An Exploration of Strategies for an Uncertain Future for CNIB Given Aging with Vision Loss

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ABSTRACT

Given that more than 25% of the Canadian population will be over 65 by 2036, an increase in age-related disabilities may affect the quality of life of this senior population. One of these disabilities is age-related vision loss. This research project is a foresight informed strategic exploration into how Ontario organizations that offer vision loss support might adequately provide for this significant demographic in the future. Through systems thinking and foresight methodologies, this project investigates the current and future environment of the vision rehabilitation service landscape for seniors. Insights generated are used to develop a set of robust strategic actions that may help the Canadian National Institute for the Blind (CNIB), Canada's largest provider of vision loss support, to continue their mission in ensuring a quality of life for seniors with age-related vision loss through remaining resilient under uncertain futures.

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dedicado a **Lilián y Roberto**

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1. INTRODUCTION

This project started before even beginning my Graduate degree, trying to understand the blurred line between abilities and disabilities, what a prosthesis is, and what an enabler or an enhancer is.

Later on, as a newcomer in Canada, one of the ways I learned to integrate into society was through volunteering, and one of my first volunteer roles was as a sighted guide for the ASAM (Association des Sports pour Aveugles de Montréal). I learned many things from this volunteer experience and understood a little bit more about how difficult it is to adapt to a new situation of visual impairment.

On the journey of going into a more specific research question, this previous experience influenced my approach and took me to dig a little bit more around different issues on losing one's sight. Some of these issues are, for example:

> that every year more than 50,000 people will lose their sight in Canada (CNIB, n.d.-f)

> that UV radiation is associated with two of the main causes of vision loss (P. Blindness, 2018) and how vital are sunglasses to prevent this,
>
> or, that in the United States, electric cars are now required to make noise at low speeds, “to prevent these vehicles from injuring pedestrians, especially people who are blind or are visually impaired.”(Hawkins, 2016)

So, this past volunteer experience added to the multiple needs in the field of vision loss rehabilitation identified, made me incline this project towards the current and possible future opportunities for vision loss rehabilitation and support.

The approach to this problem has been made through the perspectives CNIB Foundation Ontario and CNIB Vision loss Rehabilitation Ontario as a case study for the final recommendations.

Hope you enjoy this research.

2. PURPOSE

This research project is a foresight informed strategic exploration for Canadian National Institute for the Blind (CNIB) and its main divisions in Ontario. The study of the current system, with its issues and opportunities, is complemented with a foresight approach to understand some of the possible changes that may affect the CNIB's capacity to provide adequate support for seniors with vision loss in Ontario in the future. Through this approach, this exploration aims to offer the CNIB Ontario a set of strategic actions that can complement their current strategies to remain resilient in the future. This set of strategic actions may be extrapolated to other chapters of CNIB considering that the CNIB Ontario chapter can be seen as a snapshot of how the organization works across Canada, and represents the largest operation in the country.

This research project analyzed the system of vision loss support in Ontario and identified the main issues of concern through interviews conducted with experts and representative stakeholders such as seniors with vision loss. The information gathered through these interviews along with the literature review and its analysis

helped to establish a base and determined the information to be researched regarding trends and signals, to feed the foresight process.

CNIB is the largest organization in Canada providing support for visually impaired people across Canada (Brown, 2016). The Ontario CNIB divisions (Vision Loss Rehabilitation Ontario and the Foundation Ontario) are also the most representative organizations supporting vision loss in the province and a valid example of how other CNIB chapters work in the other regions. Added to this, the openness of CNIB to share information and provide connections for interviews has been of high relevance for being able to consider them as the case study for this research project.

Although the primary focus of the research are the CNIB Ontario divisions, by setting up this general base layer of knowledge of the service system added to the future scenarios, other organizations supporting vision loss rehabilitation may equally benefit from using this research to complement their information, and create, test and optimize their strategic actions using the future scenarios developed.

3. RESEARCH QUESTION

How might organizations provide adequate support now and in the future for a growing and partially unserved population of seniors with age-related vision loss?

The research question emerged after realizing three different factors that are current issues today in Ontario and have no apparent prospects of being solved.

3.1. Growing senior population:

Based on the last census made in Canada, more than 15% of the Canadian population is over 65. Given current demographics, this may increase to more than 20% by 2024 and 25% by 2036. (Statistics Canada, 2015). With this more significant percentage of an older adult population also comes an increase in age-related disabilities that affect the quality of life of senior populations. Organizations supporting seniors with vision loss may need to be prepared to serve a larger quantity of clients that are currently partially served.

3.2. Age-related vision loss:

Vision loss as a condition covers a range of impairments and includes people who have a low visual impairment, to people who are blind. Vision loss can affect the person from birth or later in life. This visual impairment can affect the visual perception in different ways “In addition to low visual acuity and narrowed visual field, vision loss can also be characterized by other forms of impairment such as loss of depth perception or contrast sensitivity” (CNIB, n.d.-f).

“Most of the major eye diseases are age-related”(CNIB, n.d.-f; National Post, 2013), and approximately 50,000 people will lose their vision every year (CNIB, n.d.-f). As stated by the Ontario Association of Optometrists, more than 2 million Ontarians live with one of the four most common eye-diseases related with vision loss, and one of each three people older than 65 years old will have some visual impairment. This situation will double their risk of falling and will triple their risk of depression (Ontario Association of Optometrists, 2015).

3.3. Unserved population:

As showcased in the report from the Canadian Medical Association “The State of Seniors Health Care in Canada”(2016) apart from an increase in the senior population, there are other issues not yet solved related to an adequate delivery of healthcare services. One issue is that the current healthcare system was built “to deal largely with acute, episodic care for a relatively young population. Today our system struggles to properly care for patients — many of whom are elderly — managing complex and ongoing health issues.”(Canadian Medical Association, 2016). The second issue is related to high variability and disparity of care delivery across the country, and to different populations. Not every city and population has access to the same type of care; this may be because of infrastructure, technology, communications and collaboration issues, or disputes between levels of governments (Canadian Medical Association, 2016).

To solve this question, an understanding of the system of vision loss rehabilitation services and its current issues is followed by a foresight approach. The outcomes are then used to explore and develop strategic actions for CNIB Foundation Ontario and CNIB Vision loss Rehabilitation Ontario as a case study.

4. METHODOLOGY APPROACH AND METHODS USED

The overall methodology of this research project was developed with a design thinking approach with four phases: Phase 1 – Discovery; Phase 2 – Problem Framing; Phase 3 – Possible Solutions; and Phase 4 – Solution Selection. Systems thinking and foresight methods were used throughout the research process. The specific methods used under each phase of the research methodology are outlined below (in green):

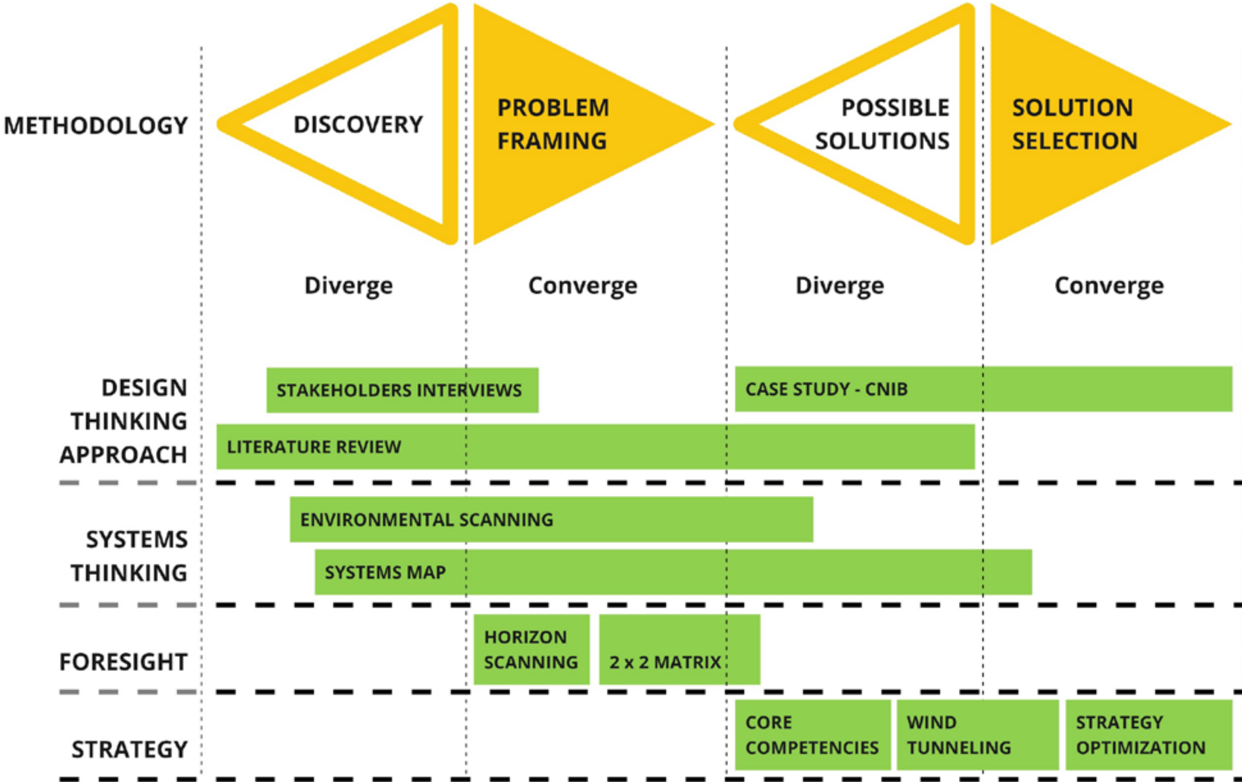

Figure 1| Research Methodology and Methods

Design thinking, starting by discovering and understanding the problem through a diverging process, then converging by framing the problem for later diverging into an exploration of possible solution alternatives for later converging into a proposed solution. Involving as many different stakeholders connected with the problem as possible, enabling an empathic approach to the proposed solutions.

Case study - CNIB: the case study helped to frame and focus the solution into a specific organization, in a way that can be actionable, of better help and an example of the benefits of using the current process through a particular stakeholder's perspective.

Systems thinking, by understanding most of the different influences and interactions between stakeholders and identify the leverage points that can trigger a change in a complex system. The following are the methods used:

Environmental Scan: a detailed study of the current system and context for senior care in Ontario and Canada.

Systems Map: visualization of the different actors in a system, their relationship, influences and power dynamics. This visualization helps to clarify how resources flow across the system and where main levers of change are situated.

Foresight, included in the design research process is the development of possible future scenarios and conditions as part of the creation of a future-proof strategic recommendation. The foresight methods used are the following:

Horizon Scan: analysis of emerging events and implications that may trigger changes in the future. This analysis includes trends and emerging issues.

Double uncertainty - 2 x 2 matrix: based on the two most uncertain and impactful trends, a double axis matrix is created where each axis shows the higher and lower values of each of these trends, creating a framework to develop four different future scenarios.

Strategy, a plan comprised of actions to achieve an overall objective. The methods used to establish the strategy are:

Core Competencies: Analysis involving future planning based on the availability of resources, develop key capabilities and transform them into core competencies (Braun, 2002).

Wind Tunnelling: Test and analysis of strategic options across different scenarios to validate their “robustness in more than one potential future” (Hodgson & Midgley, 2014).

Strategy Optimization: Refinement of the strategy with the analysis and inputs gathered from the wind tunnelling method.

4.1. Primary research

For this research project, semi-structured interviews were done with different stakeholders related to the topic. Experts, in the fields of organizations supporting seniors, training for orientation and mobility, ophthalmology, caregiving and advocacy gave the perspective of care provision and the systems that enable it. Representative stakeholders were also interviewed including seniors with vision loss and family members, whether supported by a vision loss rehabilitation organization or not, to give the perspective of care receivers.

Another source of primary research was the previous experience of the researcher while volunteering as a sighted guide in Montreal three years ago. This autoethnographic experience let the researcher discover some of the barriers visually impaired adults and seniors have to deal with and adapt to while living in a non-accessible city.

4.2. Secondary research

This research was also supported by literature review, gathered from published papers, organizations reports, interview videos, video blogs, among other sources. The topics that were researched looked to clarify who are seniors in Canada and what are the characteristics of this population; what does it mean to be visually impaired; who are supporting visually impaired seniors in Ontario; what services are available; how are these services funded, and which policies are supporting either seniors or organizations in Ontario. This research was of help to establish a first understanding of the overall systemic structure of vision loss in seniors and the relevancy of rehabilitation as a sub-system.

4.3. Study limitations

This research project aims to establish one more step toward possible future projects. The best efforts were included to develop a useful and thorough research project. However, some limitations must be acknowledged.

Time and resources: additional time could have facilitated conducting more interviews, especially with stakeholders in other cities and parts of the province that the secondary research shows are not being well served. It would have also facilitated the creation of recommendations focussed on a broader range of stakeholders, a more extensive area or other connected systems like support with guide-dogs or deaf-blind support services.

Research methods: with additional time and resources, more participatory research methods could have been applied, involving possible workshops with experts and representative stakeholders.

Co-design: additional time and the possibility to reach more stakeholders could have provided the opportunity to include them in a more in-depth co-design process through the project.

5. DISCOVERY: BACKGROUND AND CONTEXT

Vision loss rehabilitation service is a very complex discipline that integrates different stakeholders in different levels of influence and participation. The following information aims to give a general context of the different notions, concepts and stakeholders related to vision loss rehabilitation services with a focus on Ontario.

5.1. Vision loss

As previously stated, a vision loss condition covers a range of impairments which spans from people who have a partial vision, to people who are blind. Vision loss can affect a person from their birth or later in life and depends on the level of impairment before a person is considered legally blind. To be legally blind means a person has a visual acuity of 20/200 or worse with best-correction available and/or a reduced visual field of fewer than 20 degrees in the better eye (CNIB, n.d.-f).

5.2. Diseases and causes

Vision loss is the consequence of many diseases. In the next pages, examples of the effects of these diseases are presented. These represent just one level of the effects and are showcased with the intention of presenting a general understanding and introduction; they do not aim to be a medical approach to the diseases.

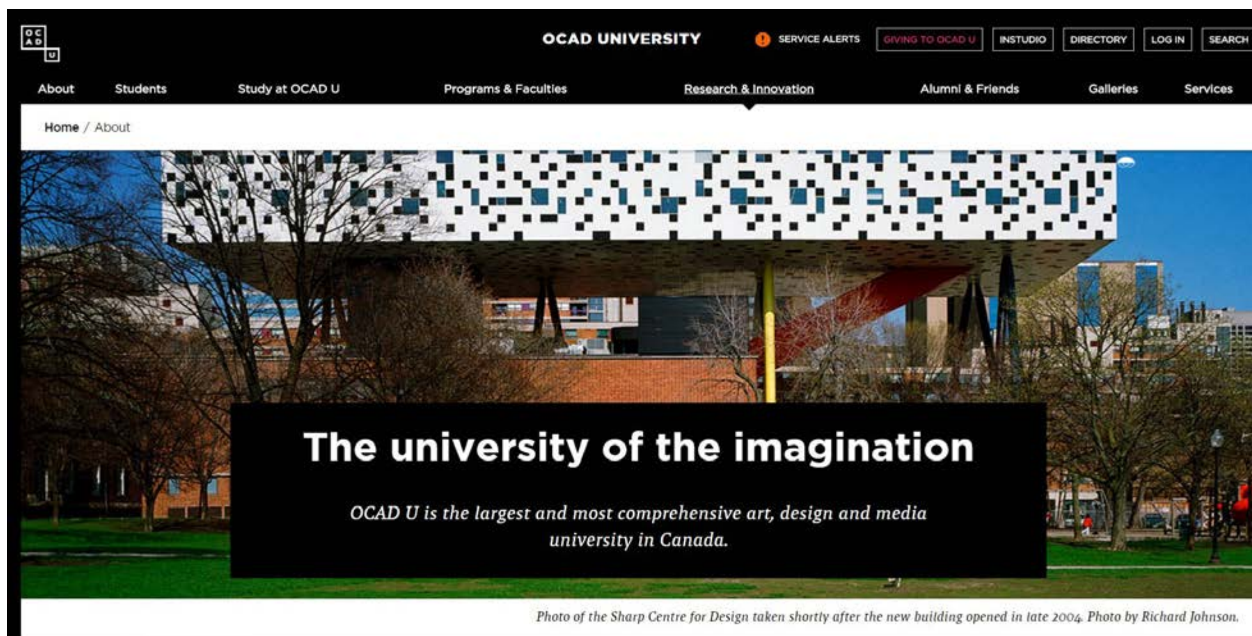

Figure 2 | OCAD home page represented as how people with normal vision would experience it (OCAD University, n.d.)

Figure 3 | OCAD home page represented as how people with age-related macular degeneration would experience it (adapted from OCAD University, n.d.)

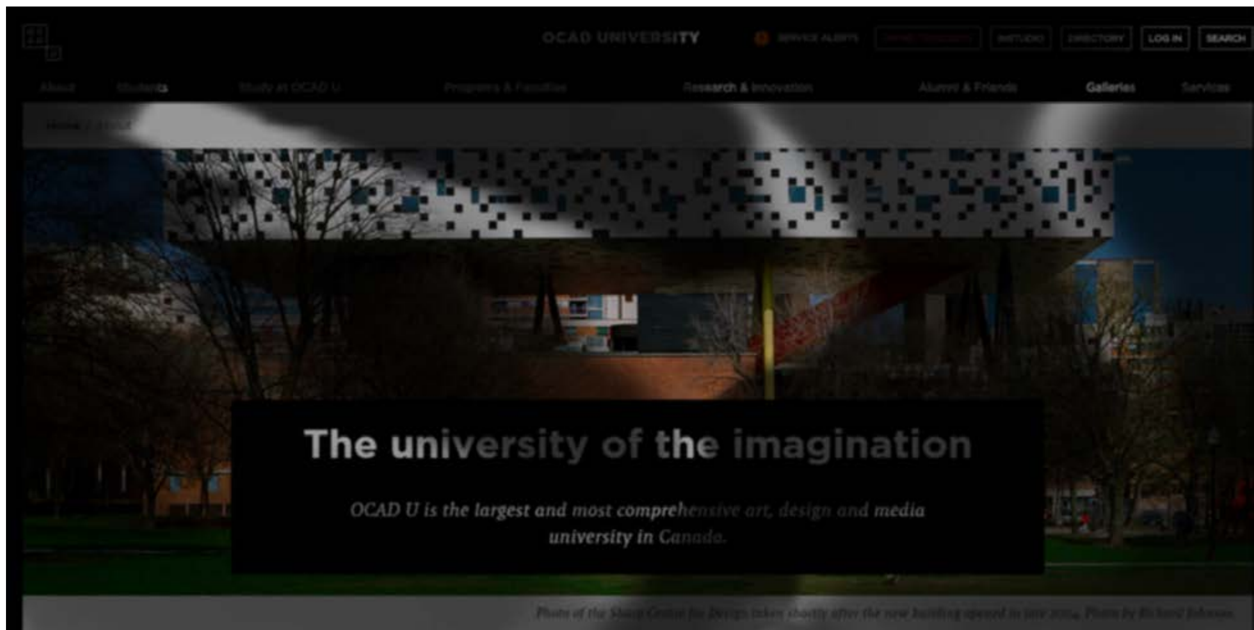

Figure 4 | OCAD home page represented as how people with diabetic retinopathy would experience it (adapted from, OCAD University, n.d.)

