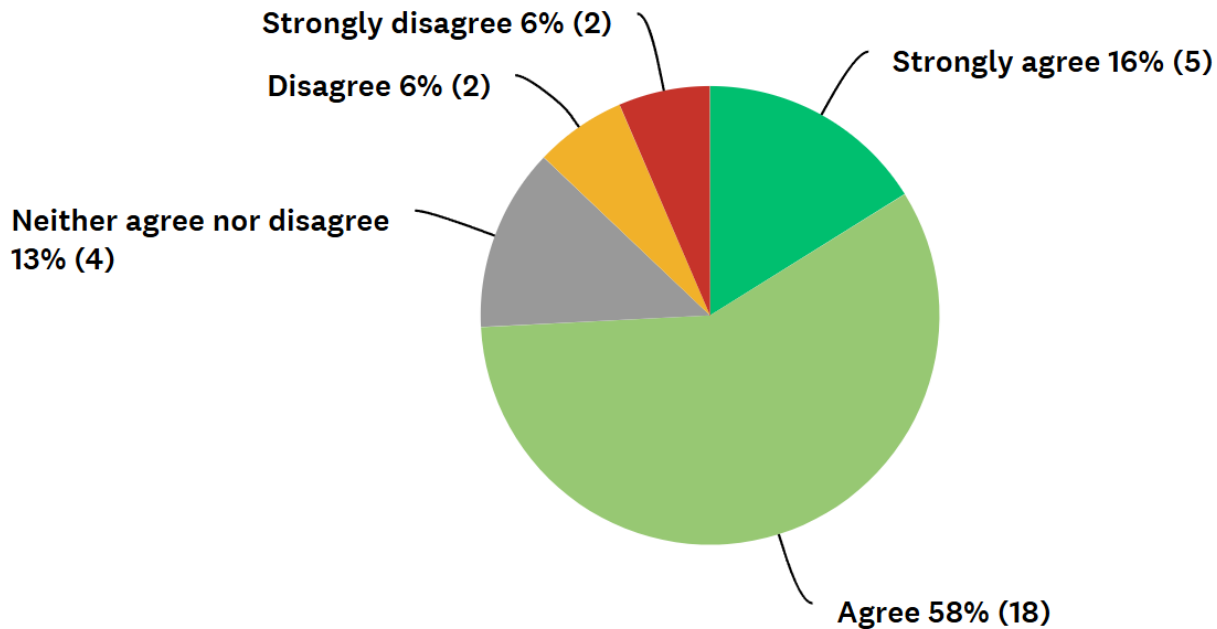
Q17: The tablet is easy for the senior to operate and manage (33 responses, NA=3 removed).



