Dementia Care during a Healthcare Crisis

By Aneesha Kotti

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DEDICATION

This project took different and numerous tangent turns over the period of working. But it originated from one single person and the lasting impact she has had on my life. The project idea, if not related to her, was influenced by the way she lived her life, independent and strong.

I take this opportunity to dedicate this project to my late grandmother, Jayaprada Bhogireddi, whose strength and resilience showed me that everyone carves their own life and every work we do needs to have holistic benefits to people and self. I have specifically used her maiden name in this document as I wanted her name to be etched at least in one archive for who she truly is - foremost a teacher, both by profession and in life, eternally offering inspiration and lessons that make a huge impact on what I am today.

Thank you Nani...

ABSTRACT

Living through the COVID-19 crisis, *Dementia care in Healthcare Crisis* project highlights existing challenges faced by dementia patients in the long-term care system. Through this study, the field of study is explored using foresight methods to better understand future care provisions in the event of impending pandemics.

The project empathizes with patients in the Ontario system of long-term care while being cognizant of the dilemmas that emerge as a result of healthcare crisis. It reviews current literature and emerging forces of change to understand how things can develop in the future. With scientists assuring the occurrence of future pandemics as a result of globalization and migration, it is assumed the next pandemic will disturb the global environment 15 years into the future, in the year 2035. This project aims to develop alternative future scenarios that discover potential ideas which need to be further worked upon to provide the best form of care for dementia patients.

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1   DEFINITIONS & ACRONYMS

Augmentative and Alternative Communication - AAC technologies offer multiple ways for dementia patients to communicate their needs without needing verbal expression.

Omni-connectivity - *'Omni'* means 'all encompassing'. The growing network of 'Internet of Things' links all objects around dementia patient by embedding it with technology.

Activities of Daily Living (ADL) - Refer to fundamental skills that are required for daily self-care such as eating, bathing and mobility

Adult Foster Care home (AFC) - This setting offers older adults who are dependent on assisted living to reside with a homeowner who can provide services as per their need.

Artificial empathy - Development of artificial intelligence systems to be able to detect and respond to human emotions in an empathic way.

Culture traits - Any characteristic of human action that is learned through social interaction and relationships. It is a single object, action or belief.

Culture complex - A set of interrelated cultural traits, which are the smallest units that create a culture.

2   INTRODUCTION

The caregiver held the iPad at eye level to the patient in the armchair. She gently called out to the patient trying to get her attention as the patient stared across the room. Though her grandson greeted her enthusiastically over a Zoom call, the patient vaguely glanced at the screen, turning her focus to the window that looked onto a lush, green garden. The grandson tried to evoke a reaction from her by describing his improved cooking skills during the pandemic. He reminded her yet again that there was a virus going around and that he would visit her as soon as he could. Once the time was up, he bade goodbye and disconnected the call. The caregiver made sure that the needs of the patient were met before exiting from the room. The caregiver kept looking outside the window as dusk fell slowly.

This is a hypothetical but common story of most dementia patients as they battle the novel pathogen that was introduced into this world in the year 2019. COVID-19 emerged as a zoonotic introduction in a distant city in China, but the disease quickly became a pandemic as a result of globalization and interconnectedness. COVID-19 is a highly contagious disease that spreads through respiratory droplets and aerosols, interactions between human-kind has escalated the spread of the pandemic. The virus has placed enormous pressure on our healthcare systems that have not been equipped to deal with a crisis on this scale which requires urgent mobilization of resources that affects the whole population.

A particular impact of this disease can be felt in long-term care homes where the old age factor of the senior population poses a greater risk to mortality from the virus. Canada's healthcare system was designed over fifty years ago when a Canadian's average age was 27 years with a life expectancy less than 70 (National Institute on Ageing, 2019). But with the latest advancements in medicine, life expectancy has increased beyond 80 years, increasing risks of disease, disability, or impaired cognitive reasoning (Action for Seniors report, 2014). The heavy casualty toll in long-term care homes has forced the Canadian Government to respond by

issuing strict restrictions to protect its aging population, including social distancing measures that limit contact with near and dear ones (Bogart, 2020). These restrictions can cause a severe setback in residents marked by dementia who are at higher risk of isolation and depression without the support of loved ones. With limitations in place from seeing close ones, residents have heightened isolation, increasing their mental and behavioural health disorders, effectively diminishing their spirit (Hsiao et al., 2018).

Blissfully unaware of the condition of the world outside long-term care home, dementia patients tend to *wander* in need of social connection and physical touch, increasing the chance of spreading the virus to other patients or care staff (Kane, 2021).

Future pandemics of viral will emerge more often, spread more rapidly and do more damage in the world. According to Prof Kate Jones from University College London, evidence "broadly suggests that human-transformed ecosystems with lower biodiversity, such as agricultural or plantation landscapes, are often associated with increased human risk of many infections" (Gill, 2020). In a world that is becoming significantly transnational, progressing rapidly on scientific and technological frontiers, this research aims to understand and identify potential ways to build on long-term care in the event of a future global pandemic. The research question has been framed as such:

What does the future look like for dementia patients in long-term care homes of Ontario, in the context of impending pandemics?

The research project makes use of foresight methods - Trend Matrix and Generic Futures, to provide recommendations for specific user groups identified through the method of Stakeholder Mapping. The recommendations are overarching and provide potential future orientation for long-term care homes to effectively provide dementia care in the event of a future pandemic.

3   BACKGROUND

Dementia care challenges during a pandemic

The unprecedented challenges brought by the COVID-19 pandemic forces people to remain in seclusion. Being separated from one's family, community, and culture is a source of suffering on its own. There is a general lack of awareness that comes with quarantine and social isolation, with minimal discussion on the mental suffering of the patients who are at high-risk from COVID-19, (Rhee, 2020) especially when dealing with a progressive disease like dementia. It is a disease marked by cognitive decline, impairment symptoms, and communication difficulties that causes hindrance to one's daily activities. Such patients would require periodic follow-up visits and close management of their condition. But during the pandemic, managing a dementia patient can be incredibly challenging. Some of these challenges include the disease's impact on day-to-day activities, the emotional toll on patients and caregivers, patient's declining comprehension capacity resulting from disease progression, etc,. The risk factor associated with old age of dementia patients to the virus encourages social isolation from the outside world and even within the bounds of a long-term care facility. This would be a drastic change of lifestyle for a dementia patients who do best when familiar faces are around then and when a routine is followed. But the biggest challenge in attending to a dementia patient during the pandemic would be the struggle of isolating patients from one another to limit the spread of the virus. Given their failing memory, it is highly likely that even if one informs an elderly resident about the dangers of social interaction during the pandemic, they would not be able to remember the restrictions which are effective within the LTC (long-term care) facility. Safety instructions such as regular hand washing, not to touch the face, etc., might also be rendered futile. In need of social connection and physical touch, dementia patients usually tend to wander, a common practice implemented when they are lost or confused, in an attempt to trace back to familiar places or faces (Kane, 2021). These patients

can be redirected and managed, though the act itself can pose a significant risk for the virus to spread to other residents and staff. It is unethical and inhumane to lock up residents within their rooms, especially in their fragile state. It is crucial to preserve their freedom and the sense of dignity held by people who have led a normal, healthy life for most of their life (Alberta Health Services, 2020).

Effect on healthcare systems and counter measures

Catering to patient needs amidst such challenges places mounting pressure on healthcare systems to provide for the well-being of the patients. Not all long-term care systems are fully equipped to battle the pandemic. Insufficient protective equipment, lack of medical personnel and new policy updates have seen surge within long-term care homes (Casey, 2020). The communal nature within the home, combined with most residents' chronic conditions, makes the people living there, including staff, extremely vulnerable (Tips for dementia caregivers, 2020).

To keep the healthcare system from falling apart, the government had to intervene on both provincial and federal levels, placing measures to limit the spread of the virus. The Ontario government assembled a task force consisting of geriatricians, virus prevention and control specialists including other relevant experts to provide recommendation on effective measure to limit infection spread and improve outcomes for residents of LTC homes. The report that was submitted did not just address unique challenges in LTC homes but also sought out the systemic issues that contributed to the severity of outcomes during the pandemic suggesting due measures that addressed both aspects ("Long-Term Care and COVID-19", 2020). These measures are brought in as restrictions, policies, strategies, etc. However, these measures disrupt the normal relationships that exist between healthcare providers and their patients furthering the distance between people working within the system and people receiving care

outside the system. Patients and loved ones navigated shifting policies without expert knowledge or support. Thrown into a new world of diseases, possibilities, and circumvention, healthcare professionals are carrying the burden of providing care to dementia patients in a novel manner to protect both sides from infection. Even healthcare providers and facilities had to devise their individual approach according to the guidelines drawn in policies leading to no standard protocol for a particular crisis (Patient Ombudsman, 2020).

Professional caregivers in LTC

Not all people living with dementia require external help. The degree of assistance to manage one's daily activities determines the need for professional care staff. But as dementia slowly progresses, the needs for personal aid increases to help them manage their physical and mental well-being. But in LTC homes, infection control procedures become difficult to manage as dementia individuals rely on the human touch as a language to promote feelings of safety and well-being. Touch has been a sought-after form of therapy, primarily provided by the caregiver, eliminating pharmacological medications that might affect the patient's physical and behavioural condition. Through this contact, the resident starts trusting the physical environment they have been introduced to, bonding with the caregiver, and feeling more comfortable communicating their needs and wants. Stress decreases in the process, with lower levels of cortisol released within the body. Detachment from the human touch might confuse a dementia patient on the relationship that has already been established with the care provider. Anxiety, feelings of isolation, lowered trust, and negative response to an attempt at communication are probable effects in the absence of touch (Geller, 2017). But maintaining operations with the staffing shortages during any pandemic, epidemic or disaster can be very difficult. Either due to the possible fear of acquiring the virus through close contact or physical and emotional fatigue, have prompted professional caregivers to quit their jobs in LTC in large numbers (Welsh, 2020).

Consequently, it causes a loss of tacit knowledge possessed by caregivers who have had ample experience working with a dementia patient, with implicit awareness of the patient's needs and routines ("People have quit", 2020). Tacit knowledge is personal to individuals, including expertise, know-how, intuitions, and subjective insights (Molesworth, 2014). The knowledge possessed on the well-being of a patient can be measured in terms of objective and subjective.

Subjective quality of care _is considered from the client's point of view ("symptoms"), including feelings and perceptions gathered from communicating with the patient. Example, feeling hot, pain, tired or nausea._

Objective quality of care _relies upon facts and measurable data ("signs") obtained through observation, experimentation, and testing. Example, lab or diagnostic testing, visual injuries or swelling_ (Subjective vs. Objective, 2018).

The quality of care provided through tacit knowledge is a personal relationship established over a prolonged time between caregivers and patients. By measuring the quality of relationships on subjective standards, a high-quality accord is built between care provider and patient, creating a positive interaction that enables the provider to gather adequate insight (Reinders, 2010). Dementia is a progressive disease that worsens with age. For people whose cognitive abilities are declining, it is imperative for staff to be conscious of cues and signals to make sense of patient needs. With an experienced team quitting work, newly trained staff lacks knowledge that is necessary for providing care.