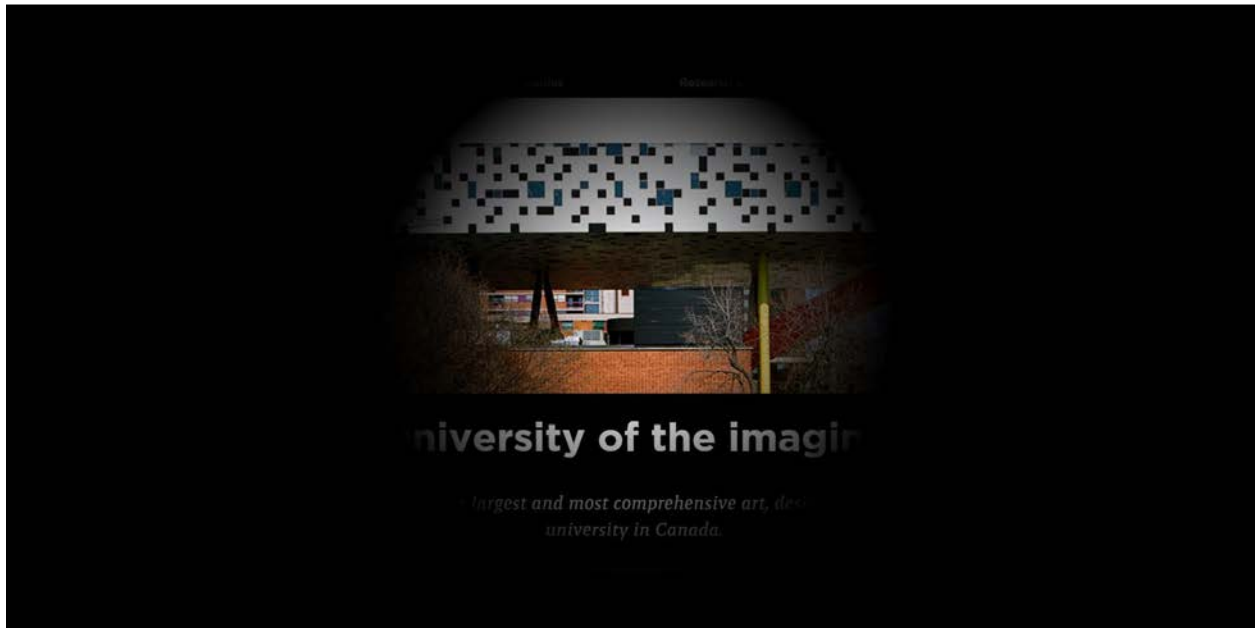

Figure 5 | OCAD home page represented as how people with glaucoma would experience it (adapted from, OCAD University, n.d.)

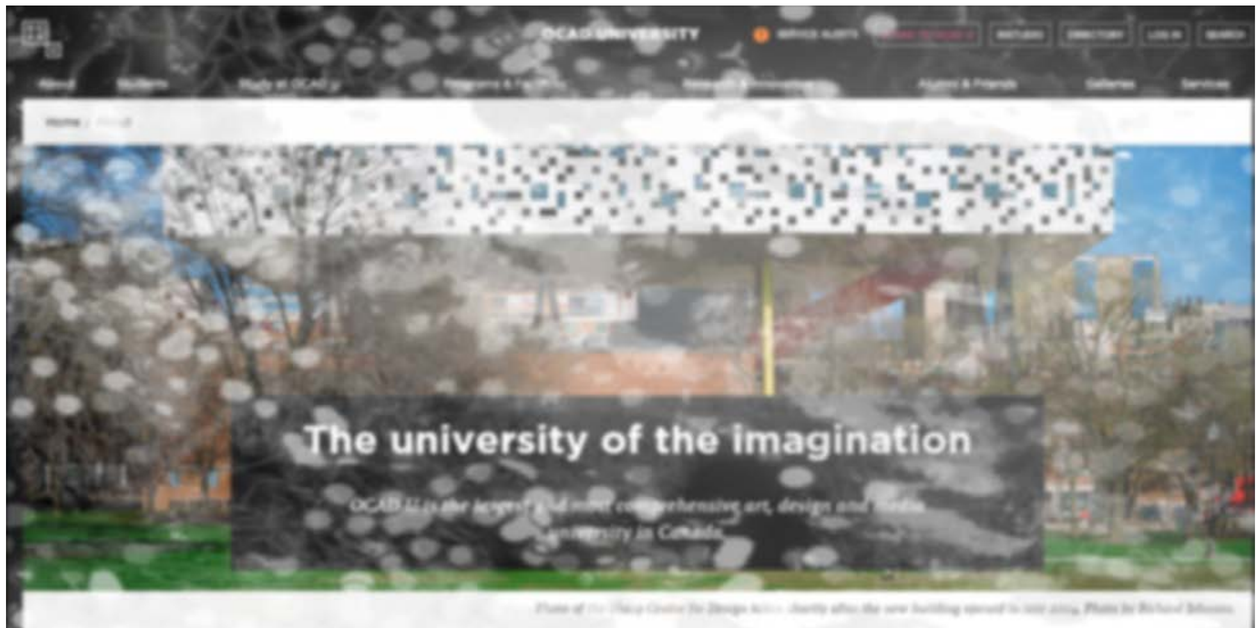

Figure 6 | OCAD home page represented as how people with cataracts would experience it (adapted from, OCAD University, n.d.)

Figure 7 | OCAD home page represented as how people with refractive errors would experience it (adapted from, OCAD University, n.d.)

The main eye-diseases related to vision loss in Canada are age-related macular degeneration, diabetic retinopathy, glaucoma, cataracts and refractive error (CNIB, n.d.-f).

The leading causes of vision loss, according to the World Health Organization are (WHO, 2017):

- uncorrected refractive errors, 53%
- un-operated cataract, 25%
- age-related macular degeneration, 4%

- glaucoma, 2%
- diabetic retinopathy 1%.

Moreover, the major causes of blindness are:

- un-operated cataract 35 %
- uncorrected refractive error 21 %
- glaucoma 8 %.

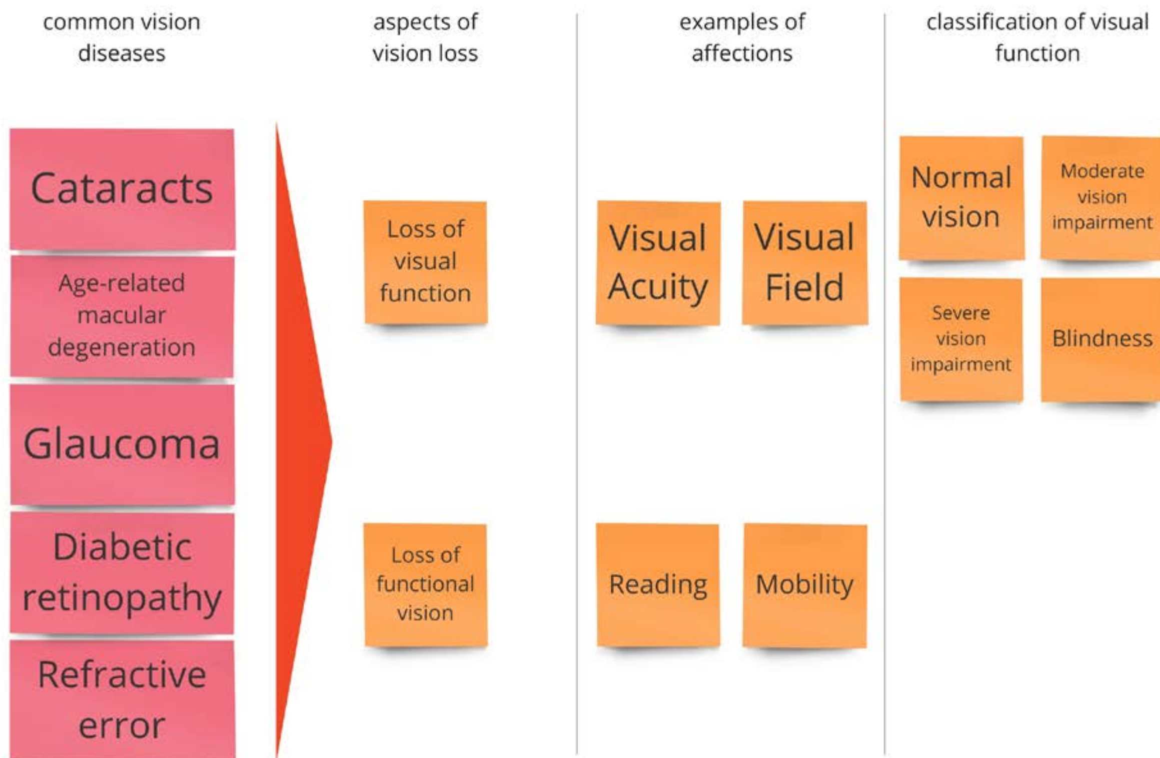

Figure 8 | Adaption of Aspects of Vision Loss (Colenbrander, 2003)

5.3. Current Prevention Strategies

More than 80% of visual loss impairments can be prevented if they are diagnosed and treated early enough (WHO, 2017). Because of this, prevention and early diagnosis have become an essential point to tackle the incidence and need for vision loss rehabilitation.

Current prevention strategies are focussed on:

Awareness: By diffusing information through websites, developing workshops, distributing flyers, and organizing talks in schools and senior care homes.

Screening & prevention: Initiatives of screening in schools and senior care homes are also part of prevention strategies. For populations with not enough access to eye-care support, other strategies are implemented like the Eye Van from CNIB in partnership with the Eye Physicians and Surgeons of Ontario. This initiative targets “30 communities in Northern Ontario, providing service to approximately 4,500 patients” (CNIB, n.d.-c) or the Mobile Eye Clinic (MEC) from the CCB which targets low-income senior population living in Ottawa Community Housing (Graham & Reategui, n.d.).

Other prevention strategies include educating the public about modifiable risk factors related to eye disease prevention like quitting smoking, improving diet, promoting UV ray protection or getting regular eye exams (CNIB, n.d.-i).

Strengthening community networks: All the previous activities plus advocacy and social activities support to build community networks where knowledge and prevention are much easier to improve and spread.

5.4. Clinical Eye and Vision Care Services

The Clinical Eye and Vision Care process is the overarching service system provided to the population. This process is comprised by the services of “examination and diagnosis, followed by development of a treatment plan, and then proceeds to management of vision impairment” (Markowitz, 2006, as cited in, National Academies of Sciences, Engineering, and Medicine, 2016).

The Vision Rehabilitation process is a multidisciplinary service where different professionals with different expertise support the visually impaired to re-adapt and regain the necessary skills to enhance their independence, safety and mobility. It is

a therapy that is customized according to the needs and goals of the client and is provided by certified specialists (Vision Loss Rehabilitation Ontario, 2017b).

In Ontario, the vision rehabilitation process is complemented with non-government funded services that for the purposes of this research we will call Social and Emotional needs support and Research Support.

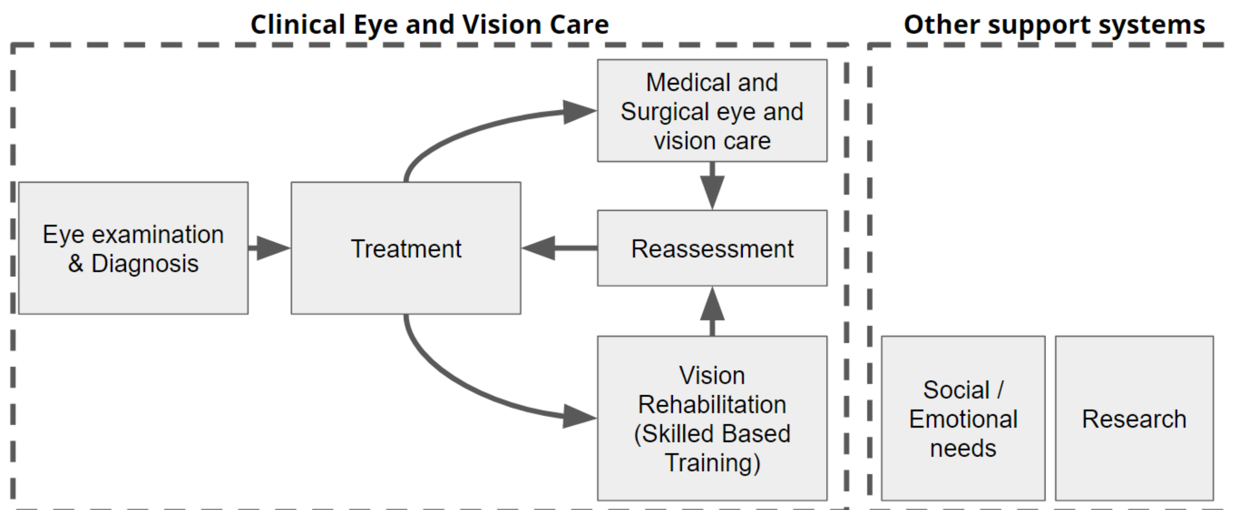

Figure 9 | Clinical Eye and Vision Care Services Process (adapted from, National Academies of Sciences, Engineering, and Medicine, 2016)

The following are the main key stakeholders involved in the system of Vision Care:

Eye-care subsystem:

Optometrists: As defined by the Canadian Association of Optometrists, the Optometrists or Doctors of Optometry are clinically trained and licensed to

deliver comprehensive primary eye care. This service goes from sight testing and correction to diagnosis of disorders and diseases within the human eye and visual system. It also includes fitting and dispensing eyewear, prescribing medication or providing referrals to secondary specialists, such as ophthalmologists, for treatment of systemic diseases or eye surgery when necessary (The Canadian Association of Optometrists, 2016).

Ophthalmologists: The eye care provided by the ophthalmologist includes primary, secondary and tertiary care. Patients usually require a referral from a family doctor or an optometrist to be delivered to an ophthalmologist. As defined by the Canadian Ophthalmological Society,

> “an ophthalmologist is a doctor of medicine who specializes in the diagnosis and treatment of disorders of the eye, in addition to diagnosing systemic disease that manifest in eye signs or symptoms. Since ophthalmologists perform operations on eyes, they are considered to be both surgical and medical specialists”. (The Canadian Ophthalmological Society, n.d.)

Ophthalmologists are also involved with preventative eye and vision care. The services from optometrist and ophthalmologists are only covered by the Ontario Health Insurance Plan (OHIP) if:

- People are younger than 20 years old or older than 65.
- The primary care provider (a family doctor or nurse practitioner) determines that the patient needs regular monitoring or has a medical condition or disease affecting their eyes.
- People have any of the following conditions: diabetes mellitus, glaucoma, cataract, retinal disease, amblyopia, visual field defects, corneal disease, strabismus, recurrent uveitis or optic pathway disease.

And one routine eye examination every two years is covered by the Ministry of Community and Social Services (MCSS) if the patient is under the Ontario Disability Support Program, Ontario Works, or the Family Benefits Program. (Ministry of Health and Long-Term Care, 2009)

Opticians: An optician dispenses eyeglasses, contact lenses or subnormal vision devices, based on the prescription of a doctor of optometry or physician, they can do this independently or as part of the eye care team. They do not assess, diagnose, or treat eye conditions, nor can they check or write prescriptions for eyeglasses or contact lenses (The Canadian

Association of Optometrists, 2016). The services of the optician are part of the eyeglasses dispensing services. This is not covered by the OHIP.

Vision rehabilitation subsystem - Skilled based training:

Low Vision Therapists: professionals that provide training to people who are partially sighted in "the efficient use of remaining vision with optical devices, non-optical devices, and assistive technology, and can help determine the need for environmental modifications in the home, workplace, or school" (Duffy, n.d.). Low vision therapists focus their work on tasks, activities and goals that the client wants to achieve and develop a tailored plan to help the client achieve these goals. The service offered by a low vision therapist is free as part of the vision loss rehabilitation therapy.

Vision Rehabilitation Therapists: professionals who instruct adaptive independent living skills to visually impaired people, enabling them to carry out a range of daily activities confidently. Vision Rehabilitation therapists work with the clients in their homes, at rehabilitation facilities or their

employment setting (VisionAware, n.d.-b). This service is free as part of the vision loss rehabilitation therapy.

Orientation and Mobility Specialists: professionals that train people with vision loss “to utilize their remaining senses to determine their position within their environment and to negotiate safe movement from one place to another” (ACVREP, 2018b). This training is focussed for indoor and outdoor travel, and includes the use of a white cane, electronic assistive devices like a GPS, using public transportation or support with a sighted guide or learning pre-cane skills (Duffy, n.d.). This training is offered for free in organizations supporting the visually impaired.

Assistive Technology Instructional Specialists: professionals who train people with vision loss and “empower them to achieve their life goals for education, employment, avocation and independence through the use of assistive technology” (ACVREP, 2018a). The service offered by these specialists is free.

Early Intervention Specialists: professionals who assess the needs of children ages birth through two, give a unique instruction and hands-on training to help the make sense of their world and provide "supports designed to help families care for and encourage the development of their infants and toddlers" (Willings, 2017)

Social and emotional needs support

Volunteers: the main stakeholders involved in this area are volunteers who can be sighted or visually impaired. They give support through the organization of social activities, conducting advocacy initiatives or offering peer-support. These activities help visually impaired people to fulfill their social and emotional needs and enhancing their quality of life.