Strongly agree + agree=56%

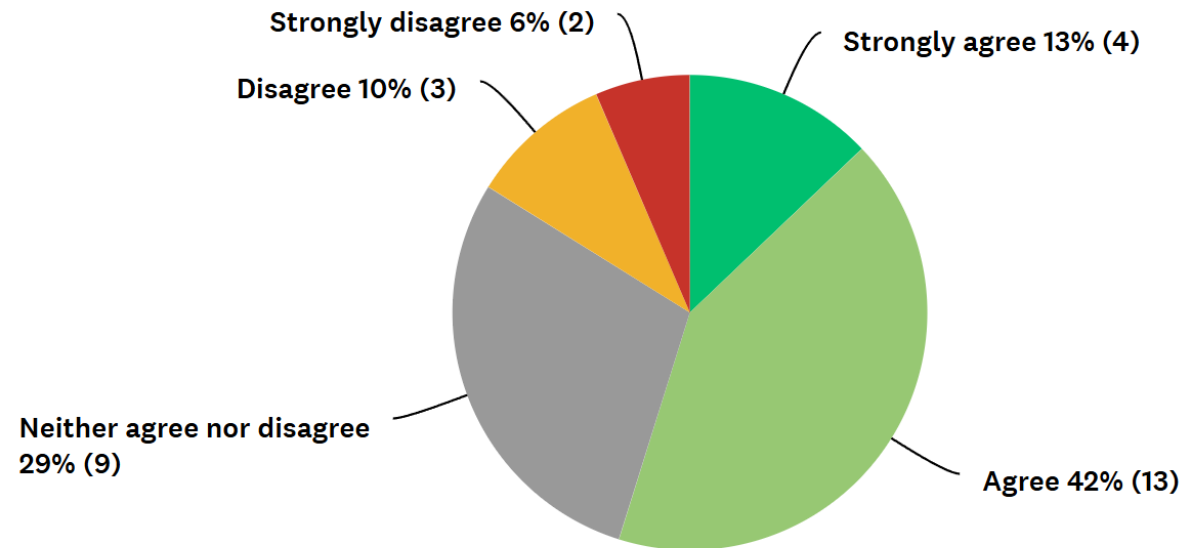
Carer Surveys – Benefits to the Seniors

Q22: The tablet helps keep the senior mentally active (33 responses, NA=2 removed).



Strongly agree + agree=74%

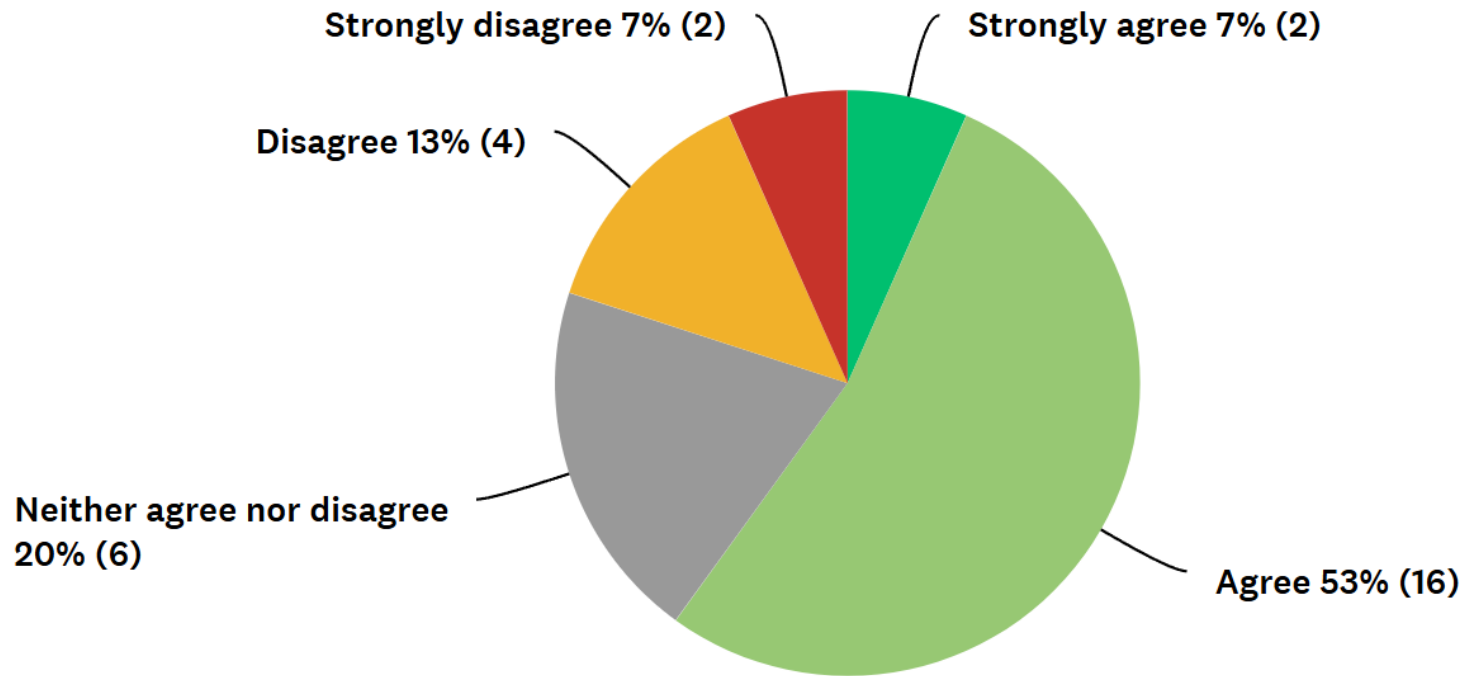
Q21: The tablet helps the senior live more independently than before because it helps him/her perform daily tasks with more ease (33 responses, NA=2 removed).