The optimal care received by a dementia patient is regulated based on effective communication with personal care providers or loved ones. As dementia progresses, the ability to process information may deteriorate over time, delaying a patient's response to a question. Even if they comprehend the question, dementia problems are often associated with hearing, speech, and sense of touch and hence they are unable to provide a clear response to the

question. Professional caregivers should understand the implicit behavioural actions of a patient and accommodate their needs accordingly ("Tips for Dementia Caregivers", 2020).

In view of the rapidly changing world in contrast to a dementia patient's perception of time, it is important to step up to provide for their needs in the context of a future pandemic. This project aims to glimpse into that future and how it might evolve.

4   METHODOLOGY

This project implements foresight methods to make sense of research, envision possible alternatives of the future and provide interventions to foreseeable events in the future for dementia patients in Ontario's long-term care homes. In the process of answering the primary research question, the research aims to answer the following sub-questions:

• How might one manage structured and organized long-term care in a systemic crisis?

• Has a new normal been set in long-term care homes in the aftermath of the COVID-19 pandemic?

• How does healthcare in LTC's evolve, post-pandemic?

Literature Review - Guided by the research question, a preliminary review of literature has been conducted by surveying articles, medical journals and statistical data from reliable sources as well as attending webinars and listening to podcasts that focus on current developments of LTC for dementia during the COVID-19 pandemic. The literature search focused on the challenges of dementia care provision and the pandemic effect on healthcare systems and healthcare providers which directly impacts care provided to a patient. This research further contributes to foresight methods used in this project while critically evaluating current literature on how care is provided for dementia patients in LTC homes.

Trend Scanning - To study disruptive developments in LTC in the middle of a global pandemic, trends are scanned across the contextual environment, gathering information from current events in a process known as trend scanning. Trend scanning involves scouring popular media such as news, magazines, blogs, articles, and journals to find influential changes that would be noteworthy to anticipate highly uncertain futures. Trends are changes occurring across the world which might influence the system. These trends relate to the evolution of change in LTC homes in numerous and complex ways. These trends were identified from two types of environments:

- The immediate environment where LTC homes have high influence and a clear understanding of the internal dynamics.

- The contextual environment is outside the immediate environment where the organization has no power of influence, enabling to see the 'big picture'. Keeping an eye on the contextual environment prepares for disruptive change when it happens down the lane ('Welcome to Management', 2015).

There are substantial future trends to be analyzed in the contextual environment since almost everything can have an impact on the future in some way or the other. Each signal of change will have varying degrees of likelihood, impact, and urgency (Roherbeck, 2013). STEEPC, an acronym for Social, Technological, Economic, Environmental, Political and Cultural allows for an extended search on subject matter. The data that emerges from this process is applied for the foresight methods - Trend Matrix and Generic Futures, which form the next steps in analyzing present and future strategies for LTC homes.

Trend Matrix - Through this method borrowed from *101 Design Methods*, a high-level summary of trends is acquired by understanding what is changing in the LTC environment across time which makes it easier to see how rapidly things are changing across the selected macro-trends (Kumar, 2012). The trends are charted under the aspect of time as 'formerly', 'currently' and 'emerging'. Trends collected for 'formerly' are gathered during the influenza 'swine flu' pandemic in 2009 while 'currently' trends are gathered during the COVID-19 crisis in 2019 through to 2020. 'Emerging' trends which carry potential for growth over time are gathered from the year 2021. The intersection cells between macro-trends and aspects is filled with trends identified through online research and trend scanning on dementia care in LTC homes. An inter-relation between these trends provides us with a potential link based on which the future direction of LTC can be determined. Since the Trend Matrix only provides a high-level overview of changes, Generic Futures method is used for deeper analysis to provide proposals.

Generic Futures -   This method has been employed to create distinct visions of how LTC

homes can effectively tend to the needs of dementia patients in the event of an impending

pandemic. Scenarios are qualitatively distinct visions, expressed as narratives of how the future

could unfold. The four futures of *growth, collapse, discipline* and *transform* form different

narratives to the future of long-term care. The trends realized from Trend Scanning act as

building blocks for scenarios, which are multiple alternative futures, built from intuitive logic. It

creates plausible outlooks towards the future that decision makers and stakeholders can use to

determine the best path forward and to be prepared for alternative futures. Explicitly making

assumptions of the future, this method allows wide exploration of trends to envisioning potential

futures and determining the best response (Dator, 2017). Each future scenario is supported by a

Backcasting Process that starts with a defined future and moves backwards to the present

creating a robust vision of each alternative future by describing how each one can come into

fruition by following specific actions, under certain assumptions. The method identifies feasibility

of each alternative future in time for the next pandemic.

Stakeholder Mapping -   The stakeholder map is drawn to identify primary users, from the

number of key stakeholders that constitute the LTC system, who were impacted the most during

the COVID-19 pandemic. Intervention proposals are provided for these stakeholders who could

be either on the care receiving or care providing end. These proposals are provided from

insights that emerge from the different foresight methods.

4.1   Trend Scanning

The following trends are gathered from an extensive array of signals that effect LTC home environment in Ontario. Owing to the vast number of signals found in the current field of study, substantial number of trends can be scanned which can lead the research in many possible directions. Hence, only trends that were most relevant to the LTC frame of study were extrapolated such that the recognized trends provide a broader-than-normal look of the LTC environment (both immediate and contextual). One of the major challenges faced while trend scanning was to secure credibility of source, away from opinions or biases. Biases were popular owing to pandemic confusion that led to opinion based analysis of a specific situation or event. The following table uses STEEPC approach to classify the recognized trends that helps to better understand what is changing in the environment by breaking them down into the respective categories. Detailed version of trends with implications and sources are provided in the appendix.

TREND	DESCRIPTION
Social	
LTC network accessible to all	Inclusivity is the new exclusivity as long-term care homes build an inclusive but diverse community within care homes instead of being portrayed as a service provision business. The diversity is not limited to cultural boundaries but also eliminate any physical barriers to accessibility through new age tech and improved architecture models.
Increase in dementia patients	The number of dementia patients have doubled by 2035 in developing countries. This increase is due to growth in Canada's senior population which is predicted to rise 68% since 2020. The rate of increase is not necessarily uniform over the time period.
Delayed retirement age	Delaying retirement age provides lat retirement benefits that are invested in LTC when in need of assistance to growing needs.
Home care over LTC	Long-term care homes are no longer accepted in Ontario as a potential setting for the elderly in need for services of care dropping occupancy In nursing homes. Limits to taking care of loved ones are traversed through growing technologies and adaptive procedures of treatment.

TREND	DESCRIPTION
Hospitals at home	Home-based treatment programs are boosted by developments in remote monitoring and wireless communication. Providing support for home care helps the elderly stay amid loved ones for a prolonged period, drawing back to the fundamentals across many cultures of looking after the elderly in the family
Selective intake into LTC based on triage	During health catastrophes, triage care offers priority to those patients who present with more complex needs than those who do not need immediate care. Based on these factors, population of residents in LTC facilities is regulated.
Family caregivers integrated as essential partners	Rather than being denied access to the patient for fear of virus transmission, family caregivers are integrated into direct personal care provision working alongside with professional caregivers and physicians as they best understand the patient's needs and values protecting patients from isolation during pandemics.
Adapting trans humanism	Transhuman being has the look of a human but with abilities beyond those of standard humans. With accelerating advancements into medical technology, the need to build onto the standard human intelligence has grown in order to fully utilize the potential of technological innovations.
Technology	
Rapid vaccine development & deployment programs	Advanced vaccine programs are established for rapid vaccine development and deployment in the event of future pandemics with a goal of increasing vaccine coverage rate. Challenges include enhanced patient access to vaccine technologies through public sector programs.
Virtual care is future of healthcare	Scientific and technological advances and radically interoperable data will transform the health care system we know today. Virtual health has the capacity to inform, personalize, accelerate, and augment prevention and care. This can allow for convenient, high-quality access to care that can enhance provider-patient interactions.
Telepresence robots replace healthcare workers	Advancing technology through robots can enable two way communication when the caregiver is not present. The goal is to facilitate communication using robots that can help combat loneliness among dementia patients, while also helping caregivers maintain a career, home and family life.
Adapting augmentative and alternative communication	Effective communication is essential at all times, especially during times of crisis to express needs, wants, and gather information. Using AAC can help dementia patients communicate without verbal expression. This facilitates inclusion in one's activities of daily living (ADLs).
Preprint servers for misinformation	Preprint servers for information circulation allows authors and researchers to put forth their findings in a rapid and efficient manner. The archive is online even though it is yet to be peer reviewed. Research during the pandemic can be published without verifying the analysis.

TREND	DESCRIPTION
Self-sufficient technology for LTC care	Assistive technology aided by AI helps people maintain their independence, safe and well-being by specifically being designed to compensate for their physical and cognitive functions. These technologies also provide carers the ability to support loved ones from a distance in case of an emergency.
VR Sensory experiences	These technologies are offered to adults for easy interaction during isolation and confinement that can trigger anxiety which only deteriorates the health. VR provides an escape from confined environments.
Neurotechnology	AI increases the ability of healthcare professionals to better understand day-today patterns and needs of the people they tend to by directly connecting to the nervous system. It is a growing trend to cure dementia.
Virtual data an asset	The Canadian Longitudinal Study on Aging has collected data of dementia patients over the past decade to make better informed decisions on how to support them. The data collected includes demographics, programs conducted, mortality rates, policies implemented and so on.
Artificial Intelligence	Independent corporations dedicated to AI research have collaborated with Alzheimer's Society of Canada and produced tools that allow repeatable, remote, and cost-effective assessment for dementia. AI helps in analyzing vast, unstructured medical data to give better insight into patient's needs.
Economy	
Insurance for intervention	Technological interventions are provided for a reformed life, cured of dementia. As insurance companies start offering intervention aid, more people apply for insurance upgrades to get maximum health benefits.
Two-tier healthcare system	The hybrid healthcare system involves a basic level of free universal healthcare and a second more robust level of better care with faster access that can be accessed through additional expenses.
Budget tracking and regulation	Ontario government can do better than just expanding resources within LTC homes by investing upfront in home care and support services similar to the services provided in LTC facilities.
Data analysis driven insurance	Insurance companies take strides to build digital platforms for people to buy insurance based on informed choice with respect to future pandemics working with data analytics companies that use AI to foresee the future.
Absolute privatization	Long-term care will be privatized on the incapacity of government to accommodate the rising needs of LTC facilities with a goal of keeping consumer needs as priority, facilitating the government to pay their debts while patients and staff are managed by an independent corporate power.
Wealth tax	Individual conglomerates take over the long-term care system in times of crisis. The biggest advantage of corporatocracy would be the ability to make quick decisions which is needed during a crisis.