5.5. Governmental fund supporting vision loss rehabilitation programs in Ontario

Organizations supporting vision loss rehabilitation offer their therapy services for free. For this to happen, they are funded by the provincial government, in full (for example CNIB-Vision Loss Rehabilitation Ontario) or partially relying on other

sources of income like donations, fundraising or special grants (for example Balance for Blind Adults, CNIB-Foundation). The Government of Ontario offers support through three ministers:

Ministry of Community and Social Services (MCSS): Through the Ontario Disability Support Program, provides financial support for people with disabilities up until 65 years of age (Ministry of Community and Social Services, 2018). The MCSS also provides funding to support the intervention services offered by deaf-blind community services (Ministry of Community and Social Services, 2010b).

The Ministry of Health and Long-Term Care: The Ministry of Health and Long-Term Care funds the Local Health Integration Network Ontario (LHIN), which funds among others Vision Loss Rehabilitation Ontario and Balance for Blind Adults, both supporting seniors with vision loss. Also, as part of the Ministry of Health and Long-Term Care, the Assistive Devices Program (ADP) offers support to people with long-term physical disabilities for the acquisition of customized equipment, or specialized supplies. This program covers 75% of equipment and supplies (Government of Ontario, 2018). These subsidies are only available for certain devices depending on specific eligibility criteria.

The Ministry of Child and Youth Services: This ministry funds blind low vision programs focussed on Early Intervention services for children, birth to school aged, and their families.

5.6. Organizations supporting seniors with vision loss

The organizations that offer support for vision loss rehabilitation can be divided into three; the first group do mainly activities of advocacy and social integration **(ASI)**, a second group offers specific skills training **(SKT)**, for example, mobility and orientation or living skills, and a third group supports research related to vision loss **(RS)**.

Some organizations cover more than one aspect. In Ontario, the following groups provide a range of services:

CNIB (Canadian National Institute for the Blind): is a Canadian organization offering support for visually impaired people all across Canada. In Ontario, the organization is divided into three separate divisions.

1. **Foundation Programs and Services (ASI):** provides programs and services that address the social and emotional needs of people dealing with sight loss, building their confidence and self-advocacy skills.

2. **Vision Loss Rehabilitation Ontario (SKT)**: is the leading provider of rehabilitation therapy for people who are blind or partially sighted.

3. **Deafblind services (SKT)**: provides programming empowering people who are Deafblind to live as independently as possible in their environment and the community (CNIB, n.d.-a).

Canadian Council of the Blind - CCB (ASI): is a national membership-based not-for-profit charity organization that brings together visually impaired or deaf-blind Canadians through their local chapters to improve the individual and community quality of life of people who are blind (Canadian Council of the Blind, 2015).

Balance for blind adults (ASI - SKT): is a non-for profit organization providing services in Toronto. They provide specific services for people with vision loss like training, community resources (gym, health clinic) and social support through social

and craft clubs. The organization also offers training on awareness and sensitivity for other organization and companies who engage with visually impaired people (Adults, n.d.-b).

Foundation Fighting Blindness (RS): is a non-profit organization that funds and supports research related to how vision loss occurs, how it can be slowed or stopped, and how sight can be restored (T. F. F. Blindness, 2018).

5.7. Senior population and seniors with vision loss

Senior Population: Although there is not a specific definition of when a person becomes a senior in Ontario, for the purposes of this research, we will use a Canadian definition and consider a senior a person who is at least 60 years old and is retired or partially retired (Service Canada, 2015) (Line, 2018).

According to the article “Common Causes of Vision Loss in Elderly Patients,” one-third of the senior population “has some form of vision-reducing eye disease by the age of 65” (Quillen, 1999) The main diseases causing vision loss are cataracts, age-related macular degeneration, glaucoma, and diabetic retinopathy.

With the increment of the percentage of seniors as part of the Canadian population, age-related vision loss becomes a bigger problem which requires immediate attention as future senior populations continue to grow.

Living situations of seniors are diverse, and their characteristics have a consequence regarding how vision loss may be prevented, diagnosed or treated. Seniors may be living alone or may be living in a seniors care home, depending on the facilities they may need. Seniors may also be living with a partner or with a family. The type of care and support received by their relatives will influence directly how fast and easy the process of rehabilitation with vision loss will be.

6. DISCOVERY: ENVIRONMENTAL SCAN

The following section provides current contextual perspective on the problem, including how the different elements of the system interact.

6.1. Understanding the current needs and issues found in the system

The following needs and issues identified in the system are not part of one specific sector, most of them are part of different areas of influence. The following information is organized in different sections, but as this is not their only area of influence, they may well pertain to other sections.

The diagram on the following page serves as a general view of these intersections and influences.

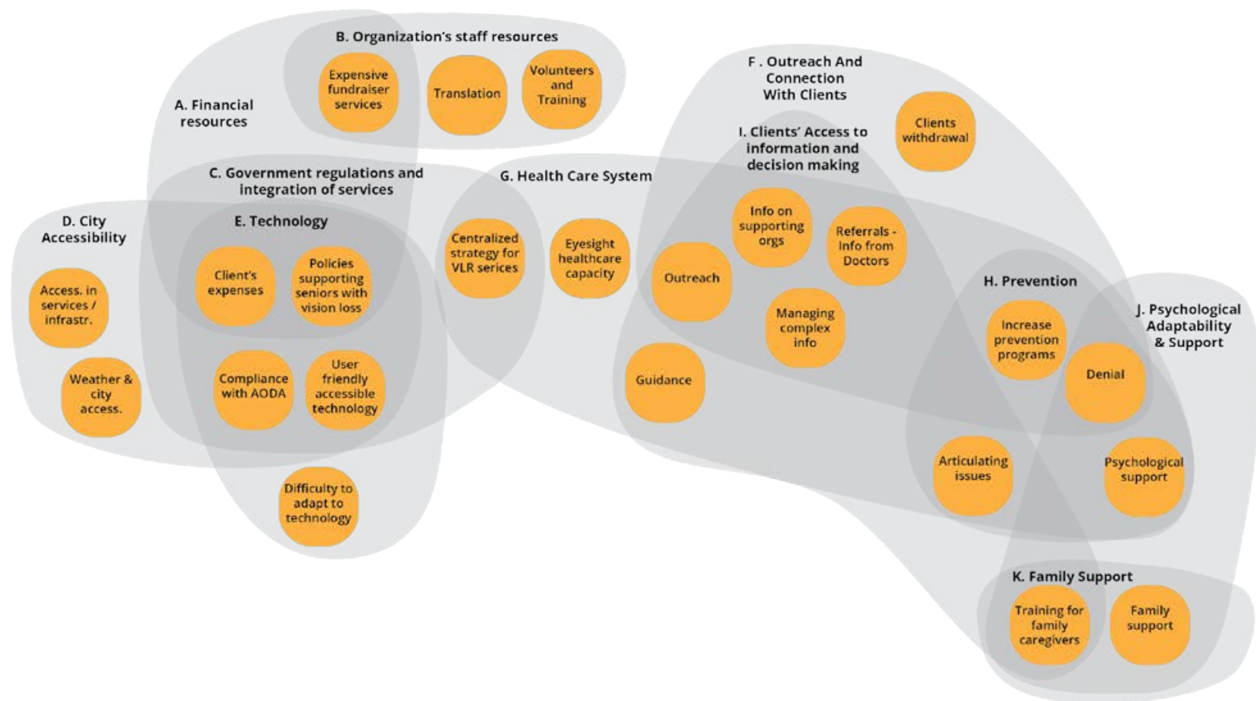

Figure 10 | Issues and Areas of Influence

A. Financial resources

Expensive fundraiser services: CNIB is a national charity that relies on revenues and fundraising. On the national level fundraising costs were 43% for 2016 and for each dollar donated, 54 cents go to the cause. (Charity Intelligence Canada, n.d.-b)

In Ontario, CNIB is composed of three different organizations, CNIB Foundation, Vision Loss Rehabilitation and DeafBlind Services. CNIB Foundation is entirely dependent on charitable funding, so the money raised today by CNIB goes to the CNIB Foundation services (CNIB, n.d.-a). Vision Loss Rehabilitation Ontario is fully

funded by the Local Health Integration Network Ontario (LHIN) (Vision Loss Rehabilitation Ontario, 2017a), as is true with other VLR from other provinces. CNIB DeafBlind Services is funded by the province of Ontario through the Ministry of Community and Social Services.

Balance for Blind Adults also receives funding from the LHIN but not for all of their costs, so they rely on donors to fund operational costs (Adults, n.d.-a).

Organizations like CCB rely on fundraising activities, done primarily by external fundraisers. Information from Charity intelligence Canada informs that CCB "reported external fundraising costs of $1.1m. External fundraisers raised $1.9m on behalf of the charity, producing an external fundraising cost ratio of 60%." This is the primary source of revenues for the organization. (Charity Intelligence Canada, n.d.-a)

There is a high cost of fundraising for an organization without secure funding. Added to this, the reliance on fundraising does not let the organization know how much funds it will receive every year. This situation affects their ability to make plans for the medium and long-term, including alliances or partnerships which can

help the organizations to expand services to low populated regions, where services are usually delivered partially or are not available at all.

Client's expenses: The economic situation of seniors when facing vision loss may be very diverse. However, vision loss is not a situation that many seniors are saving for. Services of rehabilitation for vision loss offered by the previously noted organizations are free of charge for clients with vision loss. Transportation around the city can be made through the wheel-trans system, a door-to-door service provided by the Toronto Transit Commission (TTC) for people with disabilities at the same rate as regular TTC fares. But there are other expenses that many seniors have not considered and may have to face after suffering from vision loss.

Seniors care home expenses: Costs for seniors care homes vary depending on the services included such as having access to meals and housekeeping to long-term 24-hour nursing care. This costs on average $2,815 a month in Ontario, but the variation is very high depending on the services ordered (Comfort Life, 2017a). Concerning caregiving support, the average cost in Ontario for caregiving services is between $20 to $30 per hour (Comfort Life, 2017b).

Family Caregiving: In the case of having a family member caregiving for the senior with vision loss either part time or full time, there is also a cost that is absorbed and varies depending on the situation. Although there are some tax benefits for this situation, these benefits are not enough as the Canadian Medical Association states it:

> “Unfortunately, social policy does not do enough to support people who provide unpaid care for seniors. Employment flexibility is limited, and tax credits for unpaid caregivers are insufficient to cover costs; unpaid caregivers can also burn out because of a lack of resources and supports. To be successful, the national seniors’ strategy will need to plan for the needs of these valuable members of the care team” (Canadian Medical Association, 2015).

Daily slowdowns: Time is a not a so obvious cost for seniors with vision loss, where the possibility of doing a certain amount of activities in one day is diminished by the different barriers and the challenges they face continuously.

Seniors 65 and older rely on their pension plan and are not currently part of the workforce. People with a prolonged and severe disability can be eligible for the Ontario Disability Support Program (ODSP) (Ministry of Community

and Social Services, 2010a). All interviewees agreed that visual impairment does affect their economic situation. How much it may impact will depend on many variables, like the level of vision loss, how early they may access to rehabilitation to adapt to this new situation, how sudden this change happens, the support they receive from family, friends or the community, their living conditions, etc. In general, vision loss in seniors means the person needs more time to do things; this could be because of the lack of proper accessibility of a space, product or service or/and because of other added age-related health issues. This factor can lead to having to hire external services for specific tasks, for example, housekeeping or tax claim forms filling.

Assistive devices: Assistive devices can be subsidized up to 75% by the Assistive Devices Program from the Ontario Ministry of Health and Long-Term Care. However, not all assistive devices are considered for subsidies. For example, the current installation of iBeacons for visually impaired people — which is a technology that "provides directions to help them navigate through doors and vestibules, to service counters, washrooms, and other important parts of buildings such as stores and restaurants" (Chung, 2017) —

requires an iPhone to be used, but the Assistive Device Program does not subsidize these, and it is not an open standard easily implemented on any other smartphone operating system. Like these, not necessarily all assistive technology can be included in the assistive device programs (Government of Ontario, n.d.-b). Technology can be beneficial to make services or activities accessible for seniors with vision loss, but it is also expensive, and the high investment in technology that may change at a fast pace becomes very risky if it needs a paid update or replacement after a short period.

Both of the previous issues collide into one question which is: should there be a subsidy for technology for visually impaired seniors and if so, who is going to pay for it?. As noted by The Economist related to technology targeted for all seniors - not necessarily with a disability:

> “Most of the technology needed to do all this already exists, at least in prototype form. The hard part is getting providers to pay for it. In the Netherlands five insurers now reimburse users for Sensara’s sensors and the company is in talks with others, including the health ministry. Other insurers are experimenting with reimbursements on wearables. But on the whole providers are still reluctant to pay for a gizmo today that might prevent a hip fracture and hospitalisation tomorrow.” (The Economist, 2017)

Guide dog benefits: The used of Guide Dogs by visually impaired people is supported by the government with $82 monthly until the person reaches 65 years old. After that, the subsidies cease, and seniors may have to let their guide dogs go. CNIB is currently researching the possibility of offering a program to subsidize the rest of period after the person loses the governmental support (CNIB, 2018).

B. Support Organizations' Staff Resources

Volunteers and Training: because these are charitable organizations, they rely on volunteers as an essential resource to deliver their services. Information gathered from sources of CNIB stated the following:

> "Because volunteers choose to partner with us, we are able to serve larger numbers of people...Many of the CNIB's Foundation programs are only able to be delivered with community partners, volunteers" (CNIB, 2017b).

> "Not only do volunteers support in carrying out programs in services, they help the organization build and maintain grounded connections with the communities and clients we serve"(CNIB, 2017a).

> “CNIB relies a lot on volunteers, and volunteers are very important for us, and what volunteers do can range quite a bit. A lot of the people volunteer at the store at CNIB; they help show products to different people, a lot of volunteers help with things like filing, putting away files, even now in the paperless society, we still get a lot of paperwork.” (Matthew Li, Orientation and mobility trainer, 2018)

One ambassador from CNIB also mentioned:

> “We are a member of an organization that depends on volunteers. Volunteerism has dropped dramatically, and it is going to drop even more so because a lot of our baby boomers have macular degeneration ... so volunteers are a big big thing, that is lacking within our organization, and many others” (Sharon Johnston, CNIB ambassador and visually impaired senior).

So, there is a need to outreach to more volunteers to expand the possibilities of organizations supporting seniors. CNIB is not the only one in need of outreaching to volunteers; Balance for Blind Adults is currently looking for five volunteer position to fill vacant positions on their board of directors (BALANCE for Blind Adults, n.d.).

Another issue worth noting is the need for training for volunteers. Two of the interviewees showcased the need for proper training for volunteers, and one mentioned that one of the possible reasons volunteers withdraw might be that they are being assigned positions not according to their desires. Some training is being

offered, but it may not be enough as stated by the interviewees. Complementing this information, the summary report Recognizing Volunteering in 2017 from IPSOS states:

> “BARRIERS AND ENCOURAGEMENT: Canadians cite a lack of physical or social opportunities (e.g. a lack of time and resources or family and friends not volunteering) as the main barrier to increased volunteering. 26% of Canadians cite the lack of physical or psychological capability (such as a lack of skills or knowledge of a worthwhile cause)” (2017).

Translators: Translators are another resource that is usually missing; In Ontario, 326,935 people, representing 2.5% of the population speak neither English or French. More than two-thirds of this group resides in Toronto (258,930 people, 4.4% of Toronto population) (Statistics Canada, 2017). If there are no family supports this represents a big concern for organizations to deal with. This issue was also showcased in the “Potential for patient-physician language discordance in Ontario.”

> “As immigration continues to increase, we may find that the linguistic needs of Ontario’s immigrant population diverge from the linguistic capabilities of Ontario’s primary care physicians. Further research on the language discordance in Ontario is needed in order to reduce the risk of language discordant clinical encounters and the negative health outcomes associated with these encounters.” (Sears, Khan, Ardern, & Tamim, 2013).

It is also important to add as mentioned by Jennifer Sears “If they don’t speak the same language, some patients may have to undergo unnecessary diagnostic tests trying to figure out the problem. It may also lead to longer hospital stays. It is going to put a strain on the health-care system.” This statement is highly related to another issue discussed in section I; Access to information and decision making (as cited in Keung, 2014).

C. Government regulations and integration of services

Lack of enough policies supporting seniors with vision loss: Interviewees identified that there are not enough policies around future strategies supporting seniors and seniors with vision loss. When researching the subject, the Canadian Medical Association stated in their report from 2015 “A Policy Framework to Guide a National Seniors Strategy for Canada”:

“This country must act now to create a health strategy that will ensure for our seniors the effective, integrated healthcare and supportive community care they need to enjoy the best quality of life possible” (Canadian Medical Association, 2015).

However, looking at the “Action for Seniors report” from 2014 from the government of Canada, we can see that many initiatives are being taken, including initiatives for seniors with disabilities. (Government of Canada, 2017)

As mentioned before under the Financial Resources (A.) section, one apparent issue is the lack of programs that can support visually impaired seniors to acquire specific technology or assistive devices. This issue is also a policy related issue, but in the background, the question may be how quickly the government can respond with strategies to adapt to changes in needs to support visually impaired seniors.

The perspective and experience of seniors with vision loss are not being taken into account for the regulation of new technology and its implementation. One example is the lack of regulation on electric vehicles which don't make any perceivable noise during their journey, and become a danger for people with visual impairment, who rely on hearing them to navigate safely (Hawkins, 2016).

Lack of an overall centralized strategy for an integrated vision loss rehabilitation service: As we saw in the section about vision loss rehabilitation, the characteristic of being a multidisciplinary service with many different

stakeholders contributes to making it a complex service where players do not have the same priorities and are not working together towards a common goal. The system lacks an overall strategy that can integrate the efforts of many organizations and professionals in the system in a coordinated way, preventing misuse of energy facilitating accessibility to the service for a larger population.

