THE FUTURE IS SHARP

SYSTEMIC HEALTHCARE ANALYSIS REDESIGN PLAN

WHY VANCOUVER'S HEALTHCARE SYSTEM WON'T SAVE US AND WHAT WE SHOULD DO ABOUT IT

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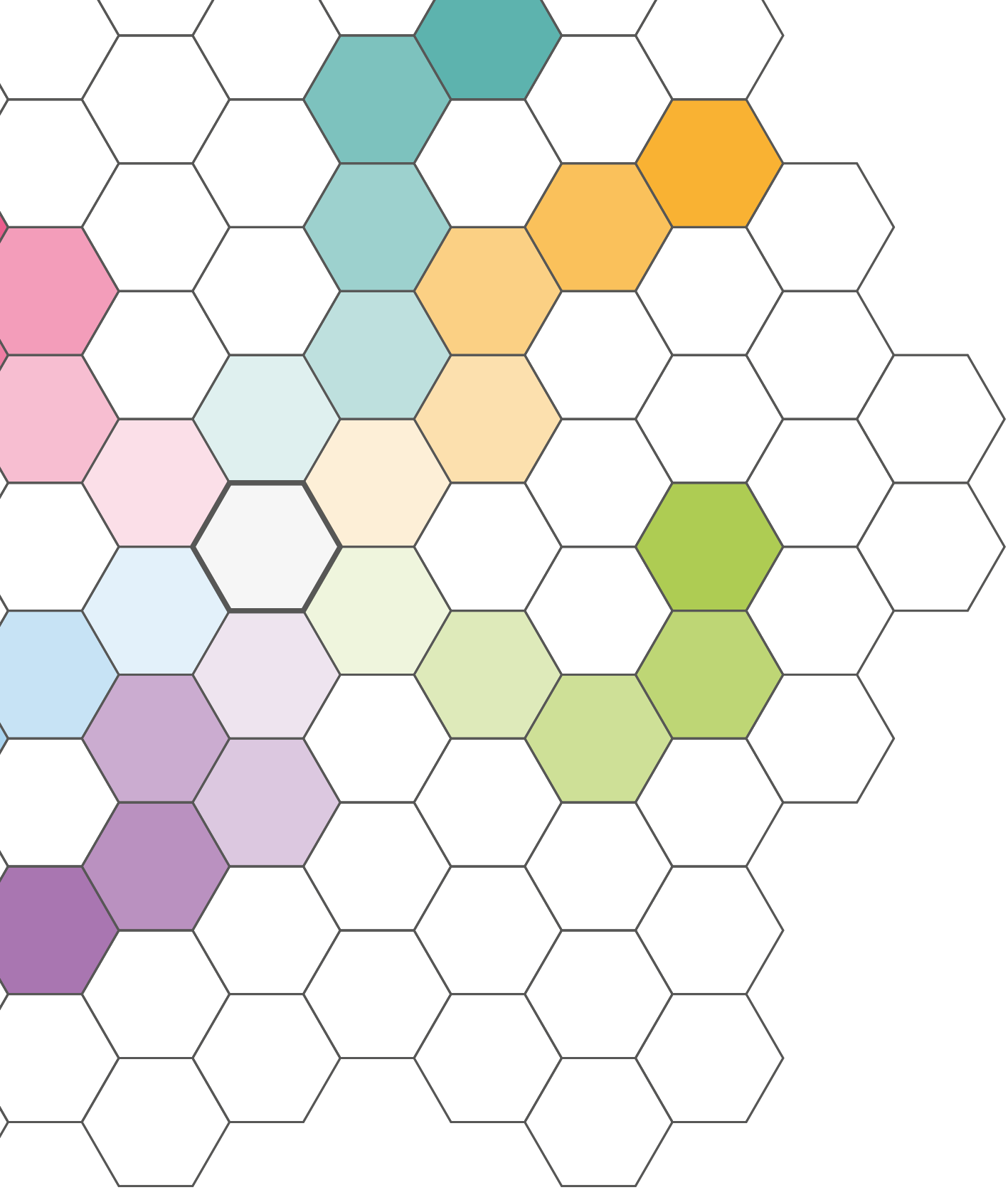

DESIGN CONTEXT:
Healthcare System Design

Using **Systems Thinking** to Analyze and Re-design The **Healthcare System** of **Metro Vancouver**

WILSON SCHOOL OF DESIGN KPU

A design research project for
DEPD 2410: Studio 3
Professors: I. Karaush & V. Martínez
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Unfolding the Project

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1
INTRODUCTION

Project Overview

Systemic Change of the Healthcare System

Systems thinking is an important component of the design field that looks at the complexity of a diverse group of entities and how they are all interrelated to form an "ecosystem." Each entity is connected to the others through the direct flow of resources or indirectly via an intricate web of relationships. One change within a system impacts every other entity in some way, meaning that it is challenging to predict the outcome of intervening in the system.

Using proven methods and a defined process, the students of Kwantlen Polytechnic University's product design program are introduced to systems thinking in the second year of their education journey. This project explored one of the five main systems in the Metro Vancouver area, with the focus of this report being the healthcare system. The culmination of a semester-long study of healthcare systems, the booklet outlines the steps taken to understand the local challenges and suggests several improvements of different complexity to better serve the community and the system itself.

2
INSPIRATION

United Nations Sustainable Development Goals

Conceived and published in 2012 by the United Nations (UN), the Sustainable Development Goals (SDGs) serve as a direction for the global community to help guide behaviour and decisions heading into an uncertain future.

WHAT'S BEING DONE GLOBALLY?

Taking a Leaf out of the United Nations Book

From the 17 Sustainable Development Goals, we began by studying the most relevant to our project on the healthcare system: SDG 3 - Good health and wellbeing. In reading the United Nations and World Health Organization (WHO) websites, we formed a better understanding of the different challenges around the world.

Figure 1:
How SDG 3 relates to the other 16 goals

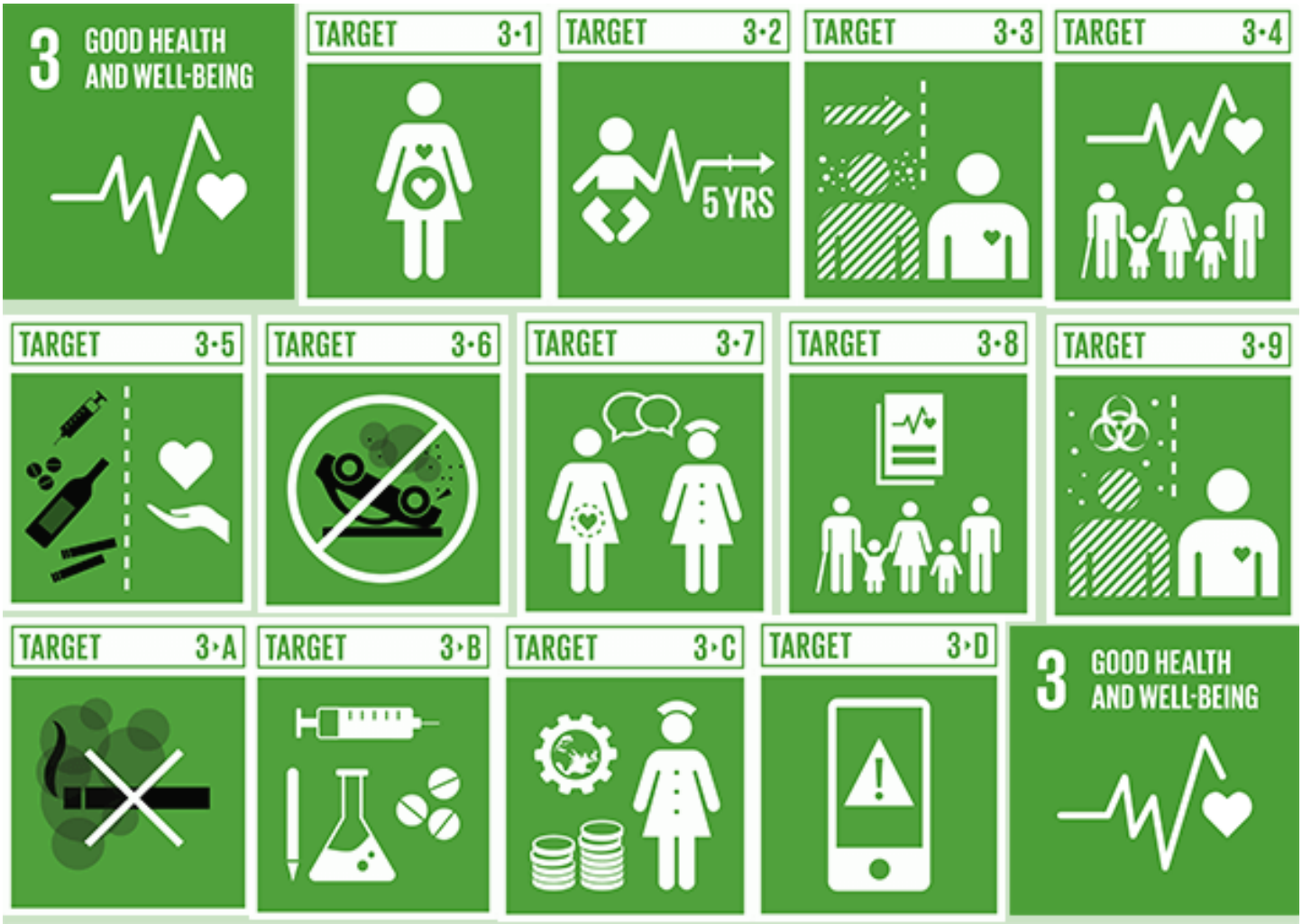
> The UN SDGs are a series of interconnected goals, with any solution to one goal causing ripple effects in other areas. We looked at the above diagram to see how the WHO identified the overlap between SDG 3 and the other 16 the goals.