TREND	DESCRIPTION
Businesses reimagine products for seniors	The crisis of a pandemic though personifies danger, also creates opportunity for established brand businesses to reimagine their products that can benefit dementia patients towards learning, personal aid and communication.
Environment	
Standardizing home care	Home care is standardized to ensure consistency in the type of care received keeping in mind evidence based results that can improve in-home care after due research upon standard dementia care provision.
Independent social environment	Older adults prefer to live in independence in technologically enhanced homes with no dependency on caregivers. Such living is enabled by models that will be more responsive, enable greater choice and engage meaningfully with the elderly.
Active seniors social environment	Seniors constitute onto a healthy social environment that can help examine and build environment-behaviours relationships in a community setting.
Sustainable natural environment	LTC facilities replicate home environment settings, building a healthy, natural environment in a LTC facility which incorporates familiarity and ease of being at home for a dementia patient.
Political	
Co-operative dementia centres	Both patients as well as staff hold part ownership in long-term care homes. The power retained during this agreement enables maximum benefits to all parties. The patients receive personalized, optimum care while staff receive benefits cordial with their efforts.
Multi-dimensional leadership	The government is inclined towards multi dimensional leadership to make strategic decisions that encompasses many dimensions including resilience, decision making, communication, empathetic evaluation etc.
Self governance in LTC home	In times of crisis, self governance takes the forefront as long-term care homes are decided best to understand the needs of their patient. This pushes LTC homes to make their own policies towards similar care provision for each patient when they need personalized care.
Multi-disciplinary expansion of government	Instead of bringing sudden increments in MOHLTC, gradual increments are proposed, reimagining the department as multi-disciplinary to provide for the varied needs of LTC homes during a crisis.
Expedited immigration laws	Policies are changed to expedite immigration laws to bring in foreign immigrant workers when the senior population overtakes caregiver population developing a crunch in effective care provision that has a magnified effect during a pandemic.

TREND	DESCRIPTION
Cultural	
Cultural reminiscence therapy	It builds back on the stronger memories of dementia patients which were created in their youth. This therapy is facilitated in a Montessori-based environment as part of LTC services where each cultural element exists for a reason, exclusive for the patient alone.
Online social community	The platform allows interaction between patients and community via digital tools that facilitate communication across all sectors of care. This helps in receiving and providing community care, support from varied sources through easy social media platforms.
Caregivers from the local community	Caregivers who are competent in care-provision are employed from the local community instead of bringing in migrants workers to provide for patients of varied ethnic diversities.
Participatory workshops during crisis	Workshops are held regularly involving caregivers, families of patients to build initiatives that address different health challenges. Participatory nature provides new way for user and relevant stakeholders by directly engaging with stakeholders to create swift action plans.
Self care	Seniors no longer require assistance or support from external resources and capable of handling the day to day activities of life on their own.

4.2   <u>Trend Matrix</u>

     The vertical axis consists of macro trends while aspects of time are charted as horizontal dimensions - formerly, currently and emerging. From STEEPC, the macro-trends Social, Technology, Economic and Culture are specifically chosen for further exploration for LTC environments since these macro-trends can be seen to undergo significant transformation over the proposed time periods. The recognized trends are sorted into respective matrix cells to show significant changes across the three time aspects.

Aspect *Macro-trend*	Formerly	Currently	Emerging
Social	Hierarchy in facility for risk communication (*WHO, 2020*) Empathy based treatment	Home care volunteers for LTC *(Terrell, 2020)* Empathic curiosity based care *(Cirillo, 2020)*	Family caregivers integrated into LTC regiment Growth in dementia effected individuals
Technology	Telephone services Tangible information communication Adaptive devices like hearing aids etc. Social media platforms (*SINTEF, 2011*)	Telehealth and other virtual care services Pre-recorded messages Video communication platforms *(Dening, 2020)* Connected homes *(Kulchar, 2020)*	Telepresence robots Augmentative and alternative communications Artificial intelligence Neurotechnology Self-sufficient technologies
Economic	Medication induced treatments Dementia friendly architectures *(Marquardt, 2020)*	Non-pharmacological treatment/service Dementia friendly environments *(Grennan, 2020)*	Data analysis driven insurance Budget tracking and regulation
Culture	Shift to social model from medical model *(Callahan et.al., 2012)*	Language translators Art & music therapy *(Blough, 2020)* Culturally competent care	Cultural reminiscence therapy Thriving social communities Participatory workshops during crisis

Detailed citations of 'formerly' & 'currently' trends are found in reference section. 'Emerging' trends are source from Trend Scanning.

4.3   <u>Generic Futures</u>

This method draws upon four alternative futures since there is no one true future that can be predicted (Dator, 2017). Projecting four equally consistent and plausible futures stimulates discussion on how the LTC system could react to external complex trends in four different ways with an aim to increase knowledge about the plausible futures (Fergnani, 2020).

The Generic Futures method is intended for envisioning four alternative futures for LTC homes and the possible paths of change associated with each. They reflect possible futuristic scenarios of LTC homes and question the default assumption that the future is present extended or repeated under similar circumstances of navigating through a pandemic. The four futures in this project offer an outlook into how LTC homes can evolve under growth (expanding care), collapse (care has collapsed), discipline (care is regulated) or transform (care is not needed). All scenarios are planned in 2035 and speculated under the assumption that a new viral pandemic, contagious in nature has affected the global human population, 15 years since the COVID-19 pandemic. The following table is drawn with the different alternative futures on the horizontal axis while macro-trends are listed on the vertical axis. The macro-trends are outlined from STEEPC to gain a holistic view of the environment in future. The table showcases trends from Trend Scanning method to inform and develop four equally plausible futures of how the year 2035 could pan out for long-term care provision. The selection of these trends is justified based on the impact they could create as forces of change on how care evolves for dementia patients in LTC homes in the event of a future pandemic. The Backcasting process associated with each future offers defined steps to attain the summarized vision of each future, set in 2035 thus, giving the power to work towards a preferred future.

Through the Generic Futures method the four alternative futures of LTC care are envisioned as:

- **_Expansion of LTC_** - LTC systems of Ontario expand their services beyond in-centre facilities to include home-based care services in an effort to progress. This will mean expanding care services, investing maximum resources for all STEEPV categories. Technology is developed at a new cheap, enabling more people to live to ripe old ages, adding growth to the elderly population.

- **_Care system has collapsed_** - Long-term care is no longer considered a viable system of providing care to seniors with a majority of people inclining towards home-care due to facility incompetencies that first emerged during COVID-19. This future disputes over the extent of decline of the system before measures can be reinstated to avoid complete collapse of care provision by integrating in-home care as an alternative.

- **_Care is regulated in LTC_** - In this alternative future, care refocuses on survival and fair distribution of resources. They are optimized for the benefit of all and conserved without excess growth. Technology enables to maintain a check by including care services from either facility based care or in-home care depending on severity of dementia. Though discipline does not mean forced obedience, pandemic regulates the necessity for such subservience during a time of crisis.

- **_Care is not needed_** - This imaginative future deems long-term care unnecessary for dementia patients as seniors transcend biologically into a second life where they do not require care support systems, having eradicated or controlled dementia disease through technological means. Their second life makes them valued members of the society even at an old age where they can use their experience and knowledge for the benefit of the society.

Future Macro-trend	Continuous Growth *Expanding care*	Collapse *Care has collapsed*	Discipline *Care is regulated*	Transform *Care is not needed*
Social	LTC network accessible to all Increase in dementia patients Delayed retirement age	Home care prevails over LTC Hospitals at home	Selective intake into LTC homes Family caregivers integrated as part of LTC regiment	Adapting trans humanism
Technology	Rapid vaccine setup Advanced virtual care AAC technologies Data asset strategy	Pre-print servers Artificial Intelligence Robots replace care providers	Self-sufficient technology Artificial intelligence	Neurotechnology VR Sensory experiences
Economy	Reimagine products Wealth tax	Absolute privatization Two-tier healthcare system	Budget tracking and regulation Data analysis driven insurance	Insurance for intervention
Environment	Seniors independent environment	Standardizing home care	Sustainable natural environment	Active seniors social environment
Governance	Multi-dimensional leadership Expedited immigration laws	Self-governance	Multi-disciplinary teams in the government for LTC planning	Co-operative dementia centres
Culture	Online community Participatory workshops during crisis	Home care prevails over LTC Employing local caregivers	Cultural reminiscence therapy	Self care

Scenario 1 - Continuous Growth Future

Continuous growth future focuses on developing the people, institutions, and technologies, enhancing the current state on a growth trajectory. The purpose of government, education, and all aspects of life in the present are to build a vibrant economy in the future, maintaining growth within the same status quo (Dator, 2009).

In a continuous growth future, better care is facilitated by making LTC facilities all-accessible and culturally inclusive, built for people across all ethnocultural groups, leaving no error for marginalization to any individual/group. Healthcare systems have enhanced efficiency in their processes since their failure in the last pandemic, with more proactive, rapid measures being taken in LTC homes, even before an at-risk population is determined. The senior population numbers have reached 1 billion and increasing, compared to the 700 million in 2020.

This future recognizes that dementia patients should have a say in their preferred place of stay as they grow older as this is critical to increasing their chance of living longer and happier. LTC system in this future invests equally in both facilities, as well as home-based care services. The optimal balance of expending on either service varies based on the community's demographics, cultural needs of patients, the cost-effectiveness of these services, and preference for a particular type of care.

Facility service models are based in long-term care homes placing patients in an inclusive array of socio-ethnic groups, which is in sync with their own ethnocentric needs. The limitation of the expressive communication in most dementia patients, are enhanced by direct communication through AAC technologies. These are digital high-tech systems (memory wallet, picture communication apps, modified typewriters to name a few) with an easy-to-use interface that can comprehend and speak for the patient, giving them a sense of independence and authority to state their needs clearly and concisely. Digital technology can also analyze the behavioural and habitual patterns of the patients to understand their recurring needs of patients. Patients are

encouraged to work with their preferred mode of technology to facilitate communication. The staff has built an inclusive mindset through training programs while receiving adequate pay for their services. Patient care is monitored and updated to the administration and families to ensure safe and secure care.

The LTC system provides In-home care services for mild-moderate levels of dementia as an external component of care provision allowing seniors to remain in the comfort of a familiar home. The benefits include culturally competent staff primarily aiding in periodic or live-in care depending on patient needs. Virtual care has expanded from the traditional system of receiving care into an interoperable platform that allows online virtual consultations, remote monitoring, and real-time interactive services with experts enabling hospitals at home. Hospital visits depreciate, leading to savings on long waiting periods, expensive in-hospital care treatments, and minimizing the possible risk of contracting the new virus.

Data collected from virtual care is valuable and handled by a data asset strategy, applying analytics to care delivery, aiding physicians to analyze evidence-based treatments that could suit their patients. With access to the health information on a secure network across different sources, clinicians gain better insight into patient's dementia progression, as each patient shows their own rate of deterioration. The data can be used for diverse computational analysis for testing rapidly produced vaccine formulas.