D. City Accessibility

Compliance with AODA: In 2005 the Accessibility for Ontarians with Disabilities Act (AODA) legislation became official, and since then many efforts have been put into place to comply with the act, making the city, organizations and business more accessible for people with disabilities, including seniors with vision loss. However, as identified by the Economic Development Minister Brad Duguid in 2005, 65 % of businesses still have not filed their 2012 accessibility reports, and 60 % have failed to meet the 2014 deadline (Monsebraaten, 2015). Updated information indicates that from 56,000 organization in the private and not-for-profit sector, only around 42% submitted a report and 94% from those informed that they were in full compliance. From the designated public-sector organizations, 86% have submitted their report compliance. Although this information shows that more organizations

are getting aligned with the accessibility requirements, there is still a long way to go (Accessibility Directorate of Ontario, 2018).

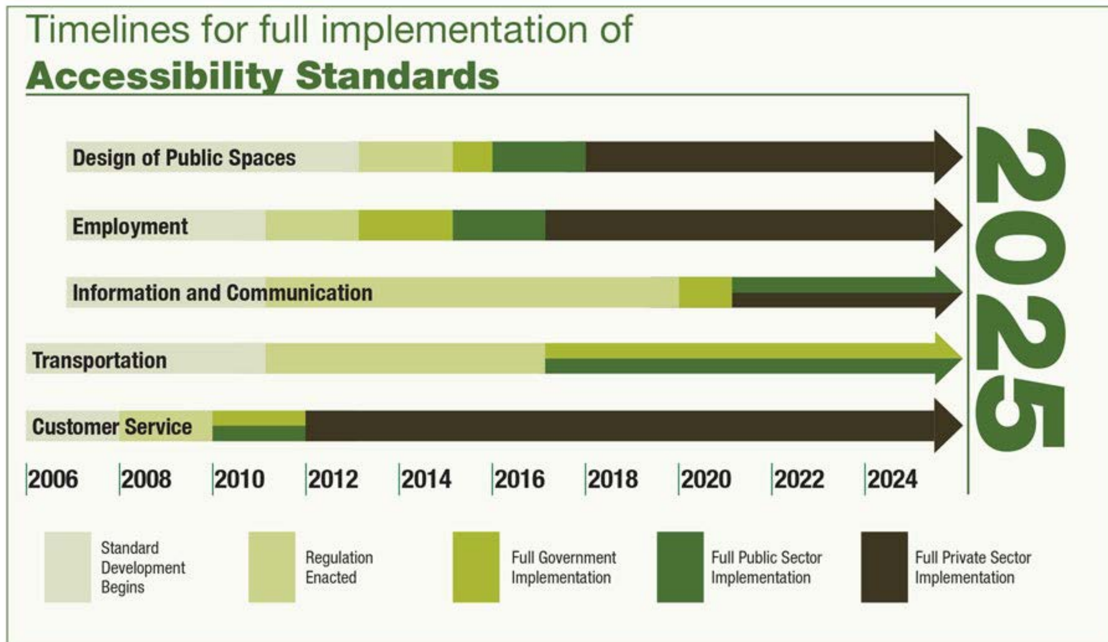

Figure 11 | Timelines for Full Implementation of Accessibility Standards (Government of Ontario, n.d.-a)

Accessibility in public and commercial services/infrastructure: Along with the AODA act, seniors with vision loss are currently struggling with the lack of accessibility of cities, their urban infrastructure and commercial and public spaces and services. Although not an exhaustive list, some examples that came up in the interviews and research are the following:

- Lack of adequate signage and maze-type circulation at locations with ongoing renovations, (i.e. Union Station).
- Lack of proper announcement of buses at bus stops.
- Continued rearrangement of product location in grocery stores.
- Lack of sound signals in elevators

Weather conditions affecting city accessibility: added to this previous characteristic, weather conditions like heavy snow or rain affect substantially the elements that visually impaired people use to mobilize themselves around the city. Heavy snow and ice can cover differences in height, textures or slopes that are used and sensed through a white cane to mobilize safely.

E. Technology

User-friendly and accessible technology: Not all technology and assistive devices are designed to be easy to use, especially for visually impaired seniors. One of the interviewees stated that for her to use the screen reader, she had to memorize too many functions, something not possible for her:

> “I have to memorize so many functions in order to make it operate. For instance, you have to know what the function is to read one word, you need to know what the function is to read a sentence. If you want to go back to the beginning of that sentence, you have to know another function, and once you get to a certain age and all of the sudden you have to learn all these functions, it’s too many. I’m waiting for a better update for seniors.” (Sharon Johnston, CNIB ambassador and visually impaired senior)

Megan McHugh, an instructor at the Canadian Helen Keller Centre for people with vision loss states "Assistive technology programs, features and work-arounds can go a long way, but sometimes they just aren't enough," (Buck, 2017).

Proper accessibility for visually impaired people is still also an issue with many websites too.

> “Some can’t be navigated solely with a keyboard. Often, multiple different elements on a webpage – like questions on a form, for instance – are all labelled, in the page’s alt text, as the same thing. That's confusing for someone with vision issues who is using a screen reader. Sometimes alt-text labels, like the ones that describe images on a page, are missing entirely” (Buck, 2017).

Difficulty to adapt to technology: Added to the previous issue, some seniors are having difficulties today to adapt to new technology that they have not previously used before. This issue may be generational, considering the jump from analog

devices to digital ones, and from key-entry information to touch screens. As noted by zmescience.com:

> "Before the advent of touch screens and the kind of more intuitively designed technology that we see today, many adults who weren't regular users of computers were frightened of irreparably damaging an expensive PC by deleting a critical file (even if that was never very likely). Turning a desktop on was puzzling, the navigational controls were alien and typing was frequently a single key at a time affair." (2013)

The approach to technology for those having a visual impairment can accentuate this issue even more.

F. Outreach and Connection with Clients

Clients withdrawal: One of the organization stated that as impairment increases, the possibilities of withdrawal of clients are higher. As activities become more complicated to deal with, and more rehabilitation is needed, the client will be less inclined to return to the organization and continue with new training.

As stated in the article "Eye Disease and Mental Health" from Unite for sight:

> “Eye disease increases the likelihood of social withdrawal, isolation, falls, and medication errors.” (Unite for Sight, 2015)

Organizations stress the importance of a continuous follow up on clients preventing withdrawals.

Outreach: Another issue that emerged during the interviews is outreach to seniors for education, awareness and to get to contact seniors with any level of vision loss. The source of these issues can be diverse. For example, the ability to access CNIB Vision loss Rehabilitation services depends on having a doctor's referral. However, as mentioned before, not all the doctors are currently directing patients to rehabilitation and giving referrals. The lack of information about the existence of supporting organization for vision loss rehabilitation also plays a significant role. The lack of integration between the different services available for vision loss rehabilitation may contribute to this issue.

Denial: During the interviews, other issues that may be connected with the difficulty of outreach to clients emerged. Client’s denial of having a vision loss issue

is not uncommon, as mentioned in Visionaware website (from the American Foundation for the Blind):

> “Some professionals have compared initial reactions to vision loss to the "stages of grief," defined by Dr. Elisabeth Kubler-Ross, after the loss of a loved one—taking the person from denial to anger and depression, and finally, to acceptance.” (VisionAware, n.d.-a)

Moreover, the Alliance for Equality of Blind Canadians:

> “Knighton, in Cockeyed (2006), like most individuals that are newly blind or those that have a vision impairment, is showing some signs of denial to his vision loss” (Tedrick, 2006).

The symptoms of having a vision loss issue may not be evident, and in seniors, they can pass as part of ageing. As mentioned in one of the interviews:

> “people still bump into things but they can still read a page and they don't really know why, but because they don't feel any pain they don't feel the need to see a doctor” (Matthew Li, Orientation and mobility trainer, 2018).

The importance of having a periodical diagnosis for treating or starting rehabilitation as soon as possible was raised.

G. Healthcare System

Eyesight healthcare capacity: One of the complaints raised during the interviews was the lack of resources to offer a fluent service.

> “I went to the eye clinic; I was shocked to realize how many ... waiting to get to talk the eye specialist, ... more than a hundred people waiting to talk to somebody” (Visually impaired senior, personal communication, February 18, 2018).

Although this is a known issue affecting not only eye-care but the whole healthcare system it is worth noting. As expressed by the Health Professions Regulatory Advisory Council (HPRAC):

> “Key informants in the Environmental Scan identified critical gaps: ‘the lack of unity among vision professionals on how best to address the crisis in vision loss’ and the lack of understanding among policy makers: ‘We have a lack of vision in vision care:’ Indeed, one of the more concerning results of the scan is this lack of understanding among policy and program developers regarding the importance and value of maintaining good eye health. While vision itself is valued, and while vision health services are seen as important, these attitudes do not translate into action for improved vision healthcare. In many respects, vision health is the poor relation in a family of more aggressive relatives, all fighting for attention and a piece of the health-care pie“ (Health Professions Regulatory Advisory Council, 2010).

Guidance: The inherent complexity of the healthcare system is apparently transmitted to the way the services are provided. The doctor appointment’s short duration, the lack of sharing enough information with the patients, and the referrals to so many healthcare specialists are some of the issues expressed by the interviewees. Support in navigating the system and managing the information is needed by the patients to make decisions better and focus their energy on what is relevant to them.

H. Prevention

Increase prevention programs: There is still needing to do more advocacy on prevention; not all the population is aware of the issues and diseases that could come for not taking care of eyes or treating in a timely way any disease. Adults aged

65 years or older should have an eye examination at least once a year (The Canadian Association of Optometrists, 2015). However, the research identifies that there is a population of seniors not accessing a timely diagnosis. This could be caused because of lack of accessibility to eye care professionals or personal reasons.

> "When we went into the seniors' homes, we found 60%-70% of the people examined had further vision issues that were undetected, and the good part it is that it could be corrected of the ones we examined, by getting optometrist or anybody to do it but, they don't" (Organization's expert, personal communication, February 6, 2018).

Information from the interviews informed us the seniors home care don't have as a standard to do an eye examination for new clients at the time they arrive. The information gathered about diagnosing seniors in care homes came from initiatives from supporting organization for vision loss. When the data from the Health Professions Regulatory Advisory Council (HPRAC) is reviewed, it states:

> "Generally, patients receive only those services of ophthalmologists or optometrists that are covered by OHIP and, since those services are usually off-site, they are difficult to access. The cost of eyewear is also untenable for some long-term care residents. Stakeholders said that mobile provision of eye care services and more visits to homes by eye care professionals would

improve patient care and safety" (Health Professions Regulatory Advisory Council, 2010).

I. Clients' Access to information and decision making

The inherent characteristics of vision and vision loss added to the inherent complexity of the healthcare system make the process of decision making a burden for seniors with vision loss, family members and medical staff.

Articulating issues: Information gathered from the interviews showcased that it is not always easy to articulate what a person with vision loss is experiencing. This makes more difficult the diagnosis and the possible treatment or referral to specialized rehabilitation. One of the family members of a senior with vision loss interviewed mentioned:

> "I can't see through his eyes like I can see through mine" (Relative of a visually impaired senior, personal communication, February 18, 2018).

This shows how hard it could be to transmit the right information regarding the symptoms experienced by those with vision loss and vision-related diseases.

Managing complex information: The depth of information, for a patient or family member of a patient, to process and understand about the disease they are experiencing may be overwhelming, and it is difficult to understand without a detailed healthcare background knowledge. One of the interviewees mentioned:

> "...just for me trying to navigate it and from watching my aunt navigate it, the systems, all the supports, are complicated. And you get different information, and sometimes, you are kind of responsible for either moving that information from point A to point B or for asking the appropriate questions to the appropriate person, ... you shouldn't need to have that expertise" (Relative of a visually impaired senior, personal communication, February 18, 2018).

Added to this, the information in the paper "The Perceived Needs and Availability of Eye Care Services for Older Adults in Long-term Care Facilities" mentions that older seniors "are often affected by neurodegenerative diseases leading to severe cognitive deficits and communication disorder" (Kergoat et al., 2014). This situation does not facilitate a patient to express the symptoms they are suffering.

Information on supporting organizations: Despite the efforts in advocacy, and the advertising and communication of the services that organizations supporting seniors with vision loss undertake, the current channels used are not reaching the

intended audience. During the research, it was found that the existence of these organizations and the type of services they offer was not evident for the possible clients. In one interview, CNIB was identified as the store that sells magnifiers and other assistive devices, but nothing more. When asked, the interviewee did not know about other organizations.

This lack of knowledge about the services provided can also be related to the lack of information about the possible needs of a senior experiencing vision loss. If people were aware of the different services provided by these organizations and that rehabilitation is part of the process to regain independence and quality of life, they would know what they need to look for and what to ask for to their physicians.

Referrals - Information from Doctors about organizations: during the research, it was also found that not all medical staff are referring patients to organizations supporting seniors with vision loss. Many variables can influence this issue, including a lack of information on the part of the physician, lack of time to explain to the patient the alternatives during the consulting appointment, or the lack of integration among the different services provided by the healthcare system (Health Professions Regulatory Advisory Council, 2010).

J. Psychological Adaptability & Support

Training for family caregivers: Added to the economic support mentioned previously, other needs like training on how to encourage the patient, what assistive devices should the patient use and how, and how to offer psychological support were mentioned during the interviews. Training on how to offer psychological support is not yet provided by the organizations for family caregivers. The researcher hasn't found offerings from the public sector. Some organizations do have assistive technology training directed to clients and meetings about sharing experiences and knowledge on technology use that are open to clients. Some also offer resources for relatives and caregivers to improve their knowledge of diseases and how to interact with visually impaired people. It could be inferred that these resources are not easy to find on the web.

Psychological support: Not only seniors but people, in general facing vision loss go through different stages that have been compared to the loss of a loved relative. As mentioned by the Alliance for Equality of Blind Canadians:

> “The seven phases of adjustment to blindness according to Tuttle and Tuttle (1996) are: (1) Trauma, Physical or Social, (2) Shock and Denial, (3) Mourning and Withdrawal, (4) Succumbing and Depression, (5) Reassessment and

> Reaffirmation, (6) Coping and Mobilization, and (7) Self-Acceptance and Self-Esteem. As one goes through each phase/stage, there is no set time frame in terms of how long a client/consumer will stay in one particular phase/stage. Also, one cannot overlook the importance of supportive family members and friends” (Tedrick, 2006)

It becomes clear that there is a need for psychological support for seniors with vision loss; some of the organization partially cover this issue through their socializing and experience sharing activities. However, this is not available until the client starts getting in contact with the organizations, which mainly happens after the Denial phase, at which time they get this psychological support. A gap in psychological support needs to be covered between the diagnosis of vision loss and the acceptance of this situation by the patient. Added to this, specialized psychological support delivered by medical staff is also required to complement the services provided today. The article “Psychologic Adjustment to Irreversible Vision Loss in Adults” states in their conclusions that “The overall findings indicate that IVL (Irreversible Vision Loss) often has negative effects on patients' quality of life and mental health and that such effects tend to remain over time” (Senra et al., 2015). Also, the research papers from Edith Holloway et al. manifest that “Depression is highly prevalent in adults engaged in low vision rehabilitation (LVR) programs, yet few receive support” (Holloway et al., 2016).

K. Family Support

Family support: During the interviews, it was found that in certain circumstances families can hinder the rehabilitation of a senior with vision loss. Issues like being ashamed of letting a senior use a white cane as Matthew li explains

> “Family can be helpful, but sometimes family isn't helpful, I had encountered families before that didn't want their parents using a white cane because they thought it was embarrassing but if you don't have a white cane it greatly increases the chances of you walking into things, tripping on things that you cannot see”. (Matthew Li, Orientation and mobility trainer, 2018)

Another case is when the family omits relevant information when translating for a non-anglophone senior:

> “I can speak a little bit of Chinese but not that well I was working with a client before and... I asked the family a question, and the family member translated, the client gave me answer that was like 2 or 3 minutes long, and then the family member just turns and told me: ‘no it's fine’ and I was trying to look at all the stuff that he said in between” (Matthew Li, Orientation and mobility trainer, 2018)

As it was stated by the book “Vision Loss in an Aging Society: A Multidisciplinary Perspective” there is abundant evidence asserting that the family plays an

important role in the rehabilitation of people with disabilities, including those who are visually impaired (Crews & Whittington, 2000).

6.2. What are the current strength points of the system that should be reinforced.

Volunteerism: Volunteerism is coming from both the sighted and visually impaired population. It helps to build a more integrated community, keeps visually impaired seniors connected, increases their quality of life through social activities, prevents withdrawal from the rehabilitation programs, spreads awareness and knowledge through talks and events, and helps visually impaired people in rehabilitation programs to develop skills faster and build capacity. The job done by the organizations with volunteers is essential and needs to continue growing to adapt to increasing demand and new social needs (CNIB, 2014b; CNIB, 2017b; IPSOS, 2017).

AODA Legislation: The AODA legislation is a first step for transforming the province into an accessible and a more inclusive region (Occupational Safety Group INC., n.d.). However, it needs to be updated with more information and harmonized descriptions regarding how to address accessibility, as not all areas are fully

informed (Toronto Transit Commission, 2017). On the other hand, regulation should be accompanied with strong awareness and advocacy programs to wake up curiosity and care, so regulations can be better perceived as a guide into how to address wanted change rather than a forcing measure for an unwanted change (Wilder, 2017).

Awareness & Prevention initiatives: Organizations and eye-care professionals that support vision loss rehabilitation are reaching more of the population through initiatives and programs that make diagnosis, prevention, and information more accessible. Such initiatives have been made in senior homes, schools, and areas that lack enough eye-care services. For example, the CNIB Eye-Van travels across northern Ontario twice a year to provide services in rural areas (CNIB, n.d.-e). However, interaction with clients in these programs confirms that even more awareness, prevention, and early detection are still needed. It was noted, for example, that 60%-70% of those examined in senior homes had further vision issues that were undetected. These issues could have easily been detected and treated earlier by more timely diagnosis procedures in the system (Organization's expert, personal communication, February 6, 2018).

The previous information helps to identify the relationship between current issues and stakeholders in the system and to understand where to look for signals of possible change in the future and what their implications may be in the current system.

7. PROBLEM FRAMING: EXPLORATION OF FUTURE POSSIBILITIES FOR THE SYSTEM OF VISION LOSS REHABILITATION

A foresight process is conducted to understand what risks and opportunities may emerge in possible future scenarios and propose a set of actions for these futures. It starts with a Horizon Scan, identifying different trends and emerging issues related to the system of vision loss rehabilitation in Ontario. Then four future scenarios are built based on a Double Uncertainty - 2 x 2 Matrix Tool. The output of this exploration with the risk and opportunities of each scenario will help to understand how to address these possible futures with strategic options.