MAKING PROGRESS

SDG Targets and Indicators

Each SDG has its own targets with respect to specific areas that need addressing around the world. Every country should aim to improve in these target areas from an existing baseline. For each target, there are one or more indicators that help a group to identify how they are achieving in this particular area.

Figure 2:
The targets of SDG 3



By reading the targets and indicators for SDG 3, it became evident that they are focused on very specific metrics; therefore, it is difficult to make an impact using a systems design approach. SInce these metrics are based on outcomes, we began to research the causes and reasons these targets exist and how they apply to Canada.

We created a roadmap for the current targets and indicators of SDG 3. This helped us to identify areas to improve upon, and also gave us a starting point for understanding the short term and potential long term goals of SDG 3.

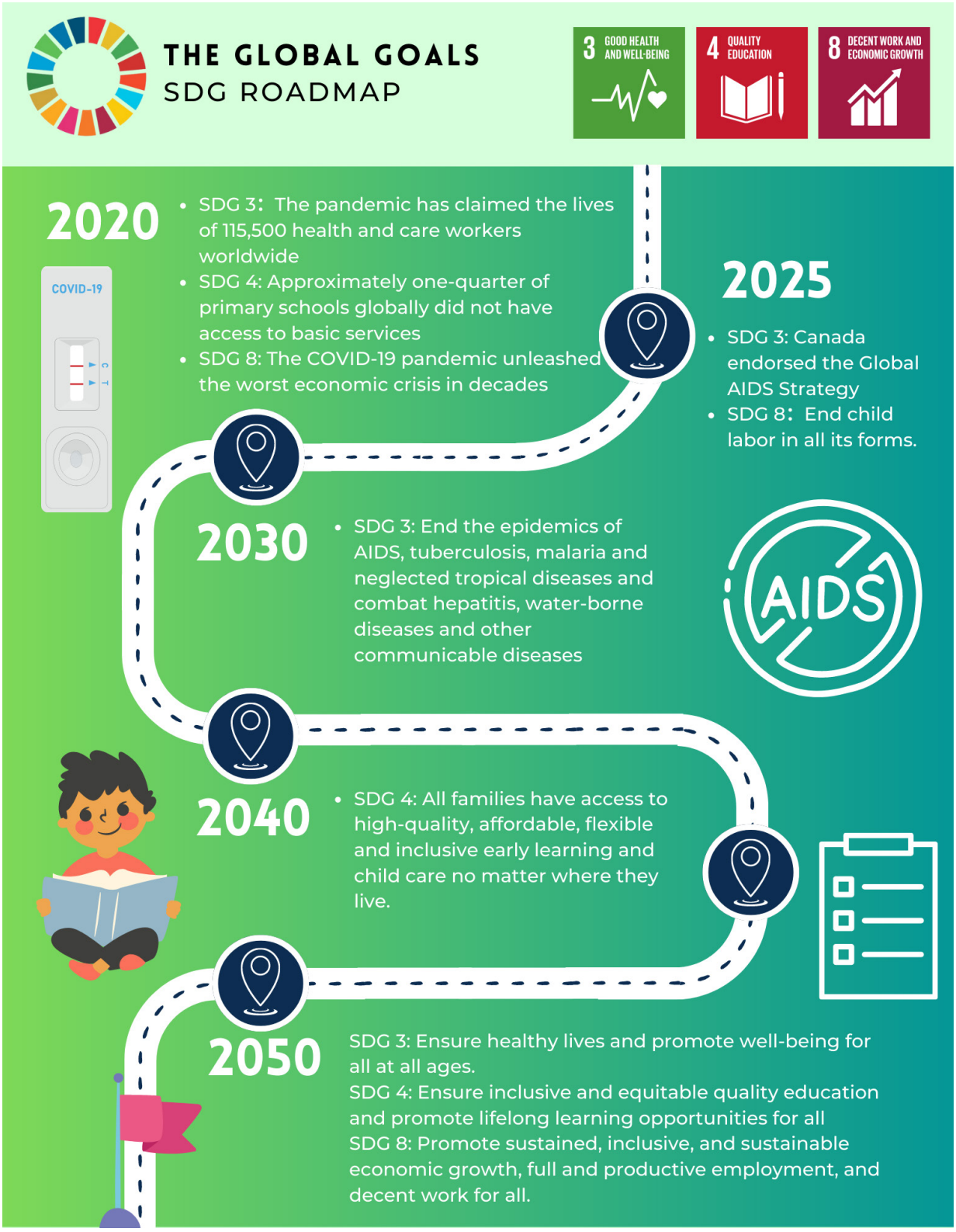


Figure 3:
The Roadmap for SDG 3

3
IDENTIFICATION

Research and Gathering Insights

Throughout the project, research was the key activity in helping our team to make sense of a complex and often divisive topic for Canadians, and allowed us to form a better understanding of the many entities and institutions involved in the healthcare system.

WHERE DOES THE MONEY GO?

A Look at Canada's Healthcare Funding

Our first port of call was understanding how funding works through the provincial system (figure 4). This helped us understand the flow of money through the BC provincial and federal governments.