Seniors delay their retirement age so as to receive late retirement benefits which are invested back into LTC services when they are impacted by dementia to attend to their growing needs. To provide for facility-based and in-home care services for elderly, wealthier people of Ontario pay progressive tax, thus narrowing the growing gap between the rich and poor while simultaneously boosting benefits that can be rendered through the LTC system. The money collected from the taxes is invested back into businesses, granted as loans by the government

to expand their product line, reimagining commodities accessible and inclusive of the aged population.

A multi-dimensional leadership style is exemplified by the government that focuses on meeting the pandemic challenges by making strategic decisions in the context of constantly changing circumstances and parameters. An equal balance of rationality and compassion can build more robust policies that empowers leaders to lead with agility and fluidity. One of the policies focuses on easing immigration laws to bring in foreign healthcare workers to meet the growing needs of baby boomers. They are integrated into LTC services at both facility and home care as nursing assistants and healthcare aides after receiving formalized training.

An online, interactive platform helps patients to interact with the outside world to keep them in a healthy spirit, helping them stay connected to people beyond the walls of their home. Staff at LTC centers are provided with cultural education in a fun, interactive way to remember and appropriately deliver culturally sensitive care. The care strategy is determined by conducting participatory workshops inclusive of at least one person from each stakeholder group. This brings all the stakeholders to a shared path as they discuss the way forward that would benefit the purpose of providing care while keeping each stakeholder's best interests in mind. Equal, collaborative participation determines a strategy that can reimagine the culture of LTC.

BACKCASTING

2035

• Culturally inclusive and all-accessible system of LTC deploys rapid vaccination to both facility as well as in-home care patients with advanced communication strategies that effectively transmit information on the occurrence of a pandemic.

2033

• Independent environments are enabled at home for the elderly who choose to extend their retirement age by implementing advanced care service and communication technologies.

• Increased and safe remote outpatient monitoring for physicians is done through virtual care, potentially reducing hospital admissions and increasing patient satisfaction.

• Online communities for social connection welcome people of different cultures to interact with.

2030

• Strong data protection strategies are implemented to counter increasing cyber theft breaches so as to secure healthcare data.

• Immigration laws are eased to allow entry of foreign workers (as nursing assistants or home healthcare aides) to match rising number of culturally diverse seniors in the LTC system as nursing assistants or home healthcare aides.

• Rapid vaccine setups are formed for development, manufacturing, and deployment of antibody serums in event of either a pandemic or epidemic.

• Online means for social connections are established for patients using augmentative and alternative communication technologies.

2027

- Brand businesses reimagine memorable and prominent products for dementia patients. This has become mainstream as many companies draw inspiration from LEGO and other brands to reimagine their original products to target a senior demographic.

- Advanced virtual care technologies are introduced into long-term care services for patients to virtually connect with their care providers and receive personalized care.

- Elderly people delay retirement age to secure delayed retirement benefits that are invested into LTC care when they need physical assistance in daily activities.

- Technologies are developed that can accelerate vaccine medical research and clinical trials.

2025

- Ontario Ministry of Health and Long-Term Care extends its care provision policies to both facility as well as home-based services inducing new tax policies of progressive tax for the more affluent Ontarians to fund such services.

- Progressive tax is invested into businesses with disruptive ideas that reimagine everyday products for functional use of a dementia patient. Example, a timed aroma diffuser that delivers food aromas as mealtime prompter.

- Including patients as equal stakeholders, MOHLTC conducts participatory workshops with patients, testing select virtual care technologies.

- Online communication is established for selective group of dementia patients, experts and professional caregivers to facilitate communication.

2023

- The Government of Ontario induced a multidimensional leadership into Ontario Ministry of Health and Long-Term Care to approach problems with rational logic as well as collaborative empathy.

- Tech pitch competitions by MOHLTC encourages individual entrepreneurs and start-ups to come up with new AAC technologies that are easy-to-use, affordable and accessible by dementia patients.

- With United Nations predicting a two-fold increase in seniors aged 65 and above, there is an increase in medical school applications as more people lean towards gerontology, psychology, neurology, orthopaedics and associated disciplines of medicine that care for elderly.

2021

- In order to mitigate the severe effect of the virus on the elderly, complete lockdowns are ensured barring family and friends from visiting placing complete physical isolation of patients.

- Existing virtual communication technologies are brought under prime focus as the future of healthcare communication.

- Deliberation towards home care of dementia patients increases.

- Women-led governments such as New Zealand, Germany, Taiwan have shown greater resilience to COVID-19 pandemic.

Scenario 2 - Collapse Future

Before analyzing the collapse scenario, it is vital to understand that collapse is not to be emphasized as a worst-case scenario but instead focuses on a 'lower stage of development' (Dator, 2009). In the future scenario of collapse, adult foster care (AFC) and LTC systems have failed and are considered impractical for dementia patients during a pandemic. Instead, the focus is established on enhancing home care, bringing in facilities similar to the care and attention received in LTC homes. In-home care program is the new business for the golden age market, offering programs at competitive advantages ranging from periodic help offering cleaning and shopping to full-time assistance in ADLs. It is backed by a patient's desire to stay in familiar surroundings amongst family and friends, improving their mental health, a factor that is crucial for a mentally deteriorating disease such as dementia.

Standardizing this in-home care system deprives patients of social bonding and human interaction with there seniors in an LTC environment amongst other seniors. New technologies emerge to make up for this loss of interaction. Artificial intelligence is booming into virtual care services as it mines health data, analyzes, and predicts future care needed for the patient. Immune to human error, AI can diagnose the medical condition faster and provide palliative care for dementia patients through artificial empathy. Telepresence robots are popular in satisfying the communication needs of the patient when they feel isolated. The easy-to-use interface is customized explicitly for dementia patients with cognitive impairments to aid in virtual interaction with other people living within the same community or across the globe. Still, it predisposes their behavioural tendencies towards the virtual world, depriving the physical touch essential for care.

Data derived through computational analysis is published on pre-printing servers without peer review. The primary purpose of such repositories is to enable science-informed researchers to build onto their work. But its open-access information creates distortion in the public's understanding of science or gets overblown by media, building mass confusion. The

dominant and rising group of anti-vaxxers use this information to hold campaigns across the globe through the Omni-connected network to spread influence against vaccines. It not only increases the resurgence of already eradicated diseases but also circulates fear-induced misleading advice on how to deal with the new pandemic.

Countries across the world collaborate for vaccine development, sharing knowledge and experience. Collective health risks for the elderly are identified so that no nation faces catastrophes in their senior population's mortality. Economic and social costs are better managed such that each country has an equal stake in the final product.

Between rising technology and a collapsing economy, the Canadian healthcare system built many years ago cannot provide free healthcare for all citizens and moves into a two-tier system dividing the quality of care between the privileged and underprivileged. All LTC centers previously managed and funded under government capital are submitted to private companies to focus on pandemic pressures facing the rest of the country. A person-centric, service-oriented model turns into a business model, quoting higher expenses than in-home care, causing a shift in the standard of care that people receive. The absence of a regulatory body on the standards of care pushes LTC homes to provide evidence-based care to all patients instead of person-centric care. Private companies hire caregivers from the local community to increase local patient intake into LTC. Still, growing diversity due to globalization makes it difficult to tend to the varied cultural needs expected of a patient, which in-home migrant caregivers of similar ethnicity can substitute.

BACKCASTING

2035

• LTC homes are rendered expensive, autocratic and risky. Home care is strengthened by employing regional caregivers, and deemed absolute self-sufficiency that can be traversed through the virtual world.

• A single vaccine is generated by a country, placing pressure on vaccine manufacturing forces. This can also pose serious challenges of affordability for low- and medium- income countries, especially for under privileged people in those countries.

2032

• Vaccine manufacturing capacity of third world countries is almost negligible.

• AI enhances care and support for dementia affected patients receiving care from home by remote monitoring of person's behaviour.

• Under the two-tier system, the long-term care homes are perceived to be a luxurious service and unaffordable to the non-elite. It forms a divide between the privileged and non-privileged members of the society.

• Acute care hospital services are managed from home through technology. Physicians can treat their patients where they are most comfortable and assess their living situation before considering care tactics.

2027

• Pre-print servers spread unverified data about dementia care on the Internet which gets overblown in social media through self-interpretation.

• Developers figure out how AI can use past medical and behavioural data to determine if an individual might develop dementia in the future and the best form of care.

- Governments individually increase their vaccine manufacturing capacities by bringing in immigrant scientists as part of their workforce.
- Telepresence robots are integrated into patient's lives for better connect with people and receive comprehensive virtual care services.
- To accommodate any shortcomings of in-house care, private long term care homes are introduced in order to monetize on such a situation.

2025

- As telehealth services have increased health benefits compared to in-person care, LTC services are expanding into remote care provision through virtual mediums.
- After achieving successful trials in AI treatment for dementia care, laws are brought into effect to avoid misuse of sensitive medical data.
- WHO conducted an analysis of vaccine manufacturing capacity of each country resulting in the top five superpower countries as leaders in vaccine production capacities.
- One-tier healthcare system offered by the Government, proves expensive for LTC which leads to them standardizing in-home care.

2022

- Vaccines are provided to 60-70% of the population bringing the curve to an almost zero; almost, owing to resistance from anti-vaccine groups lobbying against artificial means of immunization.
- Ontario Government partners with Alzheimers Society to develop AI research for dementia patients to be integrated into LTC facilities.
- Unreliable scientific information spreads fast as pre-print servers rapidly share findings with ease, making resources accessible across the globe.

2021

- In order to mitigate the severe effect of the virus on the elderly, complete lockdowns are ensured barring family and friends from visiting placing complete physical isolation of patients.

- Staff and healthcare professionals start adapting to new technologies to assess condition of patient or to communicate with patient about their needs.

- COVID-19 vaccine takes too long to be deployed.

- Government faces harsh criticism on the world stage as it attains the worst record among developed nations in the wake of patient deaths that ensued in LTC homes.

Scenario 3 - Discipline Future

The third alternative future is discipline which arises when the future of continuous growth is considered undesirable or unsustainable. Though such change is often regarded as necessary to end the various wicked problems on this planet, it is crucial to be mindful that the resources we have are only finite with an increasing population. Even with the advent of new technologies that enable us to thrive, continued growth may come to a halt as we run out of available resources to fuel our everyday lives. Thus, the argument of the third future is to focus our economy and society on survival and equity while following a set of fundamental values (Dator, 2009).

The care offered to dementia patients in the discipline future is regulated by restricting LTC facility access to a limited number of people on a triage system of admission. Admissions halt once the maximum capacity in a long-term care facility is reached. The remaining people are encouraged to take up self-sufficient technology-aided in-home care until a patient voluntarily discharges or numbers decrease for any reason(s). This method allows for effective use of resources for patients in most need of professional care due to complex or rapidly deteriorating conditions and provides optimum safety to onboard patients during the pandemic crisis. This care system is standardized with immediate effect once GIS and data analytics systems declare a potential pandemic outbreak. As essential partners with LTC services, family members are integrated into care provision after appropriate training.