7.1. Horizon Scan

A method which analyzes and filters emerging events and trends, and their implications which may trigger relevant changes in the future related to the system of vision loss rehabilitation in Ontario. The filtered result is then grouped into six areas which are explained below. A detailed list of trends and signals with sources can be found in Appendix C.

Demographics (Senior demographics / Immigration / Increased Life Expectancy)

Characteristics:

The percentage of the senior population is increasing along with the life expectancy of the citizens. This will bring an increment in healthcare, social services and other government spendings. To counterbalance this trend, the government is supporting the acceptance of a more significant quantity of migrants into the country.

Implications:

This increment in immigration also brings new languages and cultural backgrounds with which the government and the market will have to adapt. The process of adaptation to this new reality may bring different social behaviours, from inclusion to segregation, and may influence the household situation of many people.

Technology (Always Connected / Smart Homes & Digital Assistants / Automation of Transportation)

Characteristics:

“Always connected” is already a reality for many people in developed cities. Although there are still areas in Ontario without adequate access to the internet,

the adoption of new technology like 5G will complement today's wireless technology with higher speeds. This goes hand in hand with other developments like smart homes and digital assistants which today support people with many digital tasks through voice and audio with the help of a different array of sensors. Finally, the automation of transportation will make it easier for many to have accessible mobility available.

Implications:

With these developments, seniors with vision loss will require less support in many tasks and will be able to feel more independent. Sensor and audio activated devices can be of great help as a channel to interact and express themselves through social media, but may also alleviate family responsibilities and care, promoting a higher human disconnection and more senior isolation.

Health (Low Vision Prevention / Everyday Diagnosis / Low Vision Assistive Devices / Private Healthcare Services)

Characteristics:

Blindness Vision 2020, an initiative from the World Health Organization and mobile eyesight diagnostic platforms are examples of prevention initiatives to reduce low

vision diseases as much as possible considering that 80% of blindness in the world can be prevented. Along with these preventive measures, taking advantage of everyday technology to diagnose eye diseases is another path that is becoming relevant to tackle low vision diseases. Other developments are offering accessibility and inclusiveness to visually impaired people supported in GPS systems, audio or vibrating signals or connecting them wirelessly with sighted guides. Also, big corporations in the US are starting to develop and offer healthcare-related services for their employees, filling a gap of quality in the public healthcare service and small companies and start-ups are finding opportunities to deliver services not well addressed by the current system like online medical appointments.

Implications:

These improvements in health supporting vision loss issues may have significant impacts in the long run, like reducing the amount of rehabilitation needed for seniors while having an everyday and everywhere continuous eyesight diagnosis, identifying and treating any issues in an early manner. However, for those who are affected by irreversible vision loss, technical support and accessibility may not be enough, as these devices are not able to offer psychological guidance. So there could be a psychological spectrum need that remains unserved. The possibility of

the healthcare system changing hands from public to private sector may influence into a less risk-averse perspective, with newer and faster ways to deliver solutions. However, this faster approach from a private sector may come with more expensive services, non-integration of proprietary technologies or untested services with dangerous consequences.

Economic Shifts (Accessible DIY Tech / Universal Basic Income / Automation of Work)

Characteristics:

Do-it-yourself (DIY) technologies like 3D printing, minicomputers, and diffusion of how-to videos are largely more accessible, offering more flexibility, materials and speed, and many of the tools needed to create can be either rented or outsourced. Universal Basic Income (UBI) has been running in pilots in Ontario and around the world, looking for alternatives to improve quality of life while reducing government spending. Finally, many job positions will get some level of automation; although robots or programs will entirely replace some jobs, in other cases, it may support people and let them focus their energy in what is more valuable instead of spending time on operative tasks.

Implications:

Having DIY processes more accessible is amplifying the possibility for people to develop customized solutions for specific needs at low prices, shifting the focus from industrialized solutions to a more tailored service offering. It may be faster to build what is needed in a convenience store than buying it from an online seller. UBI may be a way to counterbalance the loss of working hours due to automation, decrease government expenses on healthcare, social programs and public safety resources. However, it may also discourage people from working. Automation along with UBI may trigger an increase in the percentage of the population with part-time jobs, and time to either look for other desired jobs or invest time in personal interests like volunteering.

Social (Social media moving masses / Accessibility / Ageism / Inclusive society / More services for seniors)

Characteristics:

Social media and the availability of digital devices everywhere is playing a significant role diffusing information and influencing people to take action for changing social issues not currently addressed. Accessibility legislation and inclusiveness initiatives from the private sector are influencing the transformation of cities, products and

services. However, ageism and lack of inclusion are still a phenomenon not solved; segregation instead of integration with active roles in society is one of the challenges not yet addressed. Along with this, the increasing percentage of the senior population has influenced the development of different offerings targeted to them with a focus on wellness, social and recreational programs.

Implications:

This more substantial percentage of seniors and accessibility to social media can leverage a louder voice against ageism, lack of services and segregation. Every year more seniors can be seen in social activities. Social technology can help them to get better organized and generate communities around shared interests.

City landscape (Climate Change Effects / Household Living Structures / Smart Cities & Private Neighbourhoods)

Characteristics:

Climate change is contributing to an increment of disasters around the world like rainfalls and extreme weather conditions. In some instances, forcing people to migrate to other countries. Household living situations are changing from the usual family structure to a variety of compositions like independent living, independent

within an organized structure like seniors care homes or coop housing, households with a mix of young students with older adults, or other compositions with four people co-parenting under the same roof. The increase of immigration may also contribute to these changes, as newcomers bring different cultural backgrounds and family with them. Added to this, there are ongoing developments and transformation of neighbourhoods and cities into smart ones using information and citizen's data to manage resources more efficiently. Some of these are managed and owned by private sectors.

Implications:

This increment of climate events can influence the quality of life and risks that seniors will experience in the city. The changes in living situations may influence the urban city layout and the support that people may have from relatives and acquaintances. The investment of the private sector in smart neighbourhoods may influence the accessibility and inclusiveness of those areas, who is going to have the power of decision over the land intervened and how citizen's data and their privacy will be managed.

7.2. Critical Uncertainty

The previous analysis helps us to foresee possible future scenarios with different implications that may trigger changes to the current situation of vision loss support services. This approach uses a critical uncertainty matrix which will help to determine the two more uncertain and impactful trends articulated through research to build a framework to develop the future scenarios.

The analyzed information gathered through the interviews and literature review influenced the distribution of the different trends and signals within the matrix.

By organizing the trends into the critical uncertainty matrix, it was identified that the spectrum of Private Healthcare services along with Inclusive Society are the trends that may impact possible futures the most, but are also very uncertain in how they may turn out.

CRITICAL UNCERTAINTY MATRIX

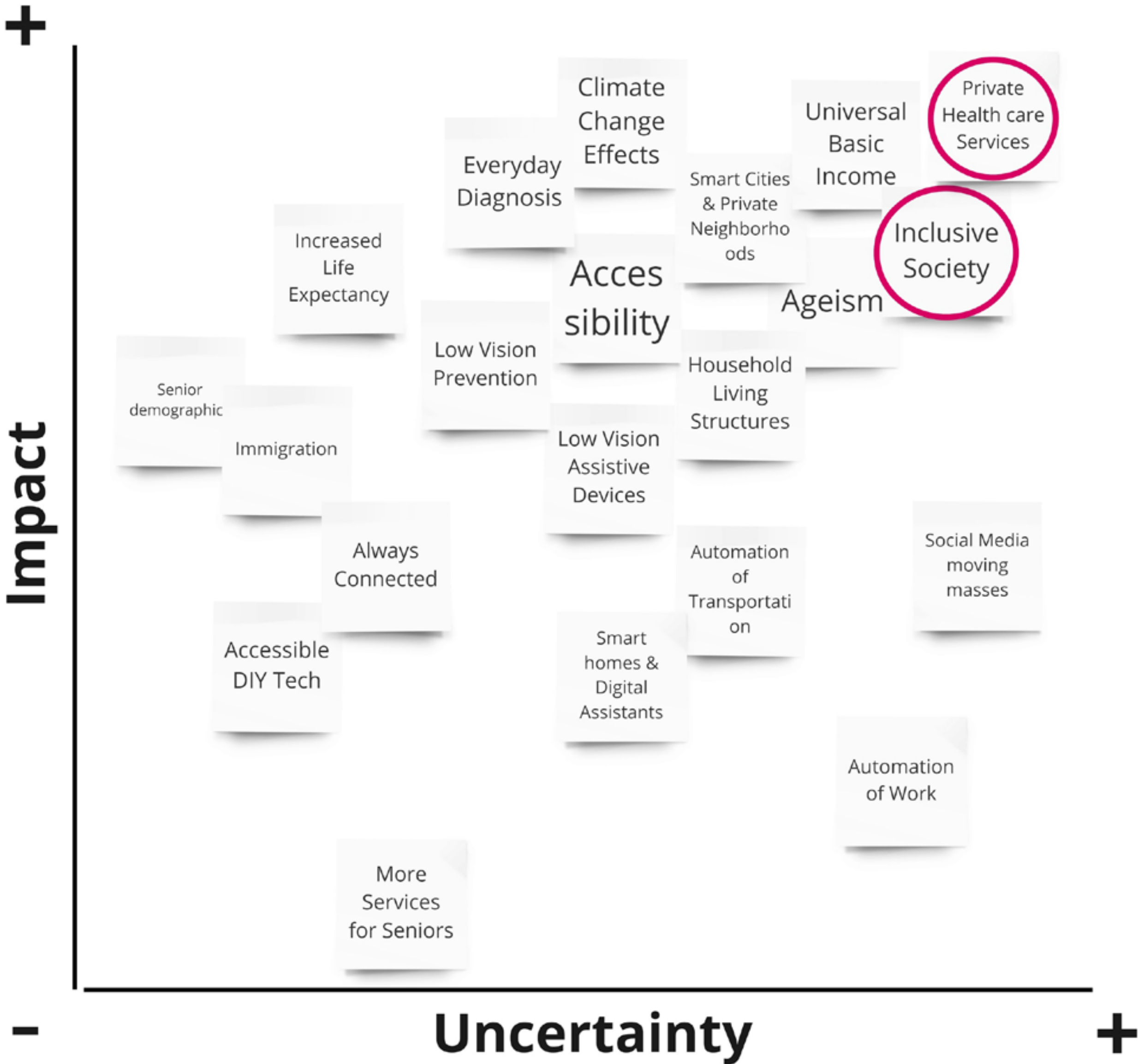

Figure 12 | Critical Uncertainty Matrix

Private and public healthcare services: It is uncertain if the government may open the path to the private sector to fully manage today's public healthcare system. Different than the private sector, the public sector “is a monopoly that lacks

both competition and a profit motive...protects incumbent producers and programs against disruptors ... possesses structural disadvantages that make disruptive innovation more difficult" (Eggers & Gonzalez, 2012). In contrast, a private healthcare service may tend to be less risk-averse, more innovative and may have more flexibility and efficient ways of using resources. However, this may also be accompanied by higher risks and untested products (Hvidman & Andersen, 2014). Private for-profit healthcare services may be organized under an oligopoly framework, where the biggest and more influential corporation may absorb the system. Alternatively, it could be gradual, through many different companies, each one specialized in one type of service delivery and not necessarily achieving an integrated system.

Inclusive and non-inclusive society: For this research, inclusiveness is defined based on the definition of social inclusion and social exclusion in the Report on the World Social Situation 2016 from United Nations.

> Social Inclusion is defined as "the process of improving the terms of participation in society for people who are disadvantaged on the basis of age, sex, disability, race, ethnicity, origin, religion, or economic or other status, through enhanced opportunities, access to resources, voice and respect for rights" (United Nations, 2016).

> Social Exclusion is described as “a state in which individuals are unable to participate fully in economic, social, political and cultural life, as well as the process leading to and sustaining such a state….participation is also limited when people cannot exercise their voice or interact with each other, and when their rights and dignity are not accorded equal respect and protection” (United Nations, 2016).

Therefore, an inclusive society can be understood in this research project as a state where citizens, organizations, and the public and private sector, carry on practices of caring, planning and executing actions that will provide opportunities of equal participation to people who are disadvantaged in any status. Examples of stakeholders in this research under this description would be seniors with or without a vision loss or other type of disability. These actions can be of any magnitude and complexity, such as voluntary support to guide a disabled person to a specific place, or the implementation of policies to make mass product development accessible to all the population without distinction.

To clarify the opposite extreme, a non-inclusive society can be understood as a state where the acts of some of the stakeholders and / or policies and regulations generate systemic segregation of part of the population. An example of sectors that might suffer segregation in the context of this research projects are seniors, visually impaired people or non-for-profit organizations.

There has been an increase of inclusive initiatives in the last years (Government of Ontario, 2017; Jermyn, 2018), and changes are appearing gradually (Smiley, 2017). Although in some dimensions, inclusivity may seem to be spreading thanks to influential movements, regulations or design ethics. However, social media technology, for example, has been making it easier for people to be and to feel isolated by minimizing human interactions (Vedantam, 2017). Parallel to this, in a society that values speed and dynamism as the way to develop and improve, the natural slower approach of seniors is perceived against the flow and is ignored or neglected (Butala, 2018).

7.3. Future Scenarios

To develop the scenarios, a double uncertainty - 2 x 2 matrix is used where the two trends that were previously selected define the axis for a four-quadrant framework.

Due to the scope of the research and because the type of information gathered was focused on a systemic approach of issues identifying different possible areas of intervention, the double uncertainty - 2 x 2 matrix has a strategic fit as the foresight tool to use. This method offers the possibility to explore future scenarios building-

up and re-articulating this information to develop four different future conditions that can be measured and compared under the same dimensions.

The matrix defined generates four scenarios as follows: The upper left side, Scenario A, considers private providers of healthcare services within a non-inclusive society. The upper right area, Scenario B, considers private providers of healthcare services within an inclusive society. The bottom left side, Scenario C, considers healthcare services provided by the government in a non-inclusive society. Finally, the bottom right area considers healthcare services provided by the government in an inclusive society. The horizon or time frame of the scenarios is 20 years forward, located in Ontario from the perspective of organizations supporting vision loss rehabilitation.

FORESIGHT 2 X 2 : Health care source vs Role of Seniors

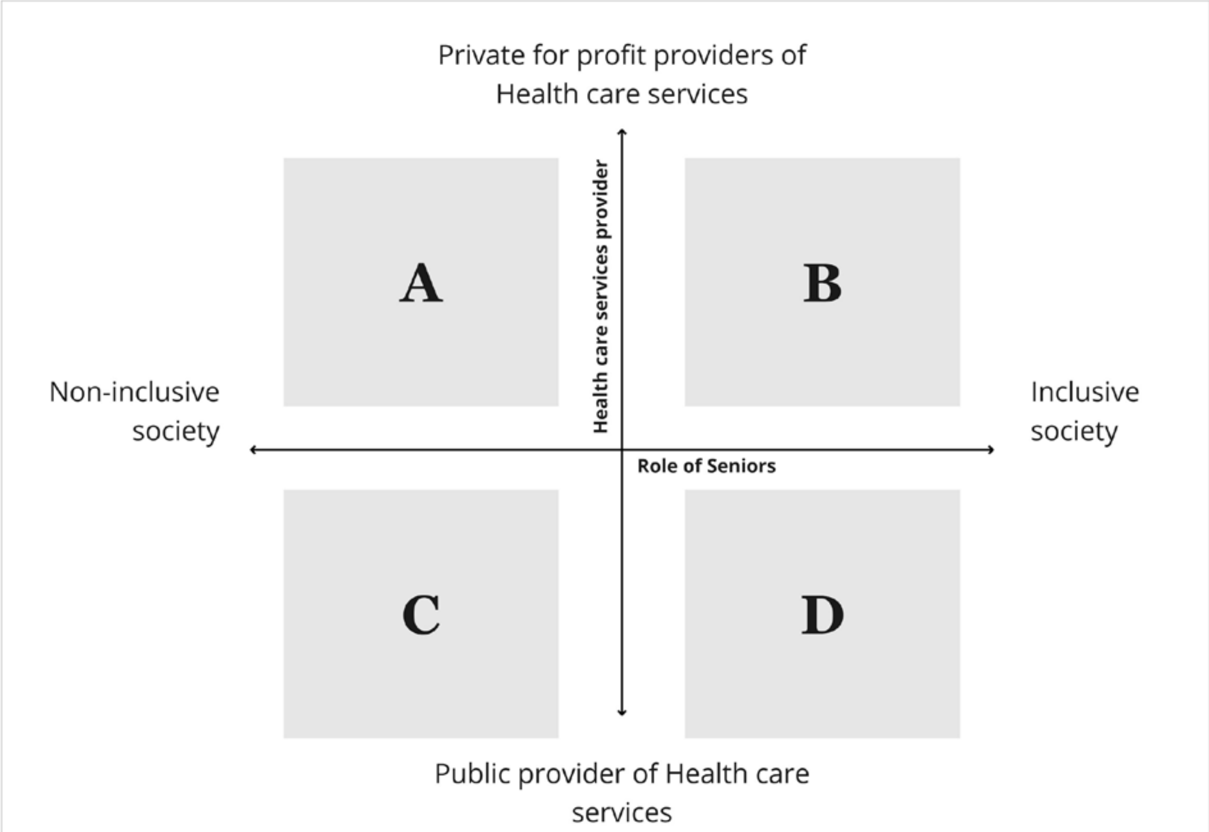

Figure 13 | Scenario Framework

The four scenarios are built based on five dimensions determined with the analysis made through the environmental scan and the Horizon Scan.

These dimensions are:

1. **Decision making:** Who makes the decisions and who has the power to regulate the environment?
2. **Resources for vision loss rehabilitation organizations:** Where do these organizations' resources (e.g. funding, human resources etc.) come from?
3. **Access to assistive technology:** How do visually impaired people get access to assistive technology or new technology that can support them?
4. **Guidance into and within the vision loss rehabilitation system:** Who guides people through the healthcare system and provides vision loss knowledge?
5. **Integration of vision loss rehabilitation stakeholders:** How are the different stakeholders of the vision loss rehabilitation system working together?