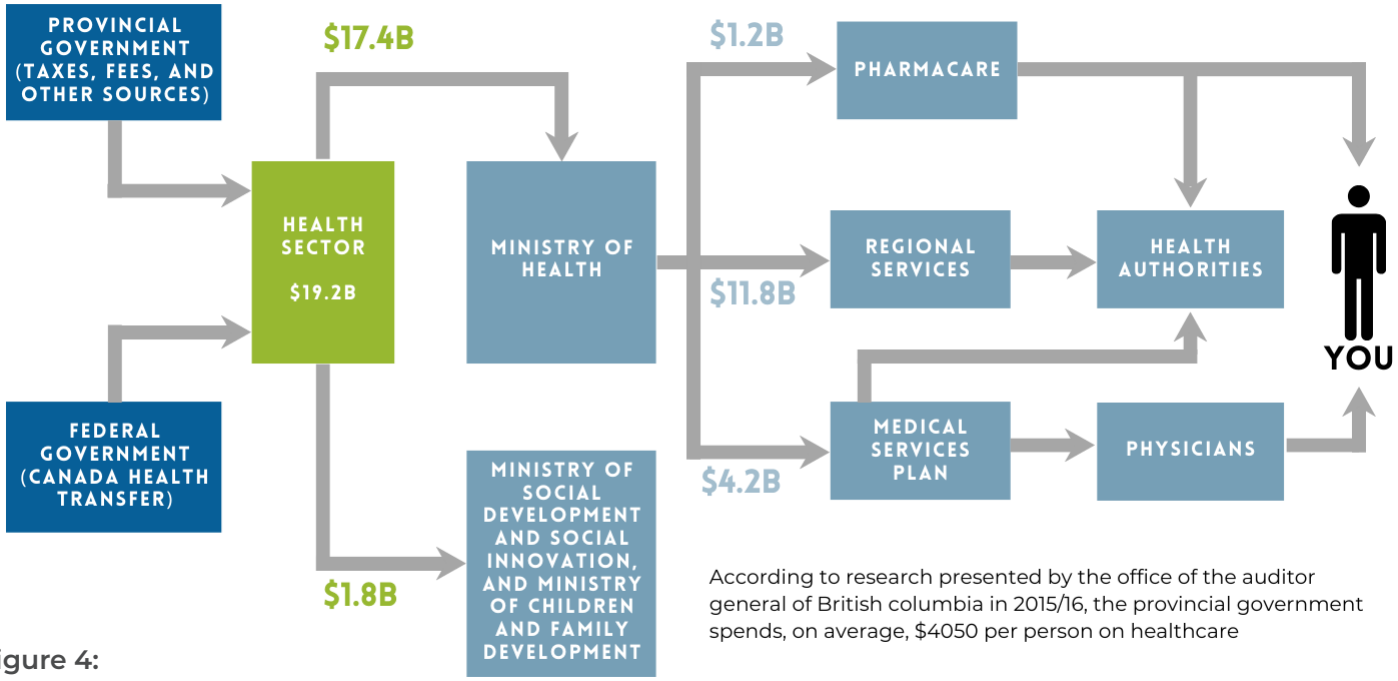


Figure 4:
Canada's Funding Model

Canada also spends more on healthcare than other OECD (Organisation for Economic Co-operation and Development) member countries that are outperforming Canada in their healthcare systems.

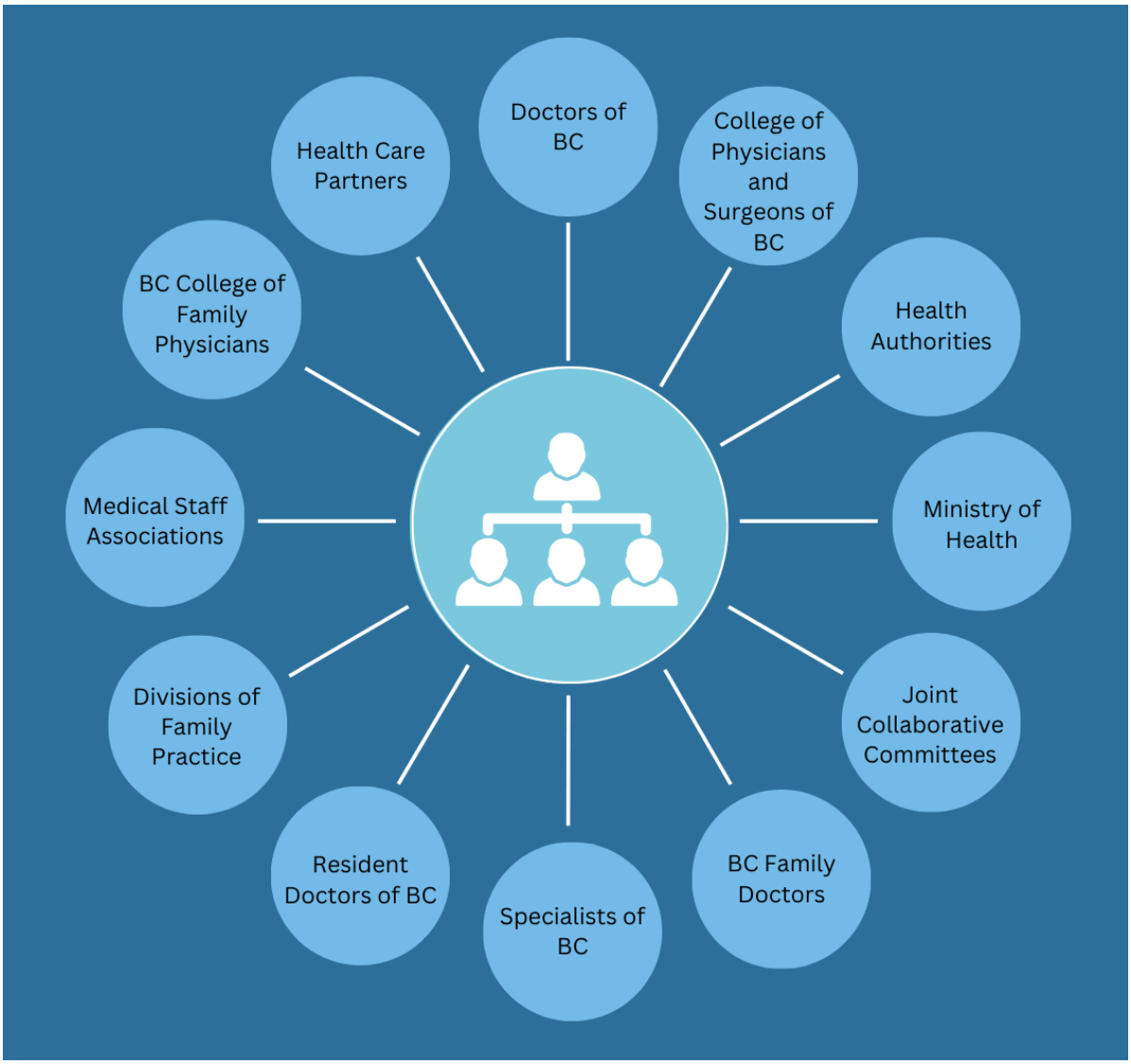
Figure 5:
Comparing Canada's Healthcare Spending to other OECD countires

WHO'S INVOLVED?

Understanding the Different Players in BC's Healthcare System

In order to understand a complex problem, we must understand who exactly is involved. There are different groups of people, who are involved in the current healthcare system to very different extents. One group may be involved provincially (for example, specialist governing bodies in BC) while other groups are involved on a much wider level (for example, international health authorities such as WHO).

Figure 6:
Understanding The Different Healthcare Organizations in BC



HOW ARE WE REALLY DOING?

Comparing Canada to Other Countries

They say that comparison is the thief of joy, and unfortunately we found this to be true. When comparing Canada to other similar developed countries with universal healthcare, we found that Canada has fallen seriously behind.

	CANADA	AUSTRALIA	GERMANY	SWITZERLAND
HEALTH-CARE SPENDING (as a share of the economy)	**1ST** /30	**7TH** /30	**6TH** /30	**4TH** /30
DOCTORS (per 1000 people)	**28TH** /30	**9TH** /30	**12TH** /30	**7TH** /30
HOSPITAL BEDS for physical care (per 1000 people)	**23RD** /28	**11TH** /28	**3RD** /28	**12TH** /28
SPECIALIST WAIT (less than 4 weeks)	**10TH** /10	**5TH** /10	**3RD** /10	**2ND** /10

Figure 7:
Comparing Performance of Universal Health Care Countries 2022

A TICKING CLOCK

Why Canada's Aging Population is a Much Bigger Issue than We Realized

What would happen if Canada's aging population greatly outnumbered its working population? What would happen if there was no infrastructure to support this scenario? What if we told you that's exactly what's going to happen...

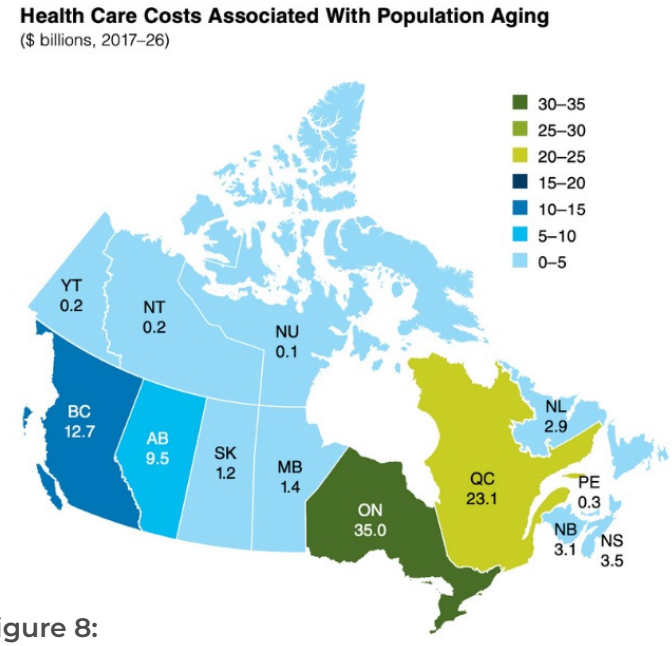


Figure 8:
Healthcare Costs Associated With Population Aging in Canada's Provences

As a country, Canada's population is aging, and will continue to do so in the future. An aging population is associated with increased healthcare costs, and each province in Canada is set to see an increase. While population aging will be most intense in Eastern provinces, BC will see an increase of $12.7 billion by 2026 due to healthcare costs related to the aging population.