In the moderate stage of dementia, people lose their ability to recognize familiar places or faces. Information and communication technology are incorporated in LTC facilities to monitor a patient's navigation path to limit their movement, mitigating pandemic spread. It stimulates a sense of independence in patient while also protecting them from self and people around them.

LTC system introduces self-sufficient technology - assistive technology-aided through AI, to maintain the well-being and safety until he/she is eligible to move to a long-term care facility. The technology is specifically designed to tend to their own basic physical and cognitive functional needs. When such a design incorporates AI, it can enhance regular assistive products with powerful features. It brings about the potential to help people impaired with vision, hearing, mobility, cognition, and learning disabilities, whether temporary or permanent, to lead a better quality of life. With such significant equipment on hand, patients are provided the freedom of independence through AI.

Financial investment into such technologically enhanced services can be expensive to maintain, even by the LTC system, which indirectly places pressure on patients to pay for the services rendered that their insurance companies cover. These companies use AI-driven predictive analytics to provide people an informed choice when choosing an insurance plan. The financial budget allotted by the government is managed by upfront investment into in-home care services and LTC services alike. Home-care is comparatively cost-efficient to a residential care setting for both patients and government revenue, with lesser investments made into home-care services.

Facility-based care focuses on developing a sustainable environment by replicating the feeling of being at home. Incorporating natural, familiar elements in the immediate environment promotes the health and recovery of a dementia patient who needs familiarity in an unfamiliar backdrop of a nursing home.

In anticipation of a crisis, the government has slowly but constantly reimagined and expanded the government in small increments since the COVID-19 pandemic resulting in formation of multi-disciplinary teams for the Ontario Ministry of Health and Long-Term Care. With the arrival of the new pandemic, the steady expansion has developed trust amongst the public as they see gradual efforts being put into the system of LTC. This slow expansion of

government is mindful of any new developments in the immediate or external environment. Such a reverse ratchet effect takes meticulous care to pause, comprehend and provide better administrative services in the system of long-term care.

Non-pharmacological treatments are in the forefront to support the cultural needs of the patient. Care is focused upon reminiscence therapy that deep dive into a patient's stronger ethnocultural memories through different forms of art. This transpires in care services that use Montessori education methods to offer patients with mild exercises that focus on their individual abilities and needs.

BACKCASTING

2035

• Care is regulated in LTC homes by limiting intake of dementia patients into a sustainable environment where the number of professional caregivers is limited, enlisting family as essential caregivers. The remaining patients are equipped with self-sufficient technology for in-home care under their own expense.

2032

• Recurring mandatory inspections of dementia patients blending with self-sufficient technology

• Professional caregivers are assigned to work with only limited number of patients, developing intimate tacit knowledge on needs of dementia patient.

• Increasing demand for self-sufficient technology entails large scale manufacturing.

2029

• More people take insurance policies framed using data driven analytics for health benefits when they move into a LTC facility or to purchase technology to improve care from home.

• Mandatory training is authorized by MOSHWA for family members to take care of dementia patient as essential caregivers in LTC facilities.

2026

• With a restricted budget, MOSHWA only provides for nursing and personal care of patients under Senior Healthcare. Advanced technology based services and accommodation costs are charged to the patients.

• Workshops are conducted to ensure coordination between family caregivers and professional caregivers catering to multiple patients.

- Private insurance companies partner with data analytic companies to predict future health disasters in shaping their policies.

- BRIDGES Canada, a leading manufacturer of assistive technology in Ontario integrates the technology with AI to introduce self-sufficient technology for benefit of senior population.

2024

- The government rebrands MOHLTC into Ministry of Senior Healthcare and Wellness Aid (MOSHWA). This department assumes a multi-disciplinary approach as the government oversees both facility as well as in-home care.

- Sustainable environment in facilities is built on evidence-based design principles in managing patient accessibility and mobility.

2022

- The government of Ontario has drawn sustainable goals post LTC failure in protecting its citizens. These goals are aimed at insulating Ontarians who have been adversely affected in LTC system due to COVID.

- LTC homes aim become for a safe space within a nursing facility for people to live, work and visit, both physically and mentally. This is done so by acknowledging and addressing the structural problems in terms of underinvestment, staffing and safety.

2021

- The government has strictly enforced complete lockdown measures in LTC homes to stop explosive COVID growth amid rising pandemic numbers and failing citywide lockdown measures.

- There is a high dependency proportion of the elderly to working-age adults. This is a signal for great social and economic burdens on the working-age population.

- Unexpected arrival of pandemic and added pressure to already under-staffed, under-resourced system of LTC creates additional demands for effective government intervention.

- Families of residents are considered as essential and can be integrated for care provision of their family member.

Scenario 4 - Transform Future

The fourth future focuses on technology that can radically bring a change within the system, welcoming a profound transformation of all life, including humanity, from its current form to a 'post human' form. As incredible as it may seem, if this change can be nurtured, the experiences and values would never have been achieved before on a global scale. This future has great potential for creativity and conceiving essential work over meaningless make-work for human labor and intelligence (Dator, 2009).

This alternative future leans heavily on technology (digitally accentuated) that has significantly progressed over the past couple of decades to transform the perception of dementia. The innovations that come up no longer mandate the need for care to a person diagnosed with dementia. Neurotechnology has dramatically advanced over the past decade, allowing a seamless integration of brain-computer interface that provides a cure for dementia subjects by allowing communication between brain and machine. With a brain-machine interface, it is possible to write data into the nervous system and sync the neural language with machine language. As a bi-directional activity of commands transpires, it results in improved neural healthcare, memory reminiscence, and enhanced intelligence, eliminating them from the category of 'patient.'

Over the same period, computing power has doubled once every five years, leading to higher machine intelligence than the average human brain. Trans-human projects are initiated with seniors to help them make sense and adapt to growing technological advancements. With enhanced minds, seniors are no longer in need of help/support from the community. Instead, their role is reimagined as they return to the community or revert to any unfulfilled goals. They start a 'second life,' perceived as essential and elemental, instead of a burden to society. In this phase of life, seniors are at the core of society. With their extensive experience and knowledge, they create a positive social environment promoting acceptance, diversity, and instilling courage

in difficult times of pandemic. Under such a positive environment, long-term care homes are reimagined as Social and Mentorship Centres, commonly called SMCs, which become mental refuge centres for the general public.

Greatly improved by technology, digital enhancements in the lives of seniors amplify external surroundings by virtually displacing them from within the four walls of a home to anywhere on the planet or even imagination. Artificial environments are created during the pandemic through advanced VR immersive technologies controlled and manipulated according to the needs of seniors to continue providing services at the SMC.

With such technologies becoming popular for a chance at a second life, they become more accessible to people who can afford them. Insurance companies include such services in their coverage plans. With insurance covered, more seniors start adapting and integrating technology into their life.

These SMCs are no longer solely owned by a corporation or government. They are autonomous and jointly owned by different stakeholders within the system, primarily seniors and administrative staff. They enter a co-operative agreement under the terms of receiving democratic control of the system and maintaining co-operative autonomy.

The culture within an SMC undergoes significant cultural transformation to one dominant culture of self-care. With a free mindset that old age is now a valuable and respected age in society, elders focus on taking care of themselves and caring for others. A successful transformation is achieved by complete engagement and aiming for the common goal from all levels of leadership throughout the system.

BACKCASTING

2035

- The elderly population start a 'second life' by adapting to trans humanism at Social and Mentorship Centres widely spread across Ontario with support from the government. These SMC's are technologically enhanced through VR simulations, creating an artificial safe environment that promotes social activity and self-care by practicing safe distancing protocols even during a pandemic.

2031

- Self-care is a new and growing trend ranging from young adults to senior citizens, driving consumer sales for self-care products.
- As trans humanism is rapidly adopted amongst the elderly population, insurance companies provide medical benefits for seniors to choose insurance for intervention to eradicate dementia through trans humanism.
- SMC's start growing into mentorship and advice hubs across Ontario by volunteering to coach young adults based on their experience and wisdom.

2028

- Human Rights activist groups quote 'Article 5: Right to liberty and security' as a valid argument against Neuralink which can potentially make a person vulnerable to hacks and other malicious attacks.
- Immersive VR technology takes over social media connecting people across the world, driving towards cultural correspondence and connections.
- Fast growing technologies are not easy to integrate for the feeble minds of dementia patients. Trans humanist trials are initiated to eradicate dementia.

- MOHLTC is reintroduced as Senior Management and Guidance Department in the government of Ontario, sharing co-authoritative administration with a committee of seniors.

2025

- Neuralink achieves success in testing the first human subject achieving brain-machine interface. The company partners with Ontario Brain Institute to promote and enhance early stage neurotechnology for improved brain health.
- VR technologies that are prominent in gaming and entertainment industry expand towards augmenting social lives with seniors are primary stakeholders.
- Machine intelligence has surpassed human intelligence prompting Neo-Luddite groups to rise against advancing digital technologies.

2023

- There is an accelerated rise in the adoption of innovative technologies such as VR and telepresence which would have taken years to become mainstream.
- With Neuralink success on living subjects, neural health is now an effervescent subject of exploration for neuroscience startups, including neuroprosthetics, neurolinguistics, neurogenesis etc.

2021

- In order to mitigate the severe effect of the virus on the elderly, complete lockdowns are ensured, barring family and friends from visiting, placing complete physical isolation of patients.

- A considerable, drastic shift is seen from analog to digital way of life as patients, staff and healthcare experts shift to technological means to interact with other people or external environment.

- Government faces harsh criticism on the world stage as it attains the worst record among developed nations in the wake of patient deaths that ensued in LTC homes.

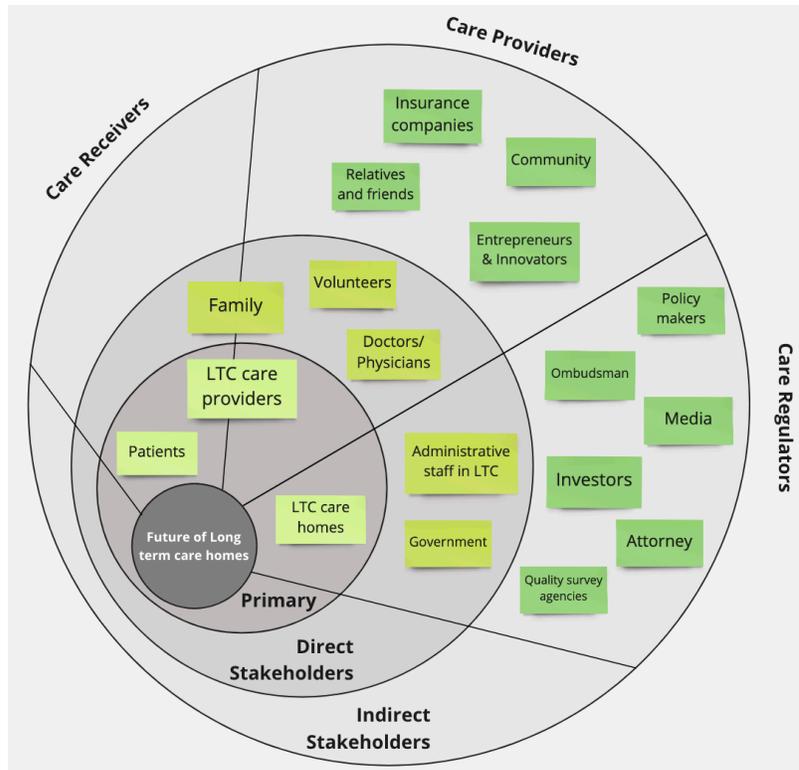- Neuralink Corporation starts neurotechnology trials on living subjects.