Strongly agree + agree = 55%

Carer Surveys Contd.

Q27: The senior's quality of life has improved by having this tablet (33 responses, NA=3 removed).



Strongly agree + agree=60%

Carers Interviews

Carer Interviews Contd.

“Having parents with dementia is not easy and if somebody's working, I'm working full time and I'm taking care of my father and I, of course I have my own family. So, this [tablet] is like a good hand to help me. Yeah, it's a helpful device.”

“Life, it's better for me. I think it is better for me and for him...This tablet really helped me. Without this tablet it's up to me. I have to handle everything. And we have arguments. I always forget things. Sometimes I forget to feed him, and I like to take a nap too. So, if I don't feed him, he doesn't eat. So, if I have the tablet to call me when it's time it's very good. So now he is just quiet because he is happy now. Yeah, he has food to eat. He has all the things to eat. And I'm happy, less arguments.”

Carer Interviews Contd.

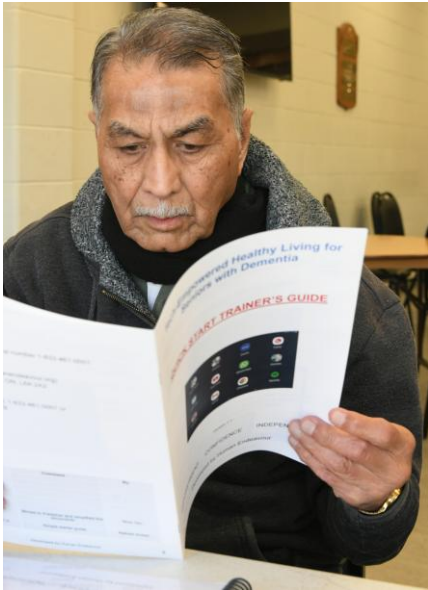
“So, it's easy for them to call me with the tablet's picture calling whenever they need something. Just one click and my phone rings. So that's another feature that I find very helpful and supportive.”

“She said her husband was watching tv and all of a sudden, he got up and she said, what are you doing? And he said, well, the tablet told me it's time to drink water. So, I'm getting up to drink water. And then another night, she said he was going to go do something. And she's like, what are you, what are you going to do? And he said it's time to take garbage out. So, there's things that are happening without me saying it now.”

Senior Surveys

Senior Surveys – 5 Indicators

Below are results for five key indicators identified by the Public Health Agency of Canada. Percentages show the proportion of seniors who “strongly agreed” or “agreed” using a Likert scale.



Indicator 1:
Increased
technology
knowledge
and skills

64%

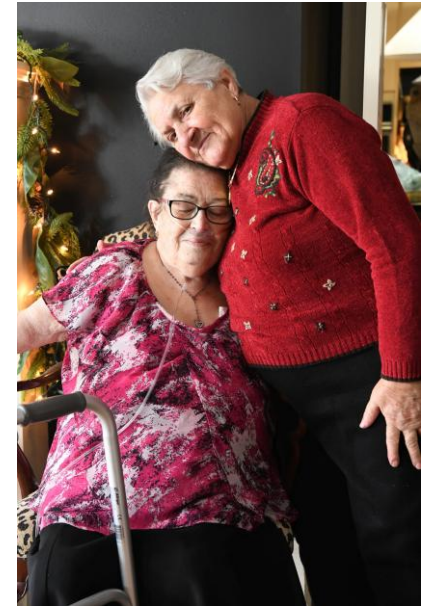
Indicator 2:
Improved
health
behaviors
(e.g. on time
medication)