Understanding WHY healthcare costs will increase over the next few years is essential, and the aging population will account for 1.0% of 5.1% of growth per year (Figure 9).

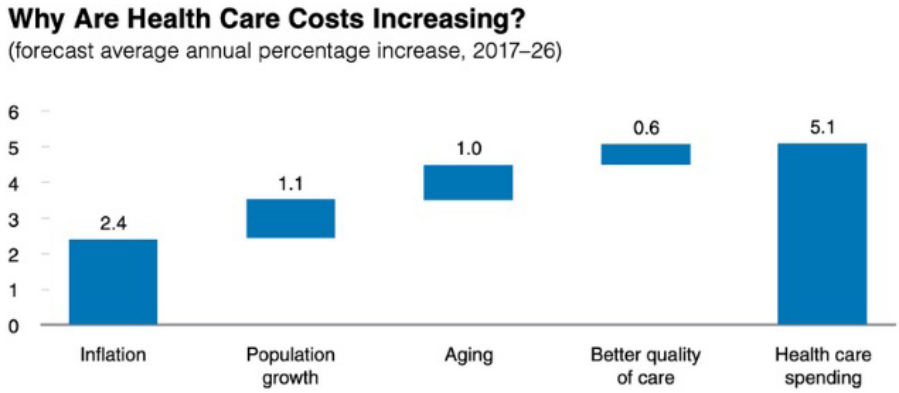


Figure 9:
Breakdown of Increasing Healthcare Costs in Canada

SURELY IT'S NOT THAT BAD...

Taking a Closer Look at the Shocking Figures

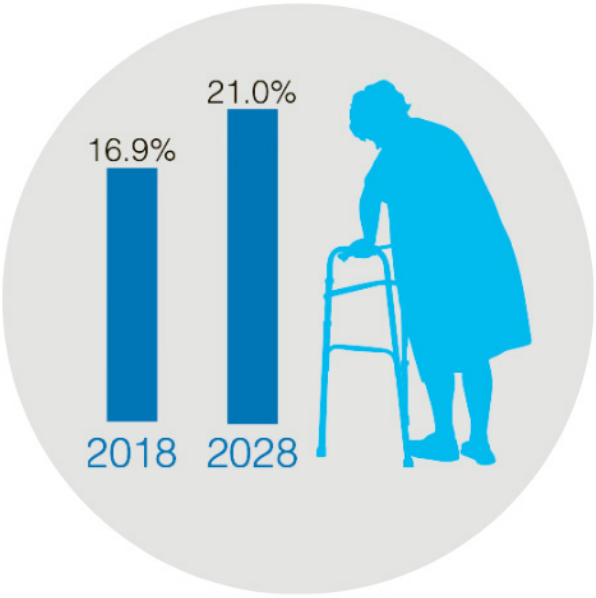


Figure 10:
The proportion of seniors in Canada's population will rise from 16.9% to 21.0% in the next 10 years.

Figure 11:
Over the next 10 years population aging will add $93 billion to healthcare costs (which is roughly equal to 1.8% of all provincial and territorial spending.)

Figure 12:
Federal health transfers to the provinces and territories do not currently account for population aging. With no further action, the federal share of health care funding will fall below 20% by 2026.

Figure 13:
The cost of healthcare for the average senior is about $12,000 per year, compared with $2,700 per person for the rest of the population.

WHAT DO THE EXPERTS SAY?

Asking the People Who Are on the Frontlines

One of the best ways to test whether you are on the right track with your research is to talk to the people who have first-hand experience in the field. As part of our quest to understand the issues of Metro Vancouver's healthcare system, we conducted nine interviews with people who are part of the healthcare system (either as people who have worked in the system, or who have been a part of it as patients). The following figures are excerpts from some of the interviews.

ICU NURSE

Q: What do you think will be the largest challenge facing BC's healthcare system in the next 10 years?

A: Maintaining adequate staffing as the "boomer" generation retires and becomes older/starts accessing the healthcare system. This is already a strain now and it will only become worse in the next 10 years. There should be a much bigger investment in elder care than there is now.

PLASTIC SURGEON

Q: What are the biggest challenges within the healthcare system from your perspective?

A: Efficiency - bloated administration makes decision making slow. Affordability. Adaptability - incorporating new technology, equipment and procedures is really slow.

Figure 14:
Interview Results

OCCUPATIONAL THERAPIST

Q: What do you think are the most important changes that must be made to BC's healthcare system (in order to solve some of its problems)?

A: Increasing flexibility in funding models to provide individuals with the services that they need, placing funding where it will be most effective for health and wellness. Looking at community care, how can we come together as a community to care for one another in a more supportive way?

ICU NURSE

Q: What are the biggest challenges within the healthcare system from your perspective?

A: Our population is changing and our healthcare system can't keep up. Our cities are growing in number and our hospitals aren't equip to take care of a larger population. And as a population we are living for longer but living to be less independent which means long term care facilities are in more demand and people are waiting for beds there in the hospital for longer than they should be.

Figure 15:
Interview Results

BLISSFULLY UNAWARE?

What Does the Public Believe?

In order to drive massive change, there must be massive pressure from society. However, there can only be pressure if the public is well informed on what the current issues of their healthcare system are.

Out of the list below, what do you think will be the largest challenge facing BC's healthcare system in the next 10 years?

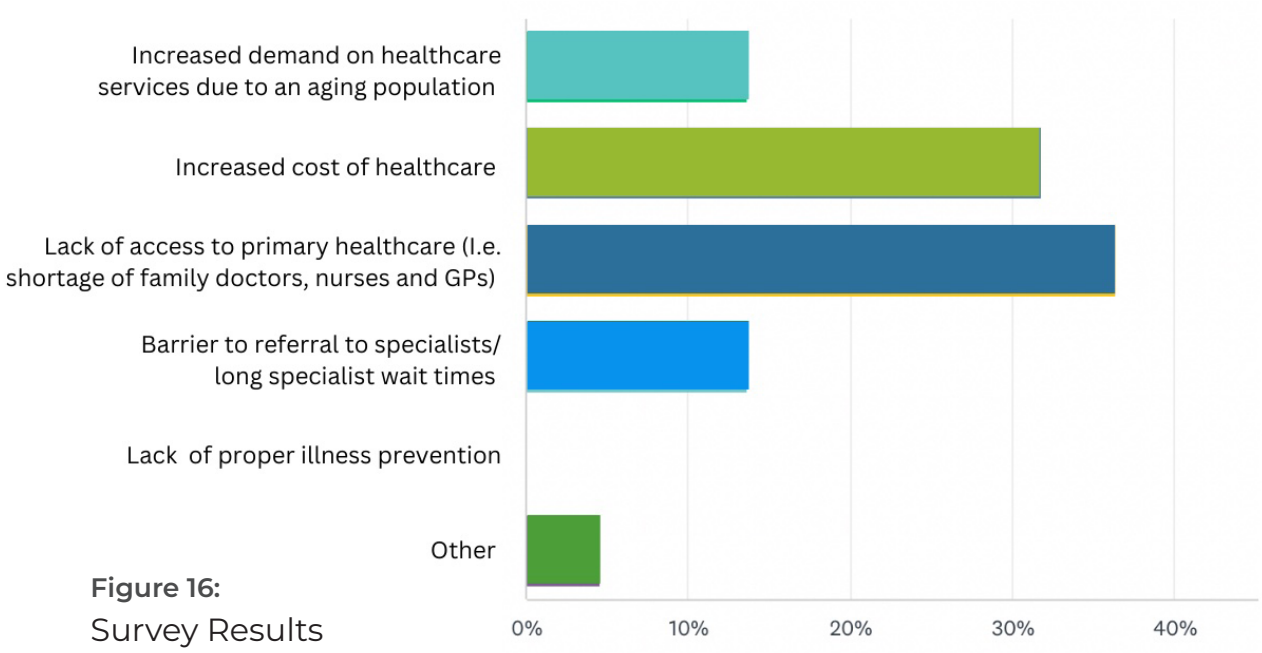


Figure 16:
Survey Results

We conducted a survey using SurveyMonkey, and got over 20 responses from the general public. We asked people what they believed would be the largest challenge facing BC's healthcare system in the next 10 years. Most people (36%) believed it would be a lack of access to primary healthcare. The second highest belief (31%) was the increase of cost of healthcare.
Only 14% of responses flagged an aging population as the largest iss-

WHAT DO THE PEOPLE WANT?