4.4   Stakeholder Mapping

A mapping process identifies and classifies the large number of stakeholders involved in the LTC system. Stakeholder mapping was done for this project to identify the primary users who were mostly affected during the COVID-19 pandemic, instead of providing proposals to each stakeholder from the map below. Proposals are drawn specifically for these primary users identified within a LTC home environment. For this research, the following map shows stakeholders categorized in the three respective fields of care provision - care receiver, care provider, and care regulator. The first level of divide identifies primary, direct, and indirect stakeholders:

Primary users: Being the epicentre of the LTC system, any business, product or service-related decisions are made to their immediate benefit.

Direct stakeholders: These people must always stay up-to-date with the latest developments, as their contribution is highly impactful.

Indirect stakeholders: They are indirectly associated with long-term care provision and cannot be controlled to serve the purpose. Proposals are provided for these three primary users identified in each field.

5 INSIGHTS

From the two foresight methods used in this research project - Trend Matrix and Generic Futures, insights are gathered for taking the LTC into a preferred future to which recommendations are provided.

Insights from Trend Matrix -   From the Trend Matrix table, the significant impact of emerging technology on other macro-trends is recognized. The rapid rate at which technology is growing leads the world into an era of digital transformation and *Omni-connectivity* that has a consequent effect on all facets of human life. The overview indicates how advancing technology is causing a considerable shift in cultural, personal, and business motifs. The technological convergence of media and the Internet of Things into everyday lives has translated a societal shift towards building an era where there is a disruption of the traditional lifestyles of living and interaction.

This pandemic has seen one of the most significant disruptions in people's lifestyles since its arrival, which has forced people to remain in solitude, causing an extensive burst in technological innovations that could help people stay connected. The capacity to embed technology and the internet into literally anything and everything, including the floor, clothing, beds, even as simple as a toothbrush, is a growing trend. Applying the same within the LTC system, there is renewed interest in innovative technologies to improve care for the elderly. Innovations expand into the environment, physical design, and social interactions that can determine care experienced by seniors. Communication platforms have picked up, primarily to improve patients' mental health isolated from other humans and to manage efficient functioning between patients, medical experts, professional caregivers, and administrative staff. Learning programs are developed for patients to provide information about the pandemic and train staff on managing patients during the pandemic. Technology can communicate and receive input

from dementia patients for research and development purposes to better provide for their needs.

Though the Trend Matrix method reveals technology as an appropriate direction for prospects, deeper perspectives are gained from shaping future scenarios through the Generic Futures method. These scenarios are speculated as different images in the not-so-distant future, each providing valid initial premises, data, and projections that could deem any one of the four as plausible outlooks for the evolution of the LTC system by the year 2035. Through this method, unique perspective angles have been revealed that can be utilized by the long-term care system today.

Insights from Generic Futures

Vulnerabilities Uncovered - The COVID-19 pandemic has exposed deep flaws within the LTC system that makes them vulnerable to a disruptive event. Speculating a detailed, clear future is needed to cover any fractures within the system well in advance by using the Generic Futures method. Considering all vulnerabilities that are uncovered from each scenario, a robust future is built on the preferred future of 'continuous growth' where patients in the LTC system are no longer defenceless against a raging pandemic with weak and inconsistent aid.

Big Bets - Throughout the four futures, implementation and growth of transformative technologies can be seen to have the competency to induce metamorphosis in care provision. As future growths suggest, LTC systems have high capacity for expansions and there is growing need to re-engineer and automate end-to-end processes to reduce pressure on resources. Digital technologies can be diverse and disruptive, creating enormous opportunities for both existing and new models of care, disrupting business models, products and services. This

disruption can be achieved if LTC systems looks beyond its legacy systems which act as potential barriers in responding to disruption at the fast changing pace of the world.

Mega Opportunities - Mega opportunities are defined as immediate major development projects that can be undertaken to increase efficiency of the system. The biggest opportunity that was identified is the importance of home care and the positive impact it can create on a person suffering from dementia. The independent lifestyle of a patient can be structured such that in-home services are reimagined to be person-centric, revolving around needs of patient and family caregiver(s).

From the above elemental summary, it can be surmised that the profound radical change from the Transform Future might be excessively inconceivable given the short period of time to 2035, while the current pandemic has already highlighted debacles associated with the Collapse Future. There is considerable potential to work upon and expand towards the Growth Future keeping in view of major shifts already happening in the immediate environment of LTC due to COVID-19 pandemic. Coupling with insights gained from this with the high level direction of technological impact provided by the Trend Matrix, proposals are provided accordingly.

6   PROPOSALS

From the insights gathered above, the following proposals are submitted for the primary users - dementia patients, caregiver and LTC facilities. These proposals are not to be considered as absolute future outlooks but more of recommendations for the efficient care of dementia patients in the LTC system in Ontario.

Patient: Rethinking technologies for an independent way of life

***Sensory Technologies*:** Technology is opening up many avenues for the future in dementia care, including most patients who tend to have an aversion to digital screens or gadgets. As sensory technology transcends new boundaries, investing in it will enable dementia patients to explore unique sensory experiences not limited to vision and hearing but also smell and touch. This enhancement can refocus on supporting social interaction and communication during a pandemic. It will also assist in assessing and managing behavioural and psychological symptoms that develop in later stages of dementia. Building a sensory-enhanced environment using IoT creates an efficient environment for interconnectedness that allows safety and security over the well-being of a dementia patient.

***Virtual Care*:** As telehealth emerges as a viable method of expanding healthcare service, various Omni-connected channels emerge that bring all service providers and receivers under one platform. Though the concept is not new, it has advanced considerably during the pandemic. Improved triage and patient care management, better access to primary care, remote patient monitoring, and intensive care can optimize prospects for virtual care. Big data generated as a result of improved virtual services requires extensively managed and secure strategies to improve the virtual services provided.

Caregiver: Building an efficient communication channel with assistive technologies

Effective and efficient communication channels are paramount, especially in a time of crisis. It is vital for everyone to have access to updated and important information. Augmentative and alternative technologies have been proven effective to communicate with dementia individuals who face significant communication challenges. It is encouraging to see as technology continues to progress in assisting people who are non-verbal or minimally verbal. Digital AAC technologies can be enhanced through AI technologies, creating favourable circumstances for communicating with dementia patients. In an effort to tend to people who are digitally averse, Artificial Intelligence of Things provides a solution. Caregivers are a dementia patient's immediate and closest contact to the outside world. An efficient communication channel can be built by providing training in these technologies to the caregivers.

LTC Homes: Establishing harmony through technological systems

Investments in technologies that support and boost systemic processes are critical to efficient functioning of the complex system of LTC. The interplay between patients, caregivers, experts physicians, LTC shareholders, technologies etc. becomes more complex and erratic in the time of crisis. By integrating technological systems in the smooth functioning of the various communication processes within a LTC home, it develops a core hub that integrates all technologies, migrating manual processes to automated solutions without further human input. Irrespective of the scale of facility, data can be collected, interpreted and analyzed even through remote monitoring. An automated system provides resilience even during a crisis. Any information that concentrates in the hub must be safeguarded by effective data management strategies.

7   CONCLUSION

From this project, we concur and highlight the need to advance long-term care methodologies of providing care to dementia patients. The paper takes the form of a draft research statement complete with selected proposals for a future approach. The proposals outlined in this paper have emerged from research conducted on dementia care, synthesized into various foresight methodologies.

Dementia is a substantial health concern with extensive research built over time on how competent care can be provided. The COVID-19 pandemic has forced people to be socially isolated, making them heavily dependent on technologies, not just for their entertainment but also for healthcare and safety reasons. Considering the current social and economic scenarios, this research paper touches upon recent technological innovations to foster and improve healthcare methodologies. A significant need for change at all levels of governance is recognized as a key factor to address the challenges in long-term care homes during a pandemic.

Alternative futures developed for this project serve as scaffolding to help individuals to construct a model of the LTC system and how it could evolve since the pandemic is a highly dynamic and radical phenomenon that challenges foresight studies.

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APPENDIX - TRENDS

1. Hospitals at home

Home-based treatment programs are boosted by developments in remote monitoring and wireless communication. Providing support for home care helps the elderly stay amid loved ones for a prolonged period, drawing back to the fundamentals across many cultures of looking after the elderly in the family.

Implications
- Smart-home technologies gain forefront to assist in the needs of people with dementia.
- Candidates who may be facing complex or multiple medical conditions will need new and advanced developed technology that requires complicated procedures.
- These programs serve as educational programs to understand how and why home-care can be adapted further down the lane.
- Hospital services requiring professional expertise become ambulatory.

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2. Virtual care is future of healthcare

Scientific and technological advances and radically interoperable data will transform the health care system we know today. Virtual health has the capacity to inform, personalize, accelerate, and augment prevention and care. This can allow for convenient, high-quality access to care that can enhance provider-patient interactions.

Implications
- Allows dementia patients to remain in the comfort of their own homes for longer period of time until they require full time assistance from LTC homes.
- Investments made into more home-care services will eventually curb the LTC business.
- Direct communication can be established between care providers, families and patient, with no interference from management, reducing any confusion in the communication process.
- Advancing technologies can impede the wait time for procuring appointments with care providers.

Signals

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3. Telepresence robots for interactive communication

Advancing technology through robots can enable two way communication when the caregiver is not present. The goal is to facilitate communication using robots that can help combat loneliness among dementia patients, while also helping caregivers maintain a career, home and family life.

Implications
- Effective communication in isolation reduces the spread of virus.
- Constant vigilance over dementia patients with advanced dementia can be maintained even under isolation.
- Robots help people to stay longer in their homes rather than live in a LTC setting.
- Advancing technologies are assessed for taking up challenges of larger capacities that can come up during a pandemic.

Signals

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4. Cultural reminiscence therapy

It builds back on the stronger memories of dementia patients which were created in their youth. This therapy is facilitated in a Montessori-based environment as part of LTC services where each cultural element exists for a reason, exclusive for the patient alone.

Implications
• Culture plays an important role throughout the lives of people.
• Exclusivity maintained through these activities focuses on person-centric care.