Each scenario has been developed with the four-quadrant framework and the five dimensions above, including possible influences from the trends, previously identified.

7.3.1. SCENARIO A - Private for-profit Healthcare & Non-Inclusive society

Table 1 | Scenario A

Decision making	The largest tech companies have risen in power (Oligopoly). Because of their stakes in the Canadian economy and access to citizen data, they have secured decision making positions in the political context. The focus of these companies is purely driven by economic growth and capitalism.
Resources for Organizations	Not-for-profit (NFP) organizations have had to form alliances with the private sector in order to subsist. These alliances are reliant on NFPs giving the private sector access to their clients' data in exchange for operational funding support. These relationships are based purely on economic exchange, so support for any project that contemplates inclusiveness (related to technology or otherwise) are only possible if revenue is involved. NFPs are trying to fill the gaps that the private sector is not addressing.
Access to assistive technology	Basic services are provided to the public as a standard, but services that cater to specialized needs like VLR or assistive technology are provided only as part of upgraded paid healthcare packages. They can also be acquired as standalone services but at a very high cost.
Guidance into the vision loss rehabilitation system	The three largest tech companies in the private sector created company-specific integrated healthcare systems to offer its employees employment benefits. The general public was later enabled access to these private integrated systems through a negotiated partnership with the government. The government directs yearly investments to the private sector in exchange for better and more integrated healthcare services. In turn, citizens now have to choose between three different providers to receive healthcare services. Standard services are offered for free as the basic package across providers, but certain special needs like VLR are only

	covered in paid healthcare packages. All the services are integrated and managed on automated digital platforms, so guidance is seemingly unnecessary. Machine learning utilizes the client data that feeds the system and help clients make decisions about their treatment.
Integration of vision loss rehabilitation stakeholders	NFP organizations support low income and marginalized populations, which don't receive enough subsidies. Government priorities are invested in growing city infrastructure and housing.

Risks

- Alliances with big companies in power will be difficult to negotiate as they will be dependant on a lucrative business model that guarantees a profit.
- Resources from the government towards support to organizations like CNIB or Balance for blind adults may decrease.
- Low-income populations will have a hard time accessing support.
- Total unquestioned reliance on automation for diagnosis and advice will result in a lack of awareness and knowledge in vision loss issues.
- Lack of human connection may isolate and increase mental health in patients with vision loss, which will increase the need for guidance or psychological support.

Opportunities

- Technology will facilitate follow-up and diagnosis of citizens.
- Vision loss may decrease because of early detection enabled by technology.
- Enough resources and knowledge to develop and try new assistive technology.

7.3.2. SCENARIO B - Private for-profit Healthcare & Inclusive society

Table 2 | Scenario B

Decision making	The government regularly consults with citizens and the private sector for decision making. The government regulates policies and laws that result from decisions made from these consultations.
Resources for Organizations	Many for-profit companies are providing healthcare services or part of it, to the population, resulting in many choices (of different quality) for citizens. Depending on the number of subscribers, the government gives service providers a monthly allowance to cover basic free access for the population. However, the policies determining what free access covers are inadequate and not clear. Because of a highly competitive market, many companies do not subsist for long. Although standard healthcare packages are free, they are very limited, and most of the people often switch between providers to get the next best deal. It is a complex system where fraud is starting to emerge. Government revenues are increasing because of the taxation imposed on these paid services. Part of the revenues is used to support organizations like CNIB, CCB or Balance for blind adults which seek to provide complementary healthcare services to low income and unemployed populations that do not have access to the services they need.
Access to assistive technology	Society values inclusivity, and the large senior population play a significant and active role in society. Advocacy to enhance support for the senior population, particularly through social media, has led to an increased government budget for senior's healthcare subsidies. This has opened up the possibility for seniors to access a wider variety of assistive technology.

Guidance into the vision loss rehabilitation system	Independent advisors are offering paid guidance services to help citizen navigate through the complex system of private healthcare providers, but there is no clear view on who to trust.
Integration of vision loss rehabilitation stakeholders	There are numerous different private providers with different digital platforms, and organizations that offer paid healthcare services. The services are not integrated into an overall system, making it difficult for citizens to know which providers to trust and understand how to align services from one company to another for complex care needs.

Risks

- With so many healthcare providers in the market, people are overwhelmed; there is no clear view on who offers an appropriate service for one's needs or where to go. At the same time, the quality of services may decrease. Given that the population is always connected, and that there is an increase in accessible channels to buy and access services, seniors are in more risk of possible scams.
- The lack of standardized services and the many different quality of services being offered prevent information from flowing adequately from one provider company to another.
- Rehabilitation may take more time because of a lack of integrated services.
- Funding depends on government priorities.

Opportunities

- Specific healthcare offerings are available for every need.
- Cost of assistive technology decreases because of a competitive market with many offerings.

7.3.3. SCENARIO C - Public Healthcare & Non-Inclusive society

Table 3 | Scenario C

Decision making	Government regulates; there is minimal engagement with citizens.
Resources for Organizations	Government priority is on improving city infrastructure and disaster-proof renovations. This has led to a decrease in government funding towards NFP organizations such as CNIB or Balance for blind adults. As such, NFPs have to turn to donors for support. Unfortunately, a less inclusive society is less willing to make donations. With the government and citizens more concerned about preparing the possibility of a future climate and economic crisis, resources have become a particularly difficult challenge for organizations supporting seniors with vision loss.
Access to assistive technology	Assistive technology is partially subsidized by the government, but the criteria to qualify for subsidies is very restrictive, making it difficult for citizens to access government support.
Guidance into the vision loss rehabilitation system	The complexity of navigating the healthcare system remains as it was for years. Organizations supporting vision loss rehabilitation are able to offer some guidance, but the onus is on citizens to access and contact the organization. There is still a big need within the population for knowledge and guidance on how to access and use the public healthcare system.
Integration of vision loss rehabilitation stakeholders	Stakeholders within the system work in silos, and integration is non-existent. The government still has a complex healthcare system, and organizations are trying to fill in the gaps, but efforts are ineffective without a strategy for service integration.

Risks

- Resources are reduced because government and citizen priorities are misaligned with the objectives of organizations offering vision loss rehabilitation services. This leads to diminished government funding and a lack of charity donations.
- Possible increase in population with vision loss due to lack of education and prevention.
- Lack of services for vision loss rehab may increase population in seniors care homes.

Opportunities

- An adequate centralized prevention service can reduce preventable blindness through diagnosis and reduce government expenses in future long-term senior care support.
- Self-organization and empowerment within an increased senior population could enable this population to better support themselves.

7.3.4. SCENARIO D - Public Healthcare & Inclusive society

Table 4 | Scenario D

Decision making	The government regulates and organizes vision rehabilitation services that are provided by the public sector along with private not-for-profit organizations. Citizens play a big role in decision making because of higher public engagement.
Resources for Organizations	Resources come from a range of stakeholders, including the government, donors and clients. The increased amount of volunteers due to Universal Basic Income (UBI) and immigration, which enables citizens to have the time and shared experiences to want to help.
Access to assistive technology	Assistive technology is partially subsidized, UBI helps people to acquire what they may need.
Guidance into the vision loss rehabilitation system	An increase in volunteers has resulted in self-organized service offerings through social media without major regulatory control. Many volunteers are offering free guidance to help citizens navigate the healthcare and eye-care system.
Integration of vision loss rehabilitation stakeholders	There is more integration between the public sector and the private, with NFP organizations delivering vision loss rehabilitation. A governmental body manages the overall system, which diminishes the flexibility that organizations once had years before. Any new service or relevant change that NFP organization may want to offer must be pre-approved by the government.

Risks

- Lack of sustainable, secure funding prevents long-term plans.
- Seniors may be misguided by untrained self-organized volunteers.
- Centralized governmental management of vision loss rehabilitation services may diminish flexibility for adaptation within the system, and may prevent organizations from growing or quickly adapting to changes concerning clients' needs.
- Higher rates of immigration may come with cultural and language barriers for adequate service delivery.

Opportunities

- Increase in volunteers may help push outreach to enable access to services within rural and less populated areas.
- Better integration and early diagnosis may diminish preventable blindness.
- Increasing needs for social activities.
- The increase of immigrant volunteers and immigration may help to break inclusion barriers and extend outreach initiatives to more diverse communities through the support of social technology.
- Government immigration services like language teaching or integration

workshops offered may be designed to include prevention campaigns.

8. PROBLEM FRAMING: CASE STUDY - CNIB VISION LOSS REHABILITATION ONTARIO & CNIB FOUNDATION ONTARIO

Given the Environmental and Horizon scan previously developed, it is possible to continue analysing how these scenarios may apply to one provider: CNIB (Vision Loss Rehabilitation Ontario and Foundation Ontario)

CNIB is the largest organization in Canada supporting vision loss rehabilitation, and its chapter in Ontario, Vision Loss Rehabilitation Ontario and Foundation Ontario are the biggest supporting seniors with vision loss in the region. It is a well-established organization and has the capabilities to expand their outreach to all parts of the province. It was also possible to establish regular contact with them and to have a better understanding of the institution.

8.1. CNIB Mission and Objectives

To determine how to address the overall issue, the needs of the system are analyzed through the perspective of CNIB Vision Loss Rehabilitation Ontario and

CNIB Foundation Ontario, which gives this project the opportunity to focus the recommendations into a specific approach.

Considering the perspective of CNIB from its mission statement and the objectives of the divisions of Vision Loss Rehabilitation Ontario and the CNIB Foundation Ontario is:

Mission:

CNIB as an Organization has as a mission to passionately provide community-based support, knowledge and a national voice to ensure that Canadians who are blind or partially sighted have the confidence, skills and opportunities to participate in life fully and no Canadian loses their sight to preventable causes (CNIB, n.d.-b).

CNIB Vision Loss Rehabilitation Ontario:

This division focuses on providing training that enables people who are blind or partially sighted to develop or restore key daily living skills, helping enhance their independence, safety and mobility (Vision Loss Rehabilitation Ontario, 2017a).

CNIB Foundation Ontario:

This division focuses on offering programs that complement and enhance rehabilitation services by addressing the **social and emotional needs** of people with sight loss and building their confidence and self-advocacy skills to ensure they receive the accommodations they need to succeed (CNIB, n.d.-a).

The above statements provide a framework into how to visualize the current issues and understand where the levers are that can create a relevant impact on the system.

We can group this perspective into three areas:

1. Offering support for more people in need, increasing outreach and capacity of support for a growing and partially served population.
2. Increasing awareness of vision loss issues and the services provided by CNIB.
3. Supporting gaps in needs for visually impaired seniors not necessarily addressed that may be preventing them from participating in life fully.

8.2. How CNIB target these goals

The following are services that CNIB offers to clients through their departments of Vision Loss Rehabilitation Ontario and CNIB Foundation Ontario.

Services Offered by CNIB Vision Loss Rehabilitation Ontario

Low vision services: providing information on eye diseases, conducts functional vision assessments, teaches techniques for maximizing eyesight, and provides instructions on helpful sight-enhancing devices (CNIB, n.d.-d).

Essential skills for daily living: providing instruction to help manage the essentials of daily life like safe and effective methods of cooking and other household tasks, how to use large-print, braille and audio products, and assistive technology in day-to-day routines (CNIB, n.d.-d).

Travel and mobility instruction: offering training in how to mobilize safely using a white cane and other mobility tools, riding public transportation or navigating new environments (CNIB, n.d.-d).

Assistive technology services: teaching how to use assistive technology, help on finding out what financial supports clients are eligible, giving assessments and provide recommendations for specific needs, helping get the tools clients need for their workplace or school (CNIB, n.d.-d).

Early Intervention program: supports children with vision loss from birth to school age and their families through services including "direct services, information resources, parent/peer support and advocacy training" (CNIB, n.d.-d).

Workplace Assessments: provision of a fee-based service to provide workplace accommodations to address challenges (CNIB, n.d.-d).

Programs and Services offered by CNIB Foundation Ontario (CNIB, personal communication, April 11, 2018)

Starting Kids on the right foot - Beyond the Classroom: empowering students who are blind or partially sighted to excel in and out of school.

Youth Empowerment: providing young people with the tools and opportunities to grow into confident, self-motivated and independent adults.

Building Networks of support: through vision mates which are home-based sighted volunteers that support people who have recently experienced vision loss with friendship and assistance in the home like reading mail and enabling individuals to get out in the community.

Peer Support and Mentorship: providing individual peer support and mentorship, as well as support groups delivered in-person, over the phone and online. Offering coping mechanisms for the emotional challenges of vision loss and sharing practical tips, advice and resources for living independently.

Living Life the Fullest – Lake Joe Centre: a fully accessible lakefront facility offering recreation and rehabilitation summer programs for all ages.

Culture, Recreation and Sport: providing opportunities for participation in a variety of programs, like knitting groups, art classes, visiting local attractions or camps for youth.

Raising a Voice Programs

Advocacy in Action: advocating for equality in all areas of society. From public policy to public education, opening lines of dialogue with politicians and decision makers to create a more accessible society for all.

CNIB Ambassadors: involving people who are blind and partially sighted in a variety of activities to share their stories, to help change perceptions, and educating all ages about vision loss.

Setting up for Success: providing career and employment support with tools and resources for those with vision loss to reach their career goals.

Literacy for all: ensuring that accessible materials are available to support literacy for those living with vision loss.

Accessible Technology: providing more advanced training opportunities in the latest technology available.

9. PROBLEM FRAMING: OPPORTUNITIES AND AREAS FOR INTERVENTION FOR CNIB IN THE SYSTEM

Converging on the issues identified in the system, the possible areas of action for CNIB and the risks and opportunities of possible emerging conditions in the future points to six areas for intervention that could be explored for developing potential strategic recommendations. This strategy exploration aims to give a more comprehensive view of possible planned actions for CNIB in case one or a combination of elements from these scenarios start to become a reality.

Awareness of CNIB: Increasing awareness of CNIB will ensure more people understand the overall services that CNIB offers and more patients referred to CNIB from eye-care professionals. A direct and effective communication strategy that can build resonance of the information is crucial. These actions may also indirectly influence more people to voluntarily take steps of prevention and reduce high levels of vision impairment.

Activate volunteers: Volunteers are an essential resource in the process of delivering vision loss rehabilitation services. Training volunteers and being able to

assign them roles they want to fulfill will help to increase the capacity of the organization to outreach to more clients and offer support for a larger population. It may also help to expand the services to types of needs not yet addressed. Volunteers may come from different places, ages and cultures which is a characteristic that can be harnessed in some of the future scenarios. It becomes essential to understand which channels should be used to reach them and how to support their involvement.

Diversify funding sources: Sources of funding may change in the future; diversifying sources will prevent sudden changes in funding and more capacity for long-term planning. Activating new sources of funding or revenues and understanding how to use CNIB's knowledge to leverage alliances with the private and public sector becomes critical.

Guiding and training when needed: Guidance through the process of treatment and rehabilitation is a need found in all the scenarios although it may be required in different ways depending on the conditions of each scenario. For example, the guidance needed may be psychological, for acquiring services, for understanding health-related concepts, for navigating a complex eye-care system or for making

health-related decisions. The possibility of online training or tele-support for volunteers and family caregivers in remote or unreachable areas may become essential for expanding services with the efficient use of resources.

Flexibility of services: The high capacity required today for skills training and adaptation for visually impaired people may change in the future with adequate prevention, diagnosis and more intuitive and accessible assistive technology. It is critical to develop the flexibility to reorganize resources and adapt services to different needs to remain resilient in a dynamic future.

Harness Technology: Technology may become a lever to build capacity and expand the area of influence of the services delivered. Support based on social technology and web-platforms may improve volunteer outreach, the training of volunteers and family caregivers, improving awareness and prevention. Technology may also be used to extend rehabilitation services to places with no support or to cope with language and cultural barriers. Finally, involvement with entrepreneurs in early stages of technology development may be critical to advocate for it to be inclusive by default.

10. POSSIBLE SOLUTIONS: EXPLORATION OF STRATEGIC ACTIONS FOR CNIB

To address these opportunities and areas of intervention, the following is an exploration of possible strategic actions for CNIB to remain resilient while facing the implications of possible changes such as those identified in the scenarios. A wind tunnelling method was used to understand better and assess how well these actions might perform within the conditions of different possible futures, and to optimize them in order to make the most robust strategic recommendations to CNIB. A description summarizing the potential effects of these conditions is included after each set of strategic actions below.

10.1. Strategy exploration and Wind tunnelling results

Awareness of CNIB:

- Identify relevant channels active with people who are interested in health topics, wellbeing, inclusion, volunteering, and social causes (i.e. Bunz helping zone, meetups, social media).

- Increase the number of awareness and advertisement campaigns for CNIB services with the general population, and through the previously identified channels for sharing information with target audiences as prevention awareness before the development of any vision loss issues.
- Strengthen alliances with universities, incubators, and accelerators that are developing new services or products. Involve visually impaired volunteers to leverage research and innovative ideas and tackle inclusivity and accessibility.

These actions may not perform well in scenarios with a lack of central governance and where inclusivity is not valued. In these cases, it is important to start driving awareness of CNIB and its objectives to the public and other stakeholders, particularly the senior population, as early as possible, and to showcase the relevance of the seniors' experience in a profit-driven society. With more awareness and information sharing, this could result in growing self-organization capabilities within the senior population itself, which CNIB can also leverage. On the other hand, in scenarios with an inclusive society, these strategic actions may perform very well. If that is the case, the organization should focus on pushing available resources to implement and optimize the results of these strategic actions.

Outreach:

- Outreach to potential volunteers through established social networks, local community groups, and improve the volunteer database. Identifying volunteer characteristics such as languages spoken, culture background, technical knowledge, experience in leading groups, or other skills would become relevant to address specific needs accordingly.
- Identify and use social technology that may help to keep communications with the volunteer network, whether they are visually impaired or sighted.

These strategic actions perform well in all the scenario conditions identified, except for action five. In scenario B, where a wide variety of ephemeral service provider alternatives may be available because of its inherent instability; identifying and analyzing social technology may be very difficult and a big risk. It will not be easy to keep few channels alive without people migrating to other channels. If possible, keeping alternative side channels active like mail or SMS messages with a compelling user experience may minimize this weakness. The organization should be aware of any possible shift that may affect its main channels of communication.