87%

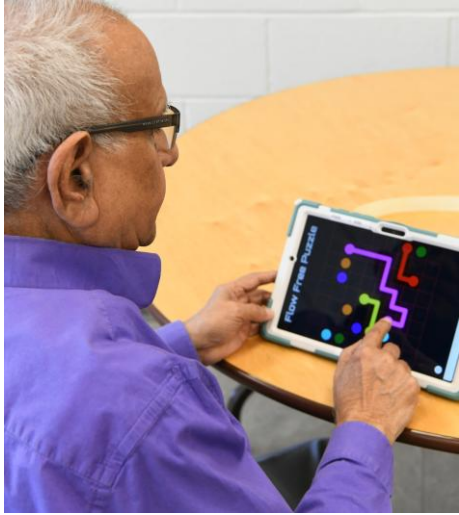


Indicator 3:
Improved
protective
factors (e.g.
feeling
secure)

80%



Senior Surveys – 5 Indicators

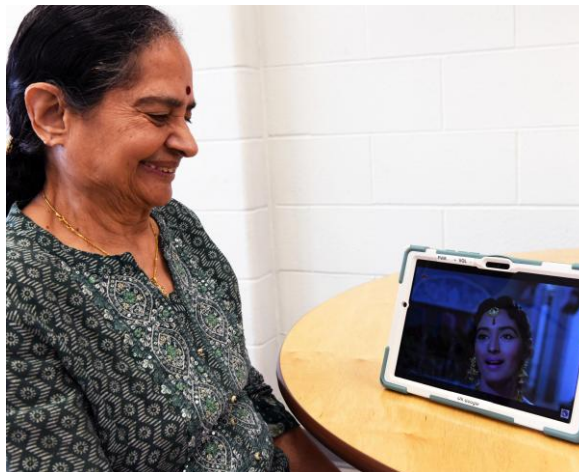


Indicator 4:
Improved
well-being
(cognitive)

83%

Indicator 4:
Improved
well-being
(emotional)

74%



Indicator 4:
Improved
well-being
(social)

80%



Senior Surveys – 5 Indicators

Indicator 5:
Improved
quality of life
(carer's
perspective)

60%



Senior Interviews

Senior Interviews Contd.

"The tablet is a close friend on my side always, to be stronger and happy."

"I feel more engaged at the level I am at."

"I regain some of my independence by depending less on other family members."

"Sometimes I have a problem so it contact me to my relatives there and they call me on my phone and so I am safe. I have a good friend with me."

"The tablet has become a member of the family. It's the Rat. There's a little shelf I have to build for him. For a bed. If I don't take my medication the tablet reminds me and If I don't answer, it rats me out and my wife gets told. Yeah the tablet's supposed to be on my side. I just say he's a Rat Bastard (RB). I hope RB doesn't have the capability of listening in to any of my connections."

Recommendations

- Further innovate ease of use, security, and automation.
- Strengthen and expand the network of organizations committed to using assistive technology for seniors.
- Raise awareness about assistive technology and its benefits through evidence-based practices.
- Introduce the use of ML (Machine Learning) and Artificial Intelligence (AI) [Gen4+].
- Collaborate with additional Universities for research and technology innovations.
- Demonstrate evidence and calculate return on investment.
- Get buy-in from the policymakers on the role of assistive technology
- Seek long-term investments to create a meaningful and measurable impact in the sector.