Signals
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5. Adapting augmentative and alternative communication

Effective communication is essential at all times, especially during times of crisis to express needs and wants, and obtain important information. Using AAC can help dementia patients communicate with just facial expressions or gestures instead of talking. This facilitates inclusion in one's activities of daily living (ADLs).

Implications
• Language is not seen as a necessary tool to communicate needs/wants.
• Caregivers adapt to different forms of communication contrary to the traditional ways of speech, hearing and sight.
• Video and audio calls pose barriers to communication with dementia patients such as staff attitudes and possible turnovers, lack of family commitment, being technologically incompetent etc.

Signals
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6. Family caregivers integrated as essential partners

Rather than being denied access to the patient for fear of virus transmission, family caregivers are integrated into direct personal care provision working alongside with professional caregivers and physicians as they best understand the patient's needs and values protecting patients from isolation during pandemics.

Implications
• Better mental health positioning when dementia patients spend time with family caregivers
• Clear communication channels are better established through direct communication involving patient, family and professional caregiver.
• Care provision is better monitored with added help.

Signals
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7. Insurance for intervention

Technological interventions are provided for a reformed life, cured of dementia. As insurance companies start offering intervention aid, more people apply for insurance upgrades to get maximum health benefits.

Implications
• The stigma that old people and technology do not mix well together is broken bridging stronger relations amongst different age groups as equals and not dependents.
• With more seniors accepting technology to shape their lives, the generation is slowly transformed, making them more capable to contribute to the society.

Signals
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8. LTC network accessible to all

Inclusivity is the new exclusivity as long-term care homes build an inclusive but diverse community within care homes instead of being portrayed as a service provision business. The diversity is not limited to cultural boundaries but also eliminate any physical barriers to accessibility through new age tech and improved architecture models.

Implications
- Ethnic nursing homes gain popularity to tend to needs of the culturally diverse people with dementia.
- Architecture and design inclined to make spatial areas within LTC homes more dementia-friendly.
- Technology plays varied forms of bringing an accessible and inclusive environment. Example, telehealth services, telepresence robots etc.

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9. Home care over LTC

Long-term care homes are no longer accepted in Ontario as a potential setting for the elderly in need for services of care dropping occupancy In nursing homes. Limits to taking care of loved ones are traversed through growing technologies and adaptive procedures of treatment.

Implications
- Telehealth services would gain popularity for home care.
- LTC homes run out of funds obtained from care provision to patients.
- A cohesive family environment is built which allows the residents with children to spend more time amongst family while children fulfill their responsibilities.

Signals

Signals

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10. Selective intake into LTC based on triage

During health catastrophes, triage care offers priority to those patients who present with more complex needs than those who do not need immediate care. Based on these factors, population of residents in LTC facilities is regulated.

Implications
- LTC facility resources are provided only for patients within the facility in an effort to provide optimum care for those already under the responsibility of the care home.
- Triage protocols could cause potential 'moral distress' amongst healthcare providers knowing the limitation of resources available during a pandemic.
- Patients who do not make it to the triage list to receive LTC facility care are supported by self-sufficient technologies in in-home care.

Signals

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11. Rapid vaccine development & deployment programs

Advanced vaccine programs are established for rapid vaccine development and deployment in the event of future pandemics with a goal of increasing vaccine coverage rate. Challenges include enhanced patient access to vaccine technologies through public sector programs.

Implications
- Vaccine awareness programs to be initiated at the same momentum as the vaccine development program.
- Countries working cohesively to share research under global health crisis to achieve faster results in developing a vaccine.
- Building efficient systems of harmony and transparency can result in rapid research, approval, mass production and public accessibility.

Signals
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12. Preprint servers for misinformation

Preprint servers for information circulation allows authors and researchers to put forth their findings in a rapid and efficient manner. The archive is online even though it is yet to be peer reviewed. Research during the pandemic can be published without verifying the analysis.

Implications
- The fear that people carry during the pandemic can be enhanced through misinformation and misleading advice on how to deal with the pandemic
- Quicker results on research can be published and propagated during pandemic.
- Media plays an active role in removing misinformation from reaching common folk.

- Preprint allows for rapid dissemination of data that could potentially inform research in producing vaccines and treatment for the virus.

Signals

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13. Two-tier healthcare system

The hybrid healthcare system involves a basic level of free universal healthcare and a second more robust level of better care with faster access that can be accessed through additional expenses.

Implications
- The Canadian healthcare system built many years ago does not hold valid to current system and can collapse in the next pandemic.
- The system could bring a divide in the system - for the affluent and for everyone else.
- Higher, second-level care could bring inferior quality of care to the lower level of care for all.
- United States is not longer second-tier for Canada since the country develops its own two-tier system.

Signals

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14. Self-sufficient technology for LTC care

Assistive technology aided by AI helps people maintain their independence, safe and well-being by specifically being designed to compensate for their physical and cognitive functions. These technologies also provide carers the ability to support loved ones from a distance in case of an emergency.

Implications
- Usual support and care can be provided to patients through means of technology even during crisis that mandates distancing.
- Independence and social connections maintains a patient's mental health, hence slowing down the progression of the disease.

Signals
"People with severe dementia are unaware of COVID-19 outbreak, indicates study." (2020, September 21). Retrieved from https://www.news-medical.net/news/20200921/People-with-severe-dementia-are-unaware-of-COVID-19-outbreak-indicates-study.aspx

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15. VR Sensory experiences

These technologies are offered to adults for easy interaction during isolation and confinement that can trigger anxiety which only deteriorates the health. VR provides an escape from confined environments.

Implications
- Ability to see and hear loved ones
- Positive impact on patient's mental health keeping them calm and anxiety-free
- Endless possibilities to explore both real and imaginary.

Signals
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16. Absolute privatization

Long-term care will be privatized on the incapacity of government to accommodate the rising needs of LTC facilities with a goal of keeping consumer needs as priority, facilitating the government to pay their debts while patients and staff are managed by an independent corporate power..

Implications
- Long-term care businesses improve their standards to lean people away from home-care.
- Autonomy to LTC homes makes them unanswerable to mismanagement and neglect.
- Government becomes further invisible in the perspective of citizens as to their role in taking care of the elderly.
- During a pandemic, the lives of dementia patients in LTC home can be seen clearly and distinctively.

Signals
Green, R. (2020, April 14). *Privatization, the pre-existing condition killing seniors in long-term care.* Retrieved from https://ricochet.media/en/3043/privatization-the-pre-existing-condition-killing-seniors-in-long-term-care

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17. Budget tracking and regulation

Ontario government can do better than just expanding resources within LTC homes by investing upfront in home care and support services similar to the services provided in LTC facilities.

Implications
- Residents can remain in the comfort of their own homes for longer period of time before they require acute care provision for ADLs.
- It would decrease pressure on national budget investment in LTC facilities as home-care has considerable lesser costs compared to facility-care.
- Governments can invest their resources in devising new policies around regulating and building on a system of person-centric home care instead of expanding resources for LTC facilities.

Signals
Ho, S. (2021, January 21). *Doctor says Canada underfunding long-term care amid call to end for-profit homes.* Retrieved from https://www.ctvnews.ca/health/coronavirus/doctor-says-canada-underfunding-long-term-care-amid-call-to-end-for-profit-homes-1.5276392

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18. Data analysis driven insurance
Insurance companies take strides to build digital platforms for people to buy insurance based on informed choice based on future pandemics by working with data analytics companies that use AI to predict the next pandemic.

Implications
- AI predictions for the next pandemic drives more people to buy insurance
- Insurance companies and AI form partnership health companies for integrated user potential.
- Insurance transposes from 'detect and repair' to 'predict and prevent'.
- Employing AI can contribute to reshaping claims, distribution and pricing.

Signals
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Deschamps, T. (2020, April 1). *Coronavirus prompts some Canadian insurance companies to go digital.* Retrieved from https://globalnews.ca/news/6763396/insurance-companies-coronavirus-virtual-care/

19. Standardizing home care

Home care is standardized to ensure consistency in the type of care received keeping in mind evidence based results that can improve in-home care after due research upon standard dementia care provision.

Implications
- Not all people with dementia have same symptoms with similar progression of disease. It would not benefit the patient to provide evidence-based home care compared to care that is centric to their needs and values.
- This eliminates the plausibility of person centred care which is necessary for dementia progression with each patient experiencing differentiating levels of dementia.
- Cultural factor becomes a diverse variable for evidence-based research on standardizing home care. This would not provide positive results in a culturally diverse city like Toronto.
- Designing a standardized home care system would require diverse group of people to cater to multitude of needs. A general consensus would tax more of time and resources.

Signals
Monsen, K. A., Foster, D. L., Gomez, T., Poulsen, J. K., Mast, J., Westra, B. L. & Fishman, E. (2011, September 21). *Evidence-based Standardized Care Plans for Use Internationally to Improve Home Care Practice and Population Health.* Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3631934/

Khouli, H. (2020, December 9). *Standardizing Care for COVID-19 Patients Saves Lives.* Retrieved from https://newsroom.clevelandclinic.org/2020/12/09/standardizing-care-for-covid-19-patients-saves-lives/

"Toronto Dementia Research Alliance finds new home and leadership at CAMH." (2020, October 9). Retrieved from https://www.camh.ca/en/camh-news-and-stories/tdra-finds-new-home-and-leadership-at-camh

20. Independent social environment

Older adults prefer to live in independence in technologically enhanced homes with no dependency on caregivers. Such living is enabled by models that will be more responsive, enable greater choice and engage meaningfully with the elderly.

Implications
- Social interaction and reliance grows into the community network.
- Greater confidence is developed in the elderly to take care of themselves.

- New products are introduced that make independent living easy
- Systems accommodate to the rising needs of independently living elderly.

Signals
National Institute on Ageing. (2019). Enabling the Future Provision of Long-Term Care in Canada. Toronto, ON: National Institute on Ageing White Paper.

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21. Co-operative dementia centres

Both patients as well as staff hold part ownership in long-term care homes. The power retained during this agreement enables maximum benefits to all parties. The patients receive personalized, optimum care while staff receive benefits cordial with their efforts.

Implications
- Care providers can expand their access and capacity in providing geriatric care.
- This method could be more cost effective for patients given lower hospitalization.
- Shared responsibility and member contribution is encouraged from co-operatives that makes each person liable towards the collective decisions made.

Signals
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Armstrong, P., Banerjee, A., Armstrong, H., Bradley, S., Choiniere, J., Lowndes, R. & Struthers, J. (2019, April 15). *Models for Long-term Residential Care.* Retrieved from https://www.toronto.ca/legdocs/mmis/2019/ec/bgrd/backgroundfile-130891.pdf

22. Multi-dimensional leadership

The government is inclined towards multi dimensional leadership to make strategic decisions that encompasses many dimensions including resilience, decision making, communication, empathetic evaluation etc.

Implications
- Future decisions in terms of long-term care are made on both rationality and pragmatic characteristics as well as compassionate and consensus building grounds.