Asking People What They Want out of Their Healthcare System

How better to know what to design than by asking people what they need?

Figure 17:
Survey Results

4
EXPLORATION

Introduction to Systems Thinking

After being introduced to the project, we needed to collaborate as a team and make sense of what we knew (and thought we knew) with respect to the Metro Vancouver healthcare system and record our experiences and biases in a structured manner.

SUBCONSCIOUS BIAS

Becoming Aware of our Assumptions

The first stage of understanding the system in question is to identify as many connections between our thoughts as possible. This helps develop a sense of the complexity of the interactions and generate an initial map of knowledge.

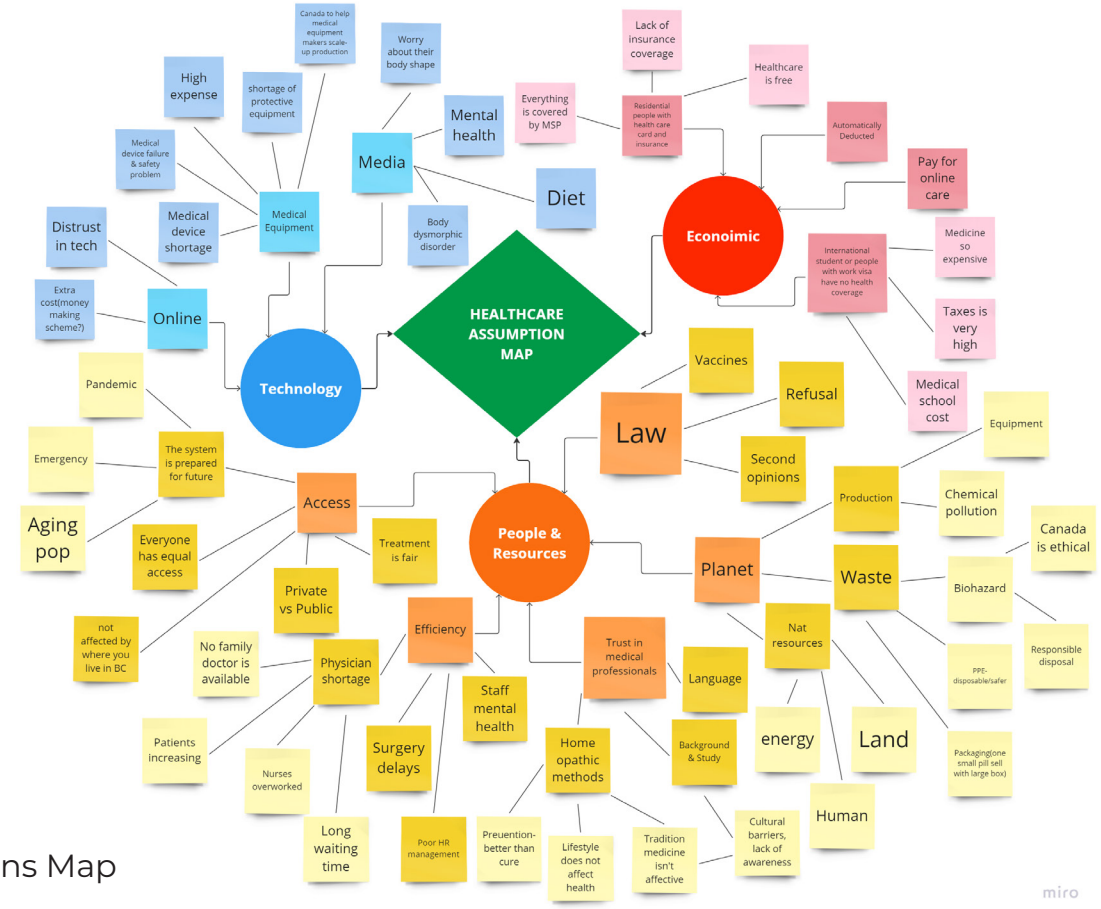


Figure 18:
Assumptions Map

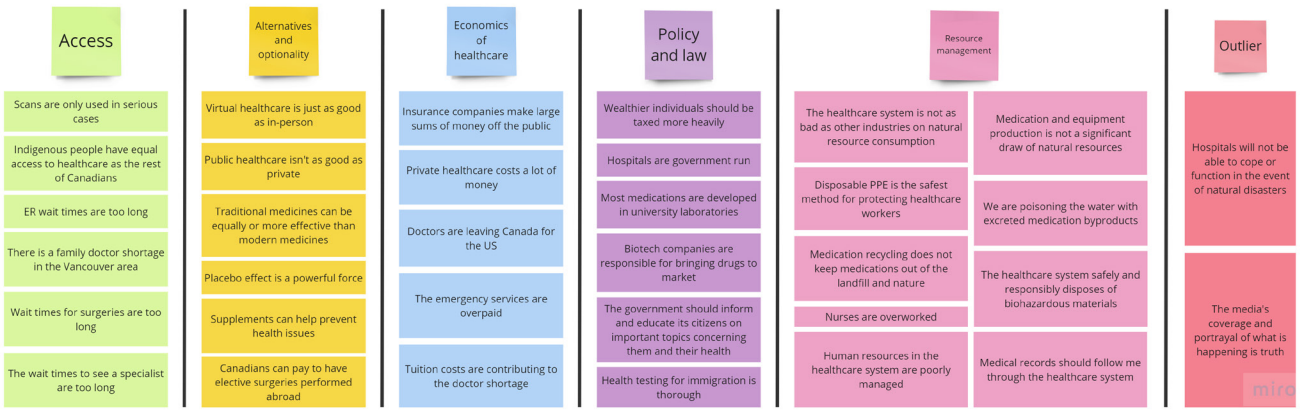


Figure 19: Affinity Diagram to Organize Early Assumptions

INTRICATE WEB

A Spider Diagram of Assumptions

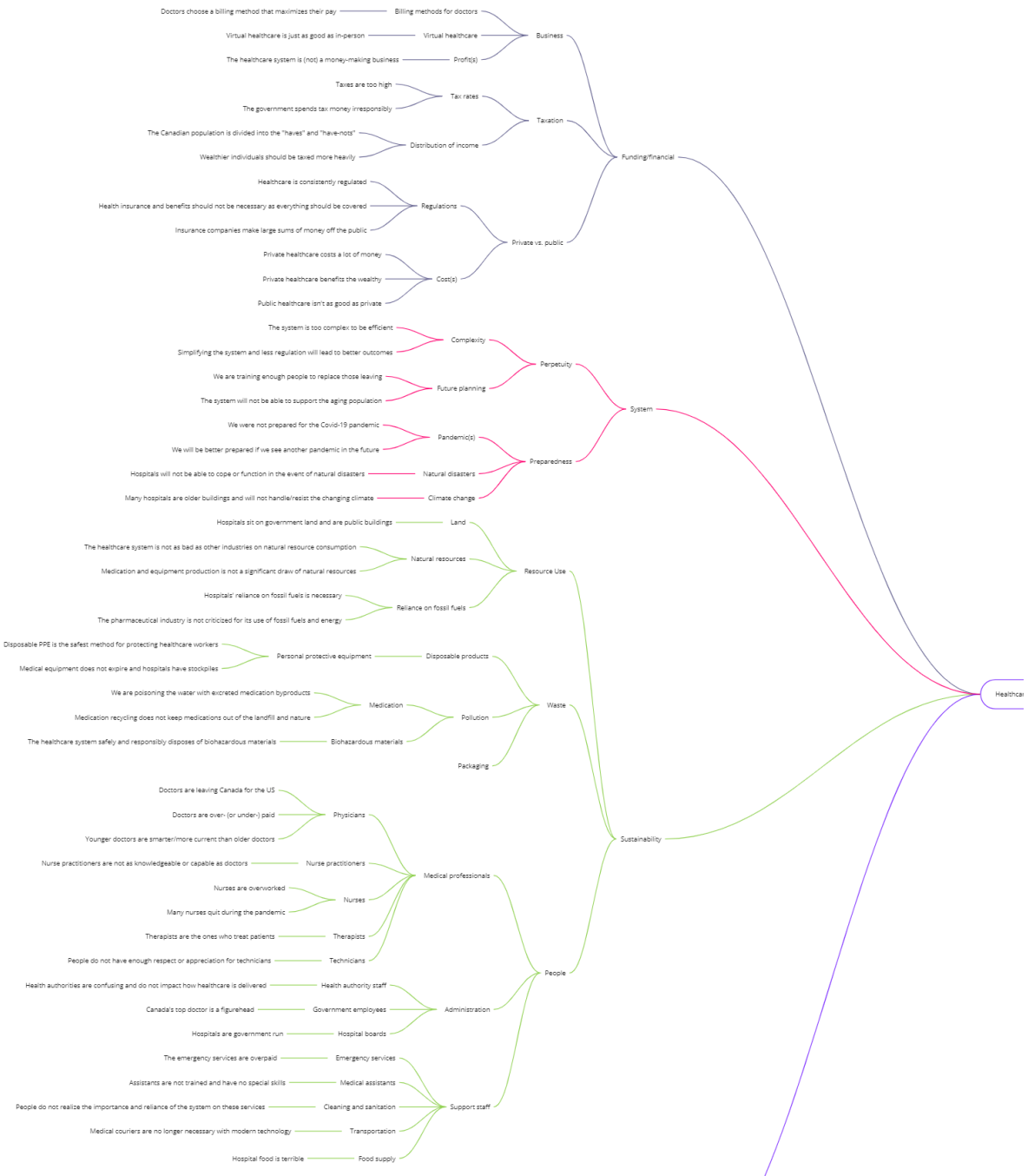
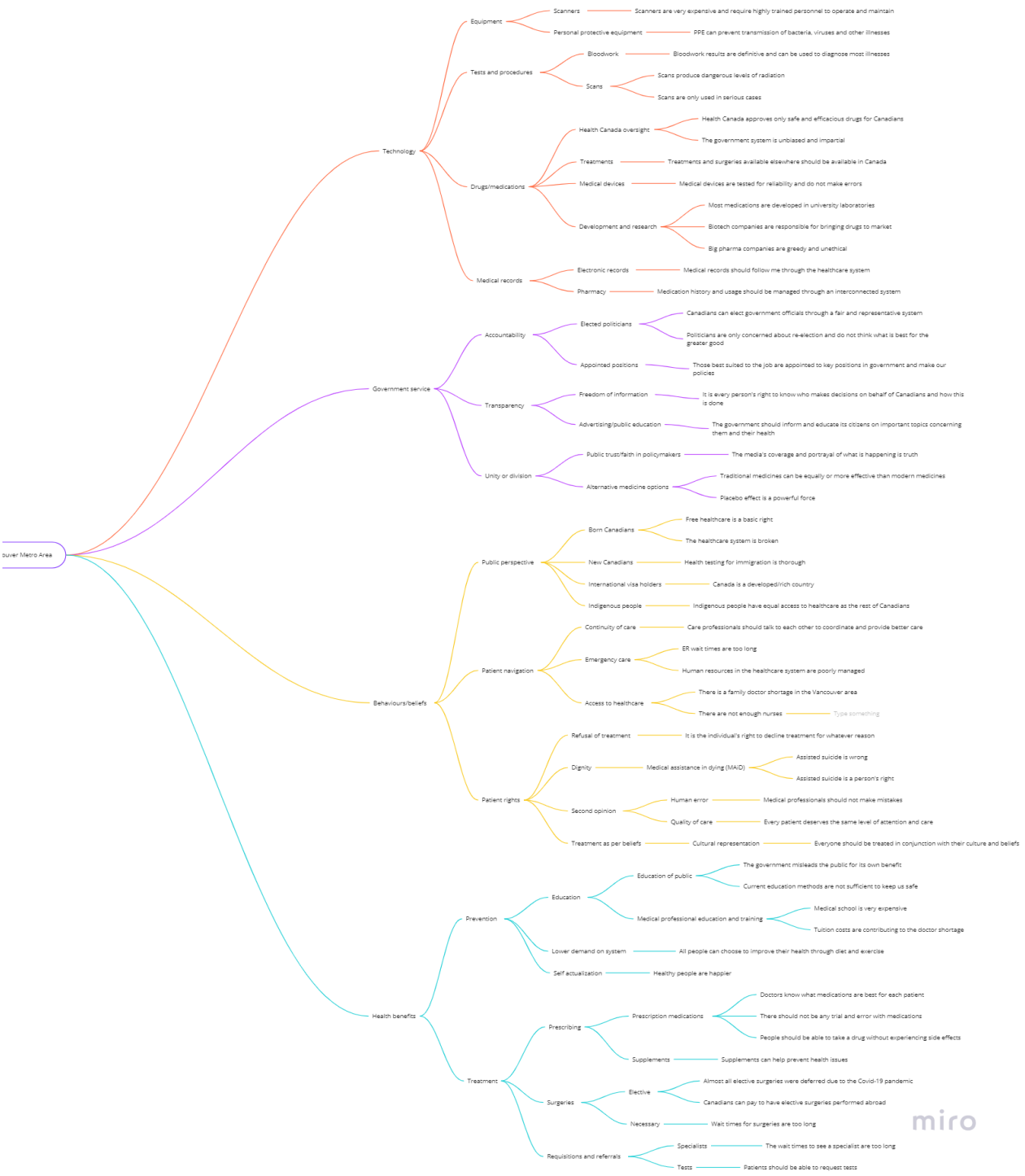