Activate Volunteers / Guiding and training when needed:

- Prepare training packages for sighted and visually impaired volunteers, and identify different roles they may have in ways that can leverage their personal experience and skills.
- Support on technology to help volunteers increase their capabilities and capacity for client guidance (i.e. how can technology help a volunteer to guide clients through the healthcare system)
- Identify opportunities to develop training programs and expand rehabilitation services online to areas that are not widely supported, particularly with the collaboration of family caregivers and volunteers (through platforms like YouTube, Lynda, and technology like wearable devices).

These strategic actions, like action number five, may be affected under conditions where channels of communication and consumption of information are not stable and vary frequently. At the same time, under these conditions, the need for guidance and training may become especially critical because of the inherent complexity of the healthcare system due to the considerable number of services choices available. Advocating and leveraging government communication services

may be an alternative to overcome this condition. Depending on the specific conditions of future scenarios, the focus on what kind of guidance and training may be needed could shift.

Diversify Funding Sources:

- Identify CNIB's possible value offerings that may be leveraged to generate revenues in the private sector.
- Identify gaps in the market that could become an opportunity to fill for CNIB's distinctive value offering. (e.g. consulting for AODA compliance in private sector).

Given scenario B's conditions of a very dynamic market where the sustainability of small and medium companies may not be perceived as secure, investing in external services like the ones CNIB may offer to generate revenue, may be seen as a risk that could strongly affect their budget. In this scenario, developing small sets of services or offering services targeted to groups of companies at the same time (e.g. workshops or courses) would be an alternative to minimize the perception of risk investment. Where there is a public sector with robust budget capability, the focus

should also be to involve the government to subsidize these services for the businesses that partner with organizations like the CNIB.

Flexibility of services:

- Incentivize staff to learn and practice different skills; provide mentoring programs to improve internal capabilities, and acquire flexibility to address demands for various services.

This last strategic action performs well under all four scenarios, mainly because the control to incentivize staff on diversifying their knowledge depends on CNIB and its culture. It is worth noting that in scenario D, although the performance of this action is good, the rigid governance within this scenario may hinder the possibility to shift the focus of the services.

Harness Technology: Most of the previous options contemplate technology as a way to leverage on its impact in the future.

11. SOLUTION SELECTION: OPTIMIZED STRATEGY RECOMMENDATION

The following strategy was developed focusing on a prioritization of strategic actions for CNIB to remain resilient under possible future changes in the environment. Rather than a radical approach, a reinforcement of some of the current activities from CNIB is being proposed along with new approaches which are focused on distance service delivery supported by available technology, building capabilities of self-organization for the senior population and flexibility of internal staff capabilities. This optimized strategy is the following:

11.1. Awareness of CNIB

This strategic action looks to increase awareness of the CNIB brand and what services CNIB is offering.

Although CNIB is a recognized organization, there is a part of the population that is not aware of it and of the kinds of support they offer.

If patients are not aware of what they can access, they will not be able to demand or seek out these services in cases where it is not offered by their healthcare physician.

Another spectrum covered by these strategic actions is volunteerism. The more aware people are about CNIB, the more top-of-mind the organization's brand will be when people are thinking about volunteering.

Strategic Actions:

If conditions indicate a medium or high level of inclusiveness, the organization should focus on the following:

- Identify relevant channels active with people who are interested in health topics, wellbeing, inclusion, volunteering, and social causes (i.e. Bunz helping zone, meetups, social media).
- Complement the channels currently used with these new ones to increase awareness campaigns and advertisement of CNIB services with the general population before a possible development of vision loss may occur.

- Strengthen alliances with universities, incubators, and accelerators developing new services or products trying to involve visually impaired volunteers whenever is possible. In this way, advocating for inclusiveness bottom-up will complement the current efforts done through other channels.

If conditions related to lack of inclusiveness are predominant, the organization should focus on the following:

- Building capabilities of self-organization for the senior population, allowing them to build a community of support that can complement CNIB services and offer support for areas out of CNIB's capabilities.

It is essential to start as early as possible and maintain the flow of communication in all channels in case conditions of instability in communication channels start to emerge.

By raising awareness of CNIB and its services with these actions, new channels of communication may be established with a wider target market. This wider audience may help with CNIB's outreach efforts, so that more clients and volunteers may

help to extend prevention and fundraising campaigns through other channels than the ones used today.

11.2. Activate Volunteers / Guiding when needed

The following strategic actions look to improve outreach of volunteers and their capacity, offer the possibility for volunteering to people in areas that are out of reach for CNIB, offer online-training to family caregivers, and provide support for volunteers and relatives to guide visually impaired seniors through the healthcare system and understanding their disease.

Volunteers are an essential element for CNIB to provide their services to their clients. The ability to increase the quantity and diversity of volunteers may result in higher flexibility and a larger area of influence for the organization. Insights of this research showed the need to improve volunteer training, and to give them more opportunities to select roles according to their preferences and skills.

Although CNIB services do not reach every corner of the province due to limited resources, areas that are out-of-reach for the organization can develop support by leveraging volunteers through online-training.

The need for training expressed by relatives on how to better support a senior with vision loss can also be addressed with online-training to improve care and support. This online-training can complement the existing tools offered by CNIB such as its playlists like “Tips for Everyday Living”(CNIB, 2014a) or “Tech Tips”(CNIB, n.d.-h) or the Booklet “Living with Vision Loss”(CNIB, n.d.-g). However, it is relevant to note the need to make them easier to find for the general public.

The need for guidance to navigate through the complex healthcare system and for understanding the information related to the diseases is another issue expressed by the interviewees. Support tools may activate volunteers, relatives, and visually impaired seniors to face this issue.

Strategic Actions:

Under the possible future conditions of high dynamism, a vast portfolio of services available in the market, and low stability, the focus of the following actions could be directed through analog channels of communication or leveraging government alliances to develop channels that will remain constant over longer periods of time.

- Frequent local community groups and use the channels established on the first set of strategic actions for outreach to volunteers and grow the volunteer database. Build a comprehensive database with the different strengths and preferences of each volunteer like languages spoken, cultural background, technical knowledge, experience leading groups, or other skills that may become relevant to address specific needs.
- Identify if channels currently used are enough to maintain communication with the volunteer network and if there are channels not being used that may expand the possibility for outreach.
- Prepare and provide training packages for sighted and visually impaired volunteers that will let them feel more prepared to carry out their roles, and decrease the possibility of withdrawal.
- Offer online-training opportunities for volunteers in out-of-reach locations. If possible, invest in technology support to offer online-training to seniors with the support of local volunteers assisting the senior on site.
- Improve search engine optimization results for the instructional videos on CNIB's YouTube channel to make them easier to find for people looking for how to support visually impaired people.

- Complement the instructional videos with more training packages directed to relatives and caregivers of visually impaired seniors.
- Use other training channels like Coursera or Khan Academy to diffuse knowledge to a broader audience, and include support in languages other than English or French depending on the needs of the moment related to immigration trends.
- Develop tools to guide seniors and relatives with use of the healthcare system, knowledge of diseases, and how to access all the services available, including CNIB services.
- If needed, keep side channels active like mail or SMS messages with a compelling user experience.

The focus on volunteers, caregiving, and guidance can have a significant impact on the system, particularly for direct clients as well as other stakeholders that are part of the system, but not necessarily engaged with CNIB. As efforts with a focus on these areas can be of benefit to other regions, funding could be proposed as a collective effort with other CNIB chapters. It would be of greater benefit if these sets of strategic actions can be developed collaboratively with the other organizations,

keeping channels open for information sharing so that all chapters can have access to the same resources.

11.3. Diversify Funding Sources

These strategic actions look to strengthen the influx of funding by diversifying the sources of revenue.

CNIB Vision Loss Rehabilitation Ontario is receiving the total of their funding from the Local Health Integration Network Ontario (LHIN). CNIB Foundation Ontario supports itself with donations and fundraising revenues, with large proportions coming from expensive external fundraisers. If the government, for any reason, needs to change their funding priorities, CNIB may suffer a significant change in the amount of funds it receives. The following strategic actions, along with several above, address this possibility by identifying options to diversify revenue sources, as well as increase and activate volunteer resources through publicly accessible technology.

Strategic Actions:

Under conditions of instability, if there is strong support from the government, these strategic actions may not be a priority. However, even small amounts of resources should be invested in looking for alternatives to diversify CNIB's sources of funding.

- Identify possible value offerings that CNIB can develop or leverage to generate revenue.
- Identify gaps in the market that may be filled by CNIB with these new value offerings.
- Develop and activate campaigns showcasing the relevance of seniors' involvement and experience as part of the product and service development process.
- Define, depending on the dynamics of the market, the characteristics of the value offering that is to be developed.
- Alternatively, advocate for or leverage government programs that subsidize CNIB for offering services to the private sector.

Although these strategic actions are not looking to totally replace the influx of revenues that CNIB has today, they are trying to diversify the sources to allow for more flexibility for action under critical situations. They also have the possibility to expand the current offerings of CNIB, so that it can offer services to a larger audience in the future.

11.4. Flexibility of services

This strategic action looks to increase the flexibility of CNIB staff to assume different roles in case the needs of the targeted population start to shift.

The current staff of CNIB is highly specialized to offer the services that clients need to rehabilitate and regain their quality of life. However, changes in demographics, in social behaviour, and in technological advancements may considerably shift the type of services that clients may need. This may make it necessary for CNIB to reallocate human resources accordingly to tackle this shift.

Strategic Action:

Under conditions with strong control over CNIB services from an external entity like the government or a healthcare organization, investing resources in this strategic

action may not be as relevant as with other conditions. If needs of the clients start to shift and there is a requirement for new services, fast action and external alliances may help to minimize the risk of having to do an internal restructure.

- Incentivize the staff to learn and practice different skills, provide mentoring programs to improve internal capabilities, and acquire flexibility to address demands for various services.

Increasing the possibility of the staff to assume different roles if needed may give CNIB the opportunity to remain flexible in case a shift in needs of the clients emerges. It will be also less expensive to accommodate staff internally than to have to hire new staff to face these possible changes.

12. POSSIBLE NEXT STEPS AND PERSONAL LEARNINGS

This research was focussed on the question of **How might organizations such as the CNIB provide adequate support now and in the future for a growing and partially unserved population of seniors with age-related vision loss** and took us on a journey where we understood that not a simple approach can be taken to solve the problem of vision loss rehabilitation in Ontario. Systemic problems require tools that can help to visualize issues from different perspectives and understand how the different elements influence the others.

Next Steps:

This research offers a first step into future thinking and planning. The same methodology may be used for other departments and organizations to build a bigger integrated approach involving bigger stakeholders like the healthcare system or the provincial government and develop a high-level strategy. Because of resources and the scope of this research, some topics were not thoroughly researched that may complement the information gathered for this project:

Deafblind and Guide-dogs sub-systems: Although these sub-systems were mentioned, they were not researched as the repercussions of being deaf-blind or the support of guide-dogs are linked with a different array of implications, stakeholders, training services and therapies. Further research may be conducted in the future to complement the current information and strategies.

Extend Interviews to more stakeholders: although many different stakeholders were involved to have a 360-degree view on the problem, some experts and representative stakeholders were not possible to contact. Inclusive design experts, senior care home workers, policymakers and visually impaired seniors from rural areas could be interviewed to validate and complement the insights gathered.

Personal Learnings:

Where to start and how to converge: Understanding how to focus this research was not an easy exercise, the best approach I found was to start researching topics of my interest, looking to understand the underlying implications of the

combination of different factors. Diverging was always the easy part, where my inherent curiosity was in part an ally and part an enemy. Limits and deadlines became the weapon and the inner voice. Diagrams were my thought process and helped me converge into specific actions, decisions, and paths.

Systemic issues: there is always a why behind a why. These whys interconnect multiple stakeholders and variables. Finding the barriers preventing a better service is a first step, understanding who are involved and what are their motivations is the second step, analyzing where and what kind of actions should be implemented follows. Then reviewing what implications these changes may trigger or influence, and if the result is not adequate, iterate.

13. CONCLUSIONS

This project has explored a process to develop strategic actions that can complement the capabilities of CNIB Ontario to remain resilient if unexpected future conditions emerge.

The combination of different domains and methods are essential to have a broad perspective on the issues that the system faces. Design thinking permitted to have a human-centred approach to find possible solutions. Analysing and testing iteratively allowed the research to reach more valuable solutions. Systems thinking allowed to understand the power dynamics of stakeholders and the elements of the system, analyze the interactions between them, and identify locations to develop actions that can be impactful. Foresight enabled the researcher to foresee possible future conditions that can test the strategic actions created, then refine them and optimized the final proposal.

Vision loss rehabilitation is a sophisticated service integrating different stakeholders from different areas. It is a large system that serves the purpose of improving quality of life of visually impaired people and helping them to regain their

independence. However, some factors may trigger important changes in the system. The increase of senior population, inclusiveness and ageism, immigration, or the incursion of a private for-profit sector in healthcare, are some of the factors that may play a positive or negative role in how vision loss rehabilitation services may be delivered to seniors in Ontario.

The methodology used is addressing these possible changes and uncertain futures, offering CNIB Ontario a set of strategic actions to remain resilient if any of the studied conditions emerge.

The contributions of this research project are:

- Establishing a strategy with a specific array and prioritization of different actions with the purpose of maintaining the ability of CNIB and its divisions to be resilient if unexpected future conditions emerge.
- Building an overall methodology that might be replicated in different contexts with a range of magnitudes.
- This project was also conceived in a way that other organizations can benefit from the research, giving them future scenarios to evaluate their own

strategies and identify their robustness and flexibility against unexpected conditions.

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15. Appendix A - Interview Guides

15.1. Organizations supporting vision loss staff

- Can you please tell me about your role in the CNIB?
- How does the organization work in Canada? How is it organized along the provinces? In Ontario?
- From your perspective, what are the main priorities of the organization?
- What are the different ways the organization provides help?
- What are the challenges or barriers the organization face that prevents adequate support (personal, and systemic) for seniors with age-related vision loss? What are the main struggles the organization faces?
- How or when is the first point of contact with a senior with vision loss? What usually happens next?
- Is there a categorization of the clients regarding their needs?
- Is there a difference concerning how well a senior may adapt or get support regarding the social or family structure of the subject? How?
- Who are the main stakeholders in the system providing support for seniors with age-related vision loss - personal (i.e. family), public (social services)?
- After a first contact is established, how the relationship between the organization and the senior is maintained?

- How does the organization support itself economically, from where does the organization get funds?
- What are the many resources needed to provide a good service? Do you have them? Funds, volunteers, what else?
- What other organizations you know provide support services for seniors with vision loss? Would say these are complementary services? What would be the difference?
- From your professional perspective, what changes to the support and inclusion of seniors with age-related vision loss do you see coming in the next 10-15 years?
- What good examples of policy or social services do you know that have been implemented (in Canada / internationally) to support seniors with age-related vision loss?
- Who else would you recommend to be interviewed, how would you suggest would be the best way to get in contact with seniors with vision loss?
- May I contact you if new questions emerge? These could be done by email if you prefer.

15.2. Ophthalmologists and optometrists

- What is your role and what are your main priorities related to the treatment of seniors with vision loss?
- What are the most common illnesses causing age-related vision loss?
- Is there a way of grading or levels of vision loss apart from sighted and legally blind?

- What usually happens when a senior starts to lose its vision irreversibly? What are the main symptoms of losing sight?
- How/when is the first point of contact between you and a senior with age-related vision loss?
- How are the interactions with your patients through time? Is there a follow-up control, who is in charge of the follow-up?
- Does your role as an ophthalmologist include support in the way they learn to adapt to this new situation?
- Who else, (organizations, professionals) plays an important role in supporting seniors with vision loss?
- What do you think are the main challenges or barriers preventing adequate support (personal, and systemic) for seniors with age-related vision loss?
- What good examples of policy or social services do you know that have been implemented (in Canada / internationally) to support seniors with age-related vision loss?
- From your professional perspective, what changes to the support and inclusion of seniors with age-related vision loss do you see coming in the next 10-15 years?
- What advice would you give to a senior that is losing their vision?

15.3. Family Caregivers

- What are the main tasks you do to support your relative with vision loss?

- What are the main barriers you find for giving adequate support?
- What is the most difficult part of caregiving your relative?
- Who else is involved in the process/system that provides support to your relative with vision loss or to you in your caregiving?
- What do you think are the current social issues affecting your relative?
- In your experience, who or what causes might be contributing in generating barriers that hinder the delivery of adequate support to seniors with physical disabilities?
- Have you seen any changes in the way the caregiving service has been delivered in the last ten years?
- Have you heard about new approaches in the way the government or other organizations/countries can better support seniors with vision loss?
- What advice would you give to organizations supporting seniors with age-related vision loss?
- From your perspective, what big changes to the support and inclusion of seniors with age-related vision loss do you see coming in the next 10-15 years? (good and bad)

15.4. Seniors with age-related vision loss

- How may your typical day be like?
- When did you start losing your sight? What happened?

- How has your life changed after this event? How did you learn to adapt to this new phase?
- What have been the most difficult?
- Do you receive support from any organization? If so, from who?
- How did you get to contact (name of the organization) for support?
- What has been more valuable from the support you are receiving from this/these organization(s)? Was it what you expected?
- What do you think may be improved or is missing from the support you are receiving?
- Does your financial situation changed because of vision loss?
- From your perspective, what changes to the support and inclusion of seniors with age-related vision loss may be needed for the next 10-15 years?
- What advice would you give to someone who is starting to face an age-related vision impairment?