• Compassionate care can reduce stress amongst dementia patients.

Signals
Paille, L., Croteau, A. & Applebaum, S. H. (2020, December 1). *Why women's leadership must be prioritised in the COVID-19 crisis.* Retrieved from https://theconversation.com/the-world-needs-more-women-leaders-during-covid-19-and-beyond-150599

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23. Online social community

The platform allows interaction between patients and community via digital tools that facilitate communication across all sectors of care. This helps in receiving and providing community care, support from varied sources through easy social media platforms.

Implications
• Connection to other people through any means provides better balance in health safety.
• Isolation can be effectively alleviated with practical, low-cost means of technological platforms.
• Residents can build back into the community through varied online means of communicative technology.
• Virtual care grows not only as a platform for physical care provision but also to attend the psychological and mental needs of patient during healthcare crisis.

Signals
"People with severe dementia are unaware of COVID-19 outbreak, indicates study." (2020, September 21). Retrieved from https://www.news-medical.net/news/20200921/People-with-severe-dementia-are-unaware-of-COVID-19-outbreak-indicates-study.aspx

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24. Employing caregivers from within local community

Caregivers who are competent in care-provision are employed from the local community instead of bringing in migrants workers to provide for patients of varied ethnic diversities.

Implications
- Job opportunities are created during economic crisis.
- Caregiver may or may not be able to adapt to cultural needs of patient of different ethnic diversity.
- Ethnically diverse residents may or may not be reciprocative to caregivers from local community.

Signals
Michel, S. (2019, April 3). *The Global Care Tilt: Migrant Caregivers Flock to Wealthy Countries to Meet Rising Demand.* Retrieved from https://www.newsecuritybeat.org/2019/04/global-care-tilt-migrant-caregivers-flock-wealthy-countries-meet-rising-demand/

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25. Participatory workshops during crisis

Workshops are held regularly involving caregivers, families of patients to build initiatives that address different health challenges. Participatory nature provides new way for user and relevant stakeholders by directly engaging with stakeholders to create swift action plans.

Implications
- Residents play an active role in the treatment and procedures they receive.
- Bringing different stakeholders of LTC homes for a participatory workshop can enable them to reflect on issues of concern, creating a soapbox.

Signals
Fleerackers, A. (2020, November 27). *Helping Loved Ones Stay Connected During Disconnected Times.* Retrieved from https://www.ecuad.ca/news/2020/helping-loved-ones-stay-connected-during-disconnected-times

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26. Self governance in LTC home

In times of crisis, self governance takes the forefront as long-term care homes are decided best to understand the needs of their patient. This pushes LTC homes to make their own policies towards similar care provision for each patient when they need personalized care.

Implications

- Pushing similar standardized treatment for every patient can lead to poor outcomes for patients who are in limited or no need of that particular treatment.
- Inaccurate decisions taken be self-governance system might keep their procedures unaccountable on varied levels.
- Evidence-based treatments are thrown into the forefront when we need personalized care for dementia treatment.

Signals
Leonard, D. (2012, October). *The Risks of Standardized Health Care.* Retrieved from https://www.npcnow.org/newsroom/commentary/risks-standardized-health-care#:~:text=By%20pushing%20a%20standardized%20treatment,benefit%20from%20that%20particular%20drug.&text=And%20it%20can%20be%20challenging,benefit%20from%20alternative%20treatment%20options.

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Stinson, L. (2020, August 18). *Our Average Life Expectancy Could Increase to 115 Years Very Soon.* Retrieved from https://pubmed.ncbi.nlm.nih.gov/19781667/

27. Neurotechnology

AI increases the ability of healthcare professionals to better understand day-today patterns and needs of the people they tend to by directly connecting to the nervous system. It is a growing trend to cure dementia.

Implications
- Dementia as a disease can be cured.
- Expensive medical technologies would be for selective treatment of dementia i.e., the wealthy.
- Neurotechnology puts consumers in complete control of their health and well-being.
- AI is integrated into providing healthcare for more than just dementia.

Signals
"No longer science fiction, AI and robotics are transforming healthcare". Retrieved from https://www.pwc.com/gx/en/industries/healthcare/publications/ai-robotics-new-health/transforming-healthcare.html#:~:text=It%20puts%20consumers%20in%20control,and%20support%20for%20staying%20healthy

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Mohan, J. (2019, October 4). *Neurotechnology | The Next Frontier.* Retrieved from https://medium.com/@jashimohan01/neurotechnology-the-next-frontier-af03f92803a

28. Multi-disciplinary expansion of government

Instead of bringing sudden increments in MOHLTC, gradual increments are proposed, reimagining the department as multi-disciplinary to provide for the varied needs of LTC homes during a crisis.

Implications
- Reimagining the department of long-term care can lead to increased division of power while also reaching robust, quick decisions.
- A multi-disciplinary team would be well informed on the workings across the LTC system and not knowledge-specific to a particular field of scope.

Signals

Crabtree, J., Kaplan, R. D., Muggah, R., Naidoo, K., O'Neil, S. K., Roth, K., Schneier, B., Walt, S. & Wrage, A. (2020, May 16). *The Future of the State.* Retrieved from https://foreignpolicy.com/2020/05/16/future-government-powers-coronavirus-pandemic/

Tierney, J. (2020, May 20). *The Politics of Fear.* Retrieved from https://www.city-journal.org/the-politics-of-fear

Ho, S. (2021, January 21). *Doctor says Canada underfunding long-term care amid call to end for-profit homes.* Retrieved from https://www.ctvnews.ca/health/coronavirus/doctor-says-canada-underfunding-long-term-care-amid-call-to-end-for-profit-homes-1.5276392

29. Increase in dementia patients

The number of dementia patients have doubled by 2035 in developing countries. This increase is due to growth in Canada's senior population which is predicted to rise 68% since 2020. The rate of increase is not necessarily uniform over the time period.

Implications
- The number of facilities that are required for dementia patients will need to increase or reimagined to accommodate for increasing numbers.
- Healthcare systems will have to bear extra economic burden of providing for the increase in patients every year.

Signals

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30. Virtual data an asset

The Canadian Longitudinal Study on Aging has collected data of dementia patients over the past decade to make better informed decisions on how to support them. The data collected includes demographics, programs conducted, mortality rates, policies implemented and so on.

Implications
- Policies and decisions made from collected data makes people feel more valued and supported.
- Data becomes a valuable but challenging to maintain and secure.
- Analyzing poor quality data may result in incorrect inferences.

Signals
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31. Delayed retirement age

Delaying retirement age provides lat retirement benefits that are invested in LTC when in need of assistance to growing needs.

Implications
- Independent way of life is established over longer period of time.
- Increased usage of technologies at home for easier way of living.

Signals
Heath, J. (2020, February 10). *Planning for the (potential) costs of long-term care.* Retrieved from https://www.moneysense.ca/columns/ask-a-planner/the-costs-of-long-term-care-and-how-to-insure-against-them/

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32. Adapting trans humanism

Transhuman being has the look of a human but with abilities beyond those of standard humans. With accelerating advancements into medical technology, the need to build onto the standard human intelligence has grown in order to fully utilize the potential of technological innovations.

Implications
• Aged population is not considered vulnerable anymore.
• A psychological divide is generated between human and above-human.
• Medical technology for dementia becomes more advanced and flexible to experiment with.

Signals
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33. Artificial Intelligence

Independent corporations dedicated to AI research have collaborated with Alzheimer's Society of Canada and produced tools that allow repeatable, remote, and cost-effective assessment for dementia. AI helps in analyzing the vast, unstructured medical data to give better insight into a patient's needs.

Implications

- Remote monitoring of a person's movement enhanced through AI provides them independence as well as security in LTC.
- AI technology cannot replace person-person care but enhances care and support for patient to stay at home longer before they need regular assisted services.

Signals

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34. Businesses reimagine products for seniors

The crisis of a pandemic though personifies danger, also creates opportunity for established brand businesses to reimagine their products that can benefit dementia patients towards learning, personal aid and communication.

Implications
- Long-established businesses manufactured products are easier and trustworthy for seniors to interact with owing to previous interactions with the brand.
- Partnerships are formed between businesses and care systems for producing material.

Signals
Am, J. B., Furstenthal, L., Jorge, F. & Roth, E. (2020, June 17). *Innovation in a crisis: Why it is more critical than ever.* Retrieved from https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/innovation-in-a-crisis-why-it-is-more-critical-than-ever

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35. Expedited immigration laws

Policies are changed to expedite immigration laws to bring in foreign immigrant workers when the senior population overtakes caregiver population developing a crunch in effective care provision that has a magnified effect during a pandemic.

Implications
• Higher influx of experienced caregivers to provide care for dementia patients.
• Policies changed for benefit of patients can encourage more people to be associated with LTC plans and initiatives.

Signals
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36. Self care

Seniors no longer require assistance or support from external resources and capable of handling the day to day activities of life on their own.

Implications
• Self care builds mental independence and stronger psychological health during a crisis.
• Better care can be taken through self care, building healthier lifestyles and social connections.

Signals
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37. Wealth tax

Government of Ontario passes wealth tax policy taxing the super rich for provision of care in LTC services by generating revenue that is distributed equally amongst patients who cannot afford professional care services.

Implications
• Inequality gap between the rich and poor reduces.
• The policy can raise revenue for sustained, long-term investment in LTC services.

Signals
Allentuck, A. (2020, November 12). *What a wealth tax could mean for financial planning.* Retrieved from https://www.theglobeandmail.com/investing/globe-advisor/advisor-news/article-what-a-wealth-tax-could-mean-for-financial-planning/

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38. Sustainable natural environment

LTC facilities replicate home environment settings, building a healthy, natural environment in a LTC facility which incorporates familiarity and ease of being at home for a dementia patient.

<u>Implications</u>
• There is higher impact on quality of life and functional ability for dementia patients.
• Specific research is conducted on design of physical environment appropriate to dementia needs.

<u>Signals</u>
Astles, B. L. (2015). *The impact of outdoor environments on health and well-being of residents in long-term care facilities.* Retrieved from http://summit.sfu.ca/system/files/iritems1/16054/etd9289_BAstles.pdf

Day, K., Carreon, D. & Stump, C. (2000, August 1). The Therapeutic Design of Environments for People With Dementia. Retrieved from https://academic.oup.com/gerontologist/article/40/4/397/641845

39. Seniors social environment

Seniors constitute onto a healthy social environment that can help examine and build environment-behaviours relationships in a community setting.

<u>Implications</u>
• There is higher impact on quality of life and functional ability for seniors.
• A chance at second life for seniors is obtained that shapes them back into useful members of the society.

<u>Signals</u>
Stinson, L. (2020, August 18). *Our Average Life Expectancy Could Increase to 115 Years Very Soon.* Retrieved from https://www.allure.com/story/the-future-of-aging

Morgan, D. G. & Stewart, N. J. (1997, December 1). *The importance of the Social Environment in dementia care.* Retrieved from https://journals.sagepub.com/doi/10.1177/019394599701900604