Figure 20: Spider Diagram of Assumptions

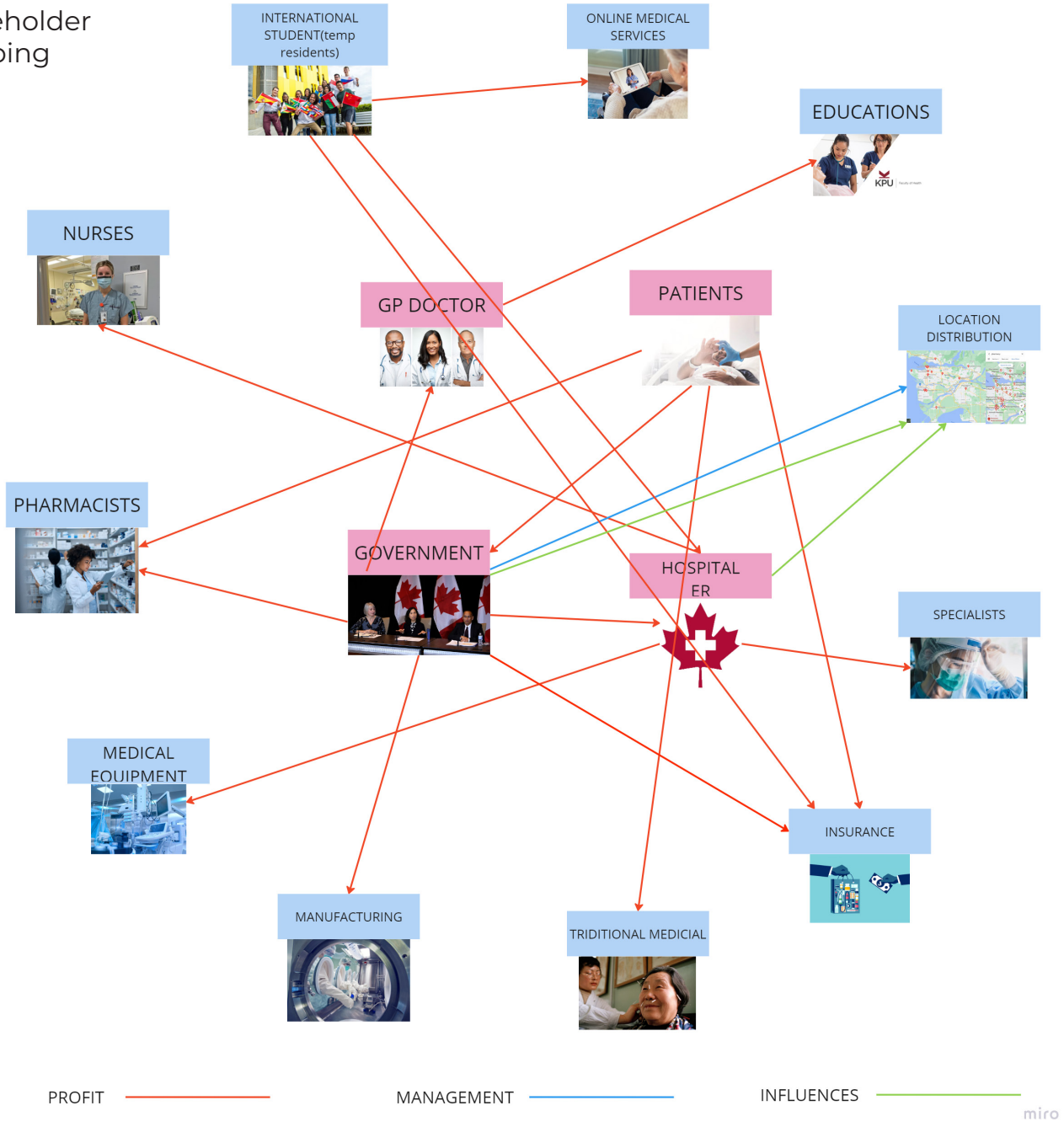


FINDING CONNECTIONS

Steakholder Connections and Resource Flow

Naming the key stakeholders and tracing the flow of different resources reveals an intertwined set of relationships between entities in the system. This process illustrates the branches of the network and where there is potential to intervene.

Figure 21:
Stakeholder Mapping



> A system is "a group of things that regularly **interacts** and which are **interdependent**, among them forming a unified entity"
>
> - Victor Martinez

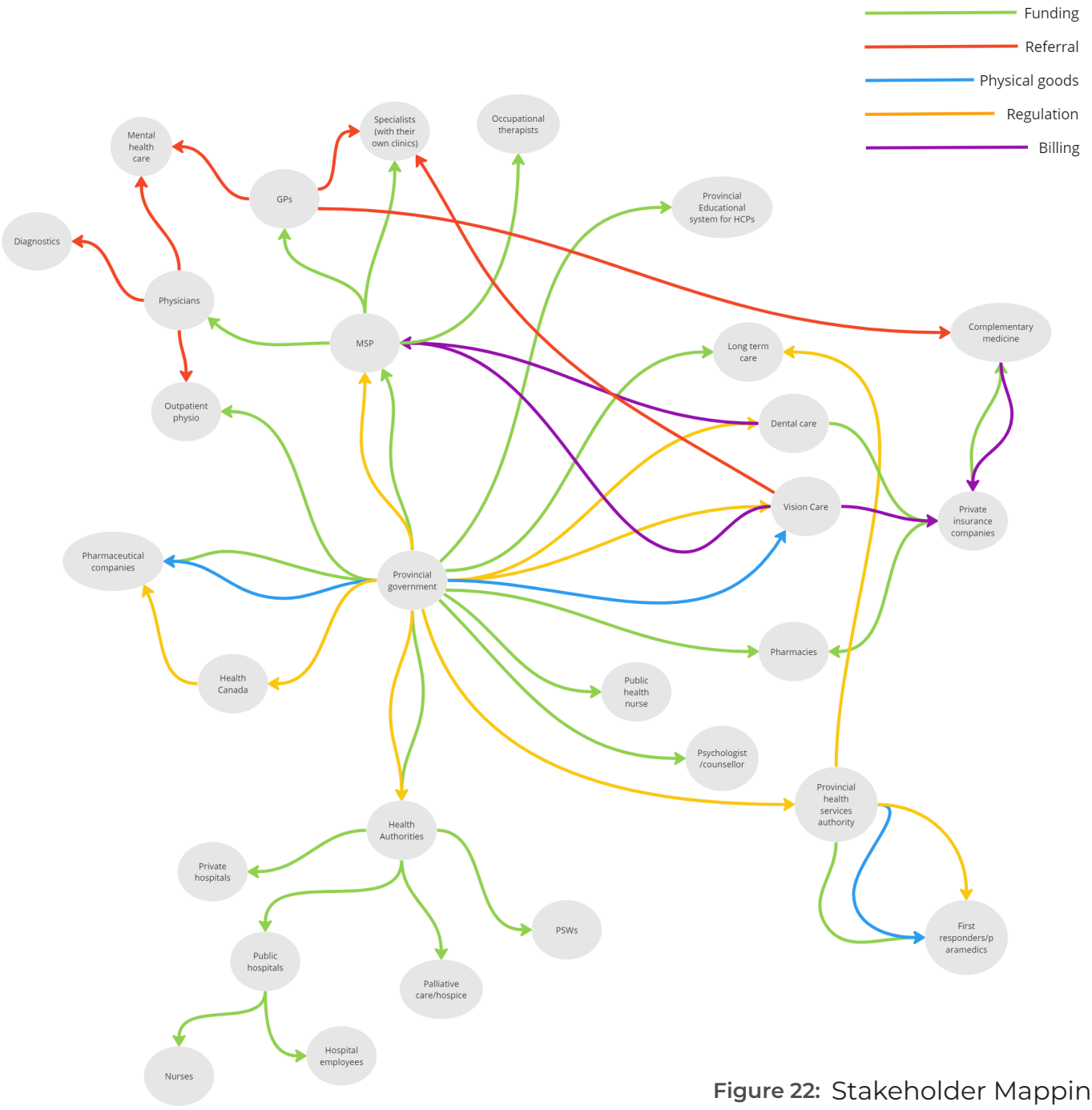


Figure 22: Stakeholder Mapping

5
DEFINITION

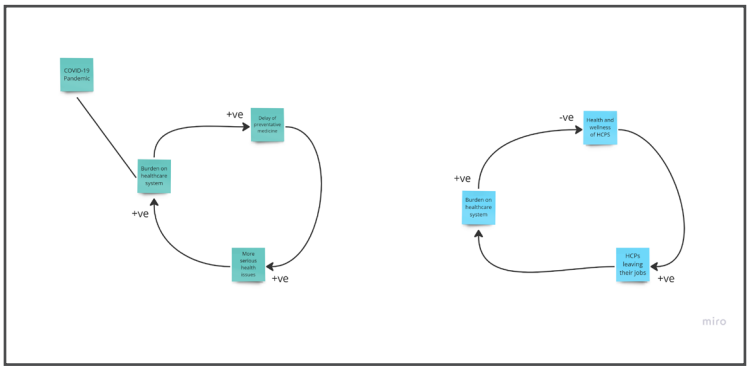
Problem Identification

Through research, the team began to appreciate the strengths and weaknesses of the Canadian universal health-care program (Medicare) and arrive at conclusions regarding the pain points of the overarching system.

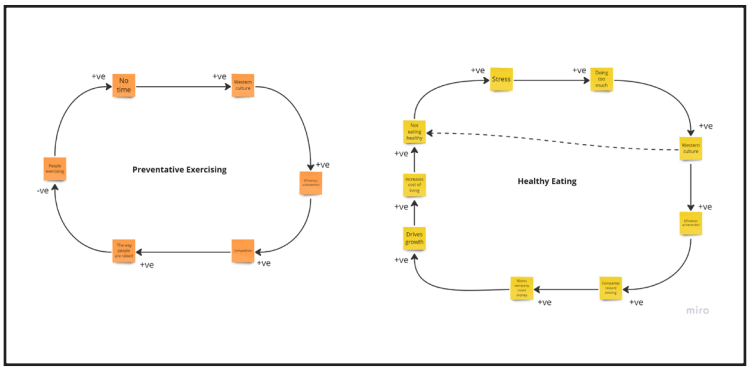
HOW TO BREAK THE CYCLE:

Identify its Feedback Loops

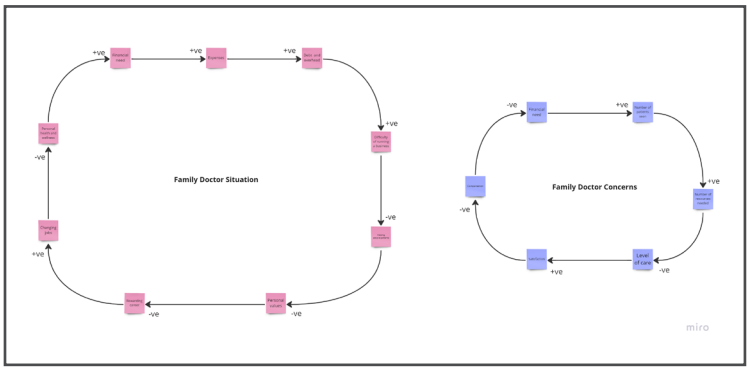
Figure 23:
Feedback Loops Showing the Compounding Issues in Canada's Healthcare System



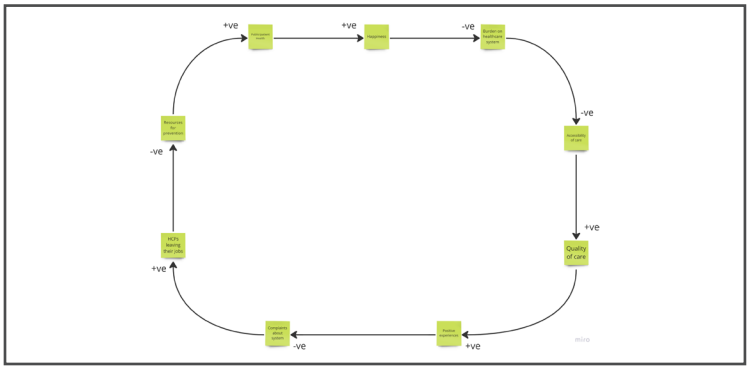
The burden on the healthcare system leads to poorer outcomes for patients and increases stress on healthcare professionals and infrastructure



Western culture has created a perpetual cycle of unhealthy habits, which is leading to worse health and an increase in disease (both chronic and acute)



Family doctors are entrepreneurs with significant demands on their time and who must balance patient care with business sustainability

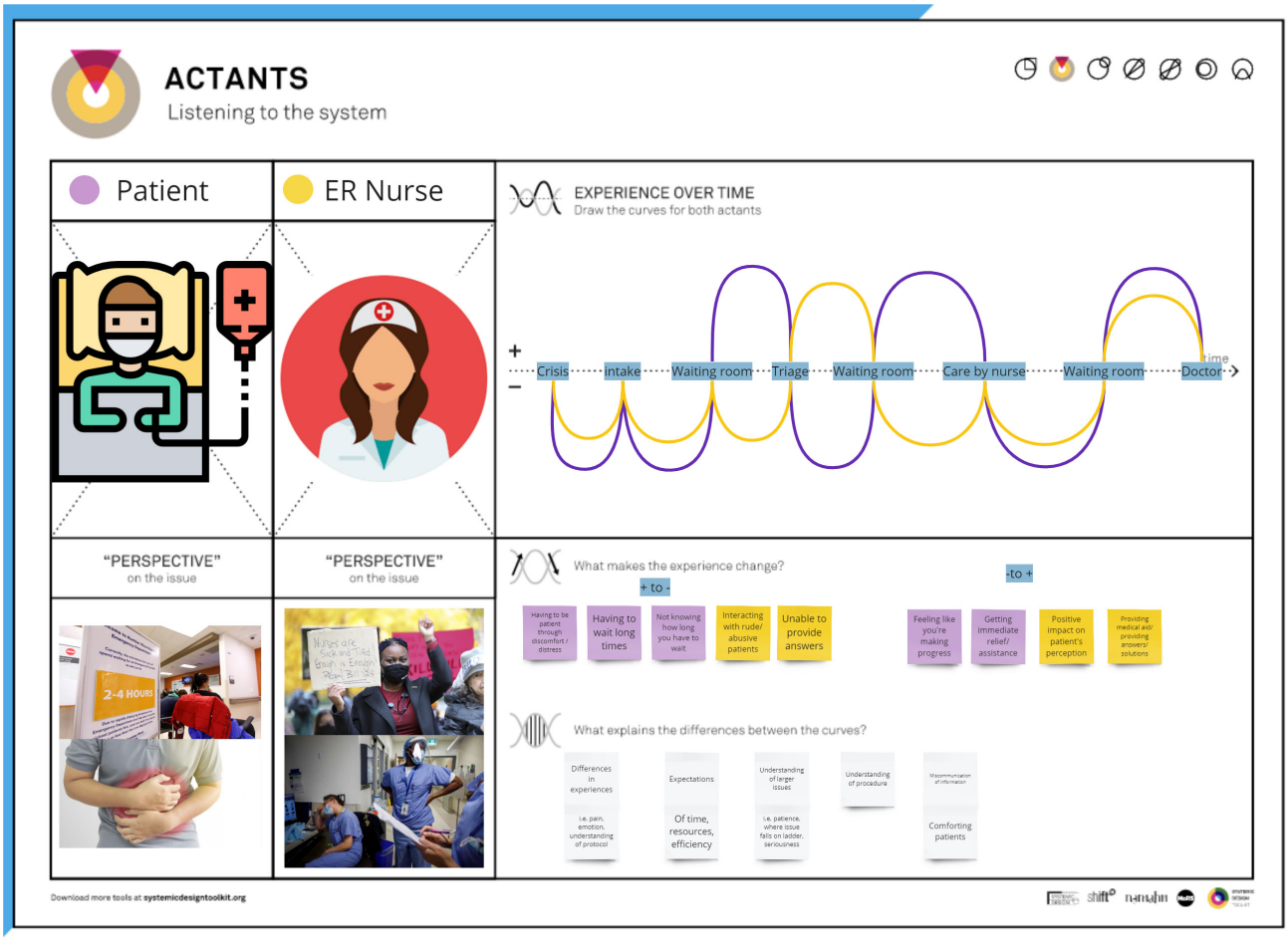


Goals and the priorities of the healthcare system are in conflict, with indicators revealing an overworked and undersupported network of workers

YOUR EXPERIENCE MATTERS

How Emotional Journeys Impact Healthcare Workers

Figure 24: The Emotional Impacts of Visiting the Emergency Room for Patients and ER Nurses

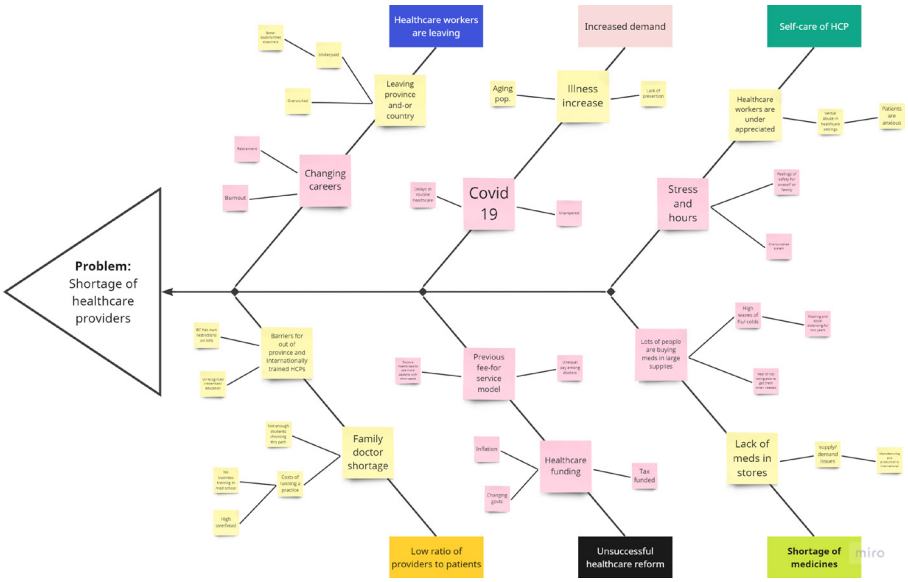


Healthcare workers have the challenging job of treating patients in duress, managing the resources of the hospital and healthcare system, while juggling individual responsibilities and meeting expectations from everyone. This takes a toll on their mental health.

PROBLEMS ON PROBLEMS...

Looking at the Causes Behind the Issues

Figure 25: Fishbone Diagrams Illustrate the Problems' Problems



Exploration of the underlying causes of the many identified problems in the current Metro Vancouver healthcare system through branching, connected ideas from the backbone of the issue.