16. Appendix B - Vision Loss Support System Diagram

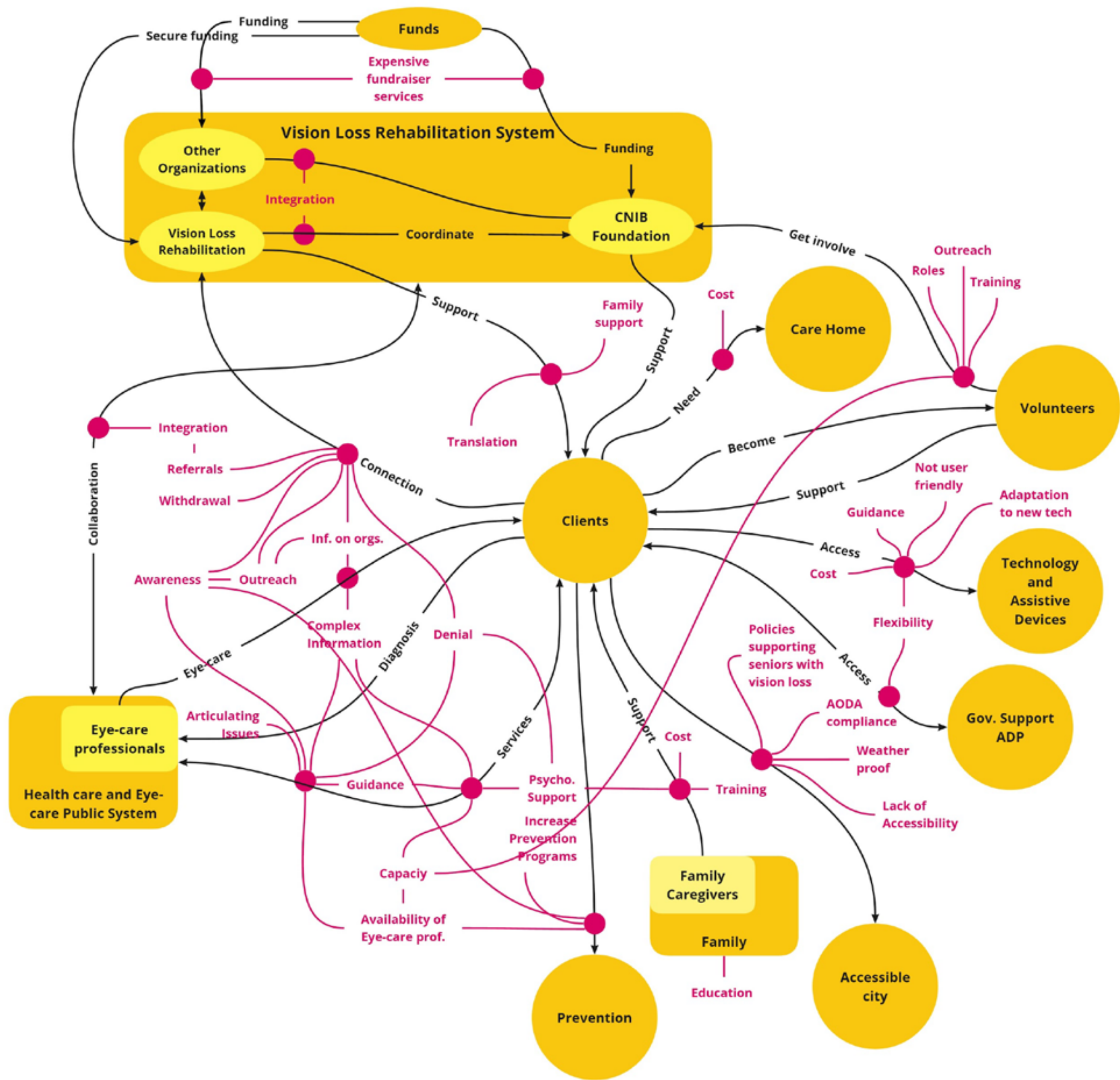

Figure 14 | Vision Loss Support System Diagrams with current issues in red

17. Appendix C - Trends and Signals

Increase of immigration - Environmental, Political, Social

Government is supporting an increase in the population of Canada through immigration. A future decrease in the percentage of the workforce and an increase in the senior population will affect the economic growth of the country and the amount of revenue that the government collects, which will impact the support and investment that the government can provide to the population.

Sources:

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http://www.cbc.ca/news/politics/immigration-canada-2018-1.4371146

Climate change effects and disasters - Environmental, Social

Climate change is contributing to an increment of disasters around the world like rainfalls and extreme weather conditions. Floods and windstorms have increased six times since the 1950, and the planet's average temperature has increased 1.1-degree Celsius since the late 19th century. These effects can influence the quality of life and risks that seniors will experience.

Sources:

https://climate.nasa.gov/evidence/

https://www.munichre.com/topics-online/en/2017/10/climate-change

http://www.worldwatch.org/node/4127

https://www.griswoldhomecare.com/blog/how-climate-change-affects-seniors/

Automation of transportation system - Environmental, Technological, Social, Economic

The automation of the transportation system will generate a change in the mobility of citizen, from sharing mobility solutions, decrease of congestion, increase road safety and improve accessibility for people with disabilities.

Sources:

https://link.springer.com/article/10.1007/s11116-017-9816-9

http://www.tc.gc.ca/en/programs-policies/programs/program-advance-connectivity-automation-transporation-system.html

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https://www2.deloitte.com/content/dam/Deloitte/uk/Documents/bps/deloitte-uk-transport-digital-age.pdf

Increase of Senior Population - Political, Social

With a low fertility rate, an increase of life expectancy, and baby boomers turning 65 over the last five years, the population of seniors is increasing relative to the rest of the population. This situation will increase healthcare, social services and another government spending vs a decrease of the percentage of employed people which comes with a decrease in the tax revenue collection.

Sources:

http://www.statcan.gc.ca/pub/91-520-x/2010001/aftertoc-aprestdm1-eng.htm

http://www.cbc.ca/news/politics/2016-census-age-gender-1.4095360

https://www.theglobeandmail.com/news/national/census-2016-statscan/article34882462/

Blindness: Vision 2020 - The Global Initiative for the Elimination of Avoidable Blindness - Political, Social

The Vision 2020 initiative from the World Health Organization looks for a collaborative world movement to prevent low vision diseases and blindness. Around 80% of blindness in the world can be prevented.

Sources:

http://www.who.int/mediacentre/factsheets/fs213/en/

https://www.iapb.org/member/vision-2020-canada/

Longer life expectancy - Political, Social, Economic

Life expectancy in Canadians is expected to increase from 83.94 for females born in 2010 to 87.09 for females born in 2030 and from 79.1 for males born in 2010 to 83.9 for males born in 2030. This increment comes with related issues which will increase the demand for health services and social services and activities tailored to the senior population. (http://www.cbc.ca/news/health/life-expectancy-lancet-1.3993213)

Sources:

https://www.statcan.gc.ca/pub/82-624-x/2014001/article/14009-eng.htm

http://www.cbc.ca/news/health/life-expectancy-lancet-1.3993213

http://nationalpost.com/sponsored/research-innovation/thanks-to-innovative-therapies-canadian-patients-are-living-longer-than-ever

http://www.huffingtonpost.ca/ted-bruce/canadians-living-longer_b_12900896.html

Private integrated services including Healthcare - Political, Technological, Social, Economic

New healthcare related services are being developed and explore by private companies. The venture comprised by Amazon, Berkshire Hathaway and JPMorgan Chase announced in February 2018 they are looking to provide their employees with better and cheaper healthcare. Apple is on the same road opening medical clinics to provide healthcare to their employees. Other private companies are entering the market for healthcare provision. Uber launches Uber-health platform providing transportation for non-

emergency medical transportation. Teladoc provides medical consultation through online platforms or phone. Verily (part of Google's Alphabet company) is entering the health insurance market.

Sources:

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https://league.com/ca/employee-benefits-experience/

Universal Basic Income - Social, Economic

Universal Basic Income (UBI) is "A periodic cash payment unconditionally delivered to all on an individual basis, without means-test or work requirement"

(http://basicincome.org/basic-income/). Current pilots are already being put in place to test the viability of UBI in Ontario. UBI may be helpful to increase employment, decrease government expenses on Healthcare, social programs and public safety resources. On another side, critics to the basic income argue that it will discourage people from working, Other places are experimenting with UBI among them we found: Finland, Kenya, The Netherlands, and Oakland, California.

Sources:

https://www.ontario.ca/page/ontario-basic-income-pilot

https://globalnews.ca/news/3399407/what-you-need-to-know-about-ontarios-basic-income-plan/

(http://basicincome.org/basic-income/)

https://www.theguardian.com/world/2017/apr/24/canada-basic-income-trial-ontario-summer

https://www.theglobeandmail.com/news/national/what-is-basic-income-and-who-qualifies/article34795127/

More treatments, interventions and devices in Healthcare to help seniors with vision loss - Technological

New technological developments are focusing on giving seniors and visually impaired people new opportunities to cope with visual disabilities better and easily. For example, the possibility to sense emotions, people laughing or going sad, through vibration with the

Emotion Whisperer. Another technology in development is a beacon navigation system like iBeacons mentioned before or the Microsoft 3D soundscape technology. These systems let people use audio cues to navigate a space and locate different spots or objects. Another example called Aira connects wirelessly one sighted person to a visually impaired one, and the sighted person is able to guide and give audio descriptions of what they see through a camera attached in the lenses of the person visually impaired person.

Sources:

https://www.engadget.com/2018/03/01/microsoft-navigation-Soundscape-app-blind-visual-impairment/

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https://techcrunch.com/2014/08/06/ibeacon-navigation/

https://www.theverge.com/2014/7/31/5956265/san-francisco-airport-testing-beacon-system-for-blind-travelers

http://www.simondogger.nl/emotionwhisperer.html

https://aira.io/

https://www.seeingwithsound.com/

Health diagnosis in everyday applications - Technological, Social

Another way how technology is being used to support vision loss prevention and rehabilitation is through diagnosis. Lenscrafters is “enabling doctors to conduct eye exams

directly from iPads. Instead of manually turning dials to gauge what images are more clear for patients doctors can run a digital refractor and change lenses directly off of the tablet. After the exams, doctors use the iPads to show and explain eye health images, simulations, and lens benefits" (Beaver & Aouad, 2018).

Other researchers are taking advantage of artificial intelligence to identify eye diseases like macular degeneration or diabetic retinopathy. Another example is Peekvision, which uses smartphones to identify people with vision problems and connect them to local healthcare providers.

Sources:

http://medicalfuturist.com/what-comes-after-the-wearable-health-revolution/

https://www.everydayhealth.com/vision/new-research-uses-artificial-intelligence-target-eye-disease/

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https://www.peekvision.org/

Smart homes/ Digital assistants & companies through voice recognition -

Technological, Social

Smart homes and virtual assistants is another trend which helps to create a "smart" environment. Today's virtual assistants like Alexa, Google assistant or Siri can give

information, acquire services and connect to different devices and IoT (Internet of things) giving more control over voice to people. Sensors embedded in-home devices can be able to identify, for example, emergency situations and make automated calls to emergency services. The developments in artificial intelligence will permit this virtual assistant and the devices to execute actions, predict needs and follow conversations more naturally.

Sources:

https://www.wgsn.com/blogs/future-ai-voice-recognition-screens-brands/

http://trendwatching.com/quarterly/2017-11/5-trends-2018/

https://www.investopedia.com/terms/s/smart-home.asp

Always connected - Technological, Social

Always-connected is almost a reality, Microsoft is launching a set of PCs that will be continuously connected to the internet through LTE wireless networks without the need of Wi-Fi. Added to this the implementation of 5G, the next generation of wireless systems will complement today's wireless technology with higher speeds. Another part of the always-connected trend is the increased use of smartphones, personal digital devices and digital wearables. These digital products are being used everyday and everywhere for social media interactions, buying products, manage finances or tracking personal health. The more these devices improve in performance, the more capabilities they will have to support accessibility and inclusion.

Sources:

https://www.digitaltrends.com/computing/microsoft-qualcomm-wireless-carriers-always-connected/

https://www.wgsn.com/blogs/china-look-worlds-most-connected-consumer/

https://www.digitaltrends.com/mobile/what-is-5g/

Accessible DIY/ Patient empowerment - Technological, Social, Economic

The current increase in accessibility to low cost do-it-yourself (DIY) technology, such as three-dimensional (3D) printing, smaller computers, electronic modules such as Raspberry Pi or Arduino, alongside the manifestation of multiple "how to do" sources are opening a door for people to develop and build solutions for their specific needs. From tools to learn new skills to the development of smartphone application like it was lego, this technology can open many possibilities for the visually impaired.

Sources:

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https://blog.hackster.io/a-raspberry-pi-vision-enhancement-platform-for-the-blind-8345295eb077

Automation of work - Technological, Social, Economic

According to McKinsey, around 5% of occupations can be entirely automated, but around 60% may see a third part of their task derived to machines. (http://www.bbc.com/future/story/20170522-how-automation-will-affect-you-the-experts-view) On another hand, countries like South Korea is introducing taxes on robots, fearing machines stealing jobs and income of human workers. These trends and emerging issues along with others like UBI may trigger an increase on the population with part-time jobs, and more time to either look for other works or income or invest their time in personal interests like volunteering.

Sources:

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https://www.fastcompany.com/40476285/robot-taxes-are-a-good-idea-as-long-as-the-end-goal-is-basic-income

https://www.mckinsey.com/global-themes/future-of-organizations-and-work/the-digital-future-of-work-what-will-automation-change

https://www.theguardian.com/us-news/2017/jun/26/jobs-future-automation-robots-skills-creative-health

https://hbr.org/2018/01/how-automation-will-change-work-purpose-and-meaning

Seniors with a voice - Values, Political, Social

Social media is playing a big role in the last years to diffuse important messages and actions for change social issues not yet addressed. The hashtags #metoo, #timesup, #neveragain have been part of a movement of change against sexual harassment, gender unbalance, and gun control. The high interconnectivity of devices plays a role too, making public and transparent many situations that in the past may have been kept hidden like the Uber CEO discussion and reactions with one of the company's driver. This video was a part of incidents that led to a change too; the CEO had to resign. Seniors are not strangers to social media anymore, the use of social media by seniors is spiking, and this may influence in having a louder voice against ageism, lack of services and segregation.

Sources:

https://www.wgsn.com/blogs/golden-globes-black-carpet/

https://www.bloomberg.com/news/articles/2017-02-28/in-video-uber-ceo-argues-with-driver-over-falling-fares

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https://www.ofcom.org.uk/about-ofcom/latest/features-and-news/rise-social-seniors

https://www.cnbc.com/2018/03/05/neveragain-gun-control-debate-pits-nra-against-kids-on-twitter.html

http://trendwatching.com/quarterly/2017-11/5-trends-2018/

Smart cities / Private neighbourhoods - Values, Political, Social, Economic

Smart cities can be considered those who "use information and communication technologies (ICT) to be more intelligent and efficient in the use of resources." https://www.fastcodesign.com/1679127/the-top-10-smart-cities-on-the-planet Their power is based on gathering data from different source to understand how to react or what to do. There is already a project from Google's Sidewalk labs, to transform part of the Toronto's waterfront area into a smart neighbourhood. However, there is no clarity about the implications of this development, how accessible and inclusive the area will remain, who is going to own or have the right on the land intervened, how data privacy will be managed. In the last years, we have seen the emergence of other cities considered smart like Singapore or Tokyo, and neighbourhood developments managed by private corporations in Asian cities like Manila and Hanoi.

Sources:

https://www.thestar.com/opinion/contributors/2018/01/31/the-controversy-over-googles-futuristic-plans-for-toronto.html

https://www.forbes.com/sites/chynes/2017/11/10/singapore-ranks-as-one-of-the-top-smart-cities-in-the-world/#60d1fa4b717d

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Accessibility, Inclusiveness and Disabilities Awareness - Values, Political, Technological, Social

Accessibility along with inclusiveness is changing the way people and organizations are facing product development and service delivery. From governmental legislations like the AODA regulation to transform the Ontario province into an accessible region, to development of services targeted to visually impaired people like the Audio MakeUp courses with voice instructions, we have seen different emerging events supporting accessibility, inclusiveness and awareness of disabilities. There are other initiatives worth to mention which may influence future developments for seniors with vision loss like the AirBnB inclusive design toolkit which through questions is helping designers to check their biases or the increase in availability of audio-described content in diverse platforms like Netflix, iTunes or Amazon prime movies.

Sources:

https://www.ontario.ca/page/charting-path-forward-report-independent-review-accessibility-ontarians-disabilities-act#section-2

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Role of Seniors in society / Ageism / Social inclusion - Values, Political, Technological

Although technology and certain movements are supporting the inclusion of seniors in society, and the longer life expectancy and better health in later years are keeping them in a more active role we can see also that there is still ageism and a lack of inclusion in the current environment. Sharon Butala, in a Walrus article transmits "Everyone around me either ignores old people or treats this demographic as a problem to be solved—thinking in terms of pensions and income levels, healthcare and housing needs, and, recently, loneliness—rather than as a resource from which the benefits of thoughtful, experience-based advice might flow." (https://thewalrus.ca/against-ageism/) There is a perceived breach into how seniors and younger people experiment and interact with the world, and

this has been increasing since faster is always considered better for the economic development versus the slower approach of seniors into their experience of life.

Sources:

https://thewalrus.ca/against-ageism/

http://www.ohrc.on.ca/en/ageism-and-age-discrimination-fact-sheet

Changes in living situations - Values, Social

The typical family structure of mother father and kids and seniors care homes has been changing in the last decades opening to new living situations, there is an increase in adults living by themselves, more older adults living alone supported by technology. Added to this, the All Families Are Equal Act recognizes “the legal rights of up to four co-parents, regardless of their sexual orientation or how the child was conceived”. And on the other side the increments on immigration also brings different structures of living and family situations where seniors may have a more active role in bigger family settings. Other approaches we can see mainly in Europe is the intergenerational living environments where young students are living with seniors and offer them support in exchange of reduced rent.

Sources:

https://torontolife.com/city/life/platonic-co-parenting-new-modern-family/

http://onlinelibrary.wiley.com/doi/10.1111/j.1741-6612.2005.00065.x/full

http://onlinelibrary.wiley.com/doi/10.1111/j.1741-6612.2005.00065.x/epdf

https://www.matherlifewaysinstituteonaging.com/2014/11/05/apartments-life-dutch-senior-housing-innovation/

https://internationalsocialhousing.org/2017/05/29/learning-best-practices-in-housing-for-the-elderly-from-the-dutch/

http://www.cbc.ca/2017/attention-canadian-singles-why-not-raise-a-child-with-your-best-friend-1.4097066

Increased tailored activities for senior population - Values, Social

The increase of the percentage of the senior population has influenced the development of different offerings targeted to them; we can find a wide range of meetups (local gatherings around a common interest) topics for seniors, or social and recreational programs organized by different community centres from education to lawn bowling the variety is broad.

Sources:

https://www.meetup.com/topics/seniors/ca/on/toronto/

http://trendwatching.com/quarterly/2017-11/5-trends-2018/

http://www.torontocentralhealthline.ca/listServices.aspx?id=10175