Next Steps

Gen 4 – Activities of Daily Living (ADLs) Monitoring with Sensors for Seniors (Living With: Dementia, Memory Issues, Cognitive Challenges, Frailty)

Smart Homes

To fill the gaps identified in Gen 3, Human Endeavour is developing a smart home technology that intends to install sensors in homes that will automatically monitor/capture important information about the Activities of Daily Living (ADLs) in real time to:

- Enhance well-being, safety, and quality of life
- Show health trends
- Prolong independence

Prototypes are now available to selective partners.

The Gen4 prototype will contain four sensors: 1,2) door open/close (for fridge & washroom), 3) bed occupancy, 4) motion, and visualization software.

The frequent washroom visits can indicate a health issue. A lack of fridge opening can indicate malnourishment. Sleep patterns can predict general health status.

Gen4 –Monitoring with Sensors

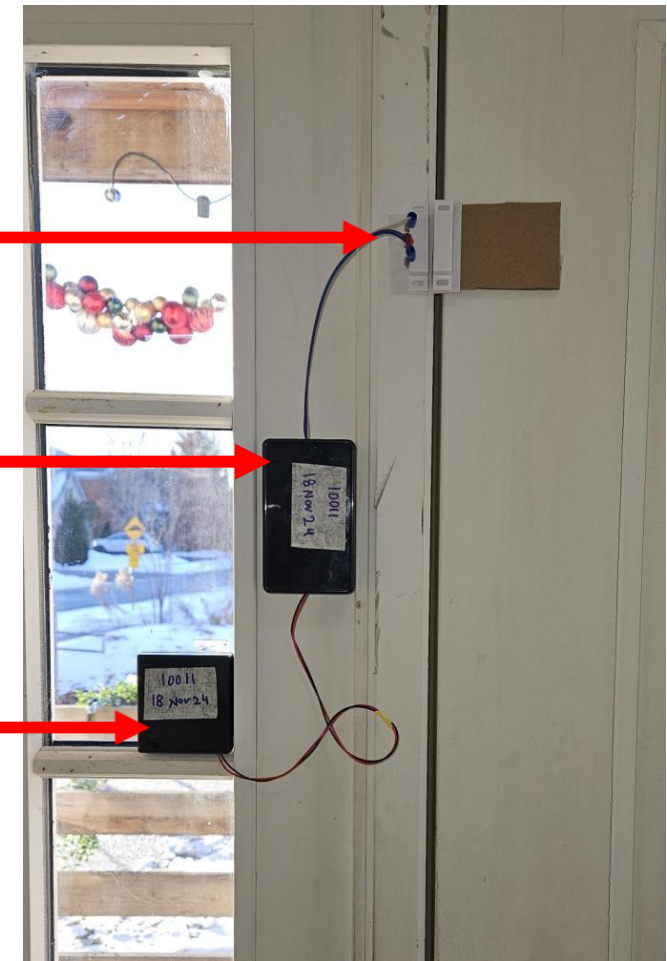
- Data is transmitted from the sensor to the associated “Common Sensor Board (CSB) developed by Human Endeavour (HE)”
- CSB sends secure data through local Wi-Fi to the Microsoft Azure cloud database (mySQL)
- The dashboard software, developed by HE connects with mySQL database periodically/in real-time and displays on a dashboard in graphical form

Contact Switch (door open/close)

Common Sensor Board



Battery



Gen4 –Sensors/Data

Active Daily Living Sensor Report

Date of Data: 2025-01-10

Date	2025-01-10
From	12:01 AM
To	12:59 PM
Organization	demo_org
Unit	123 Demonstration Ave
Submit	

ID	Type	Location	Graph	Count	Duration
10004	Door	Main Door		41	00:00:54
10005	Door	Washroom		13	00:03:43
10006	Bed	Bedroom		3	05:51:35
10007	Motion	Living Room		88	00:01:57

Reference Graph

Click the button to switch between hourly ticks and minute-by-minute ticks

Switch Units

Reset Zoom

Q & A

10-15 minutes

Thank You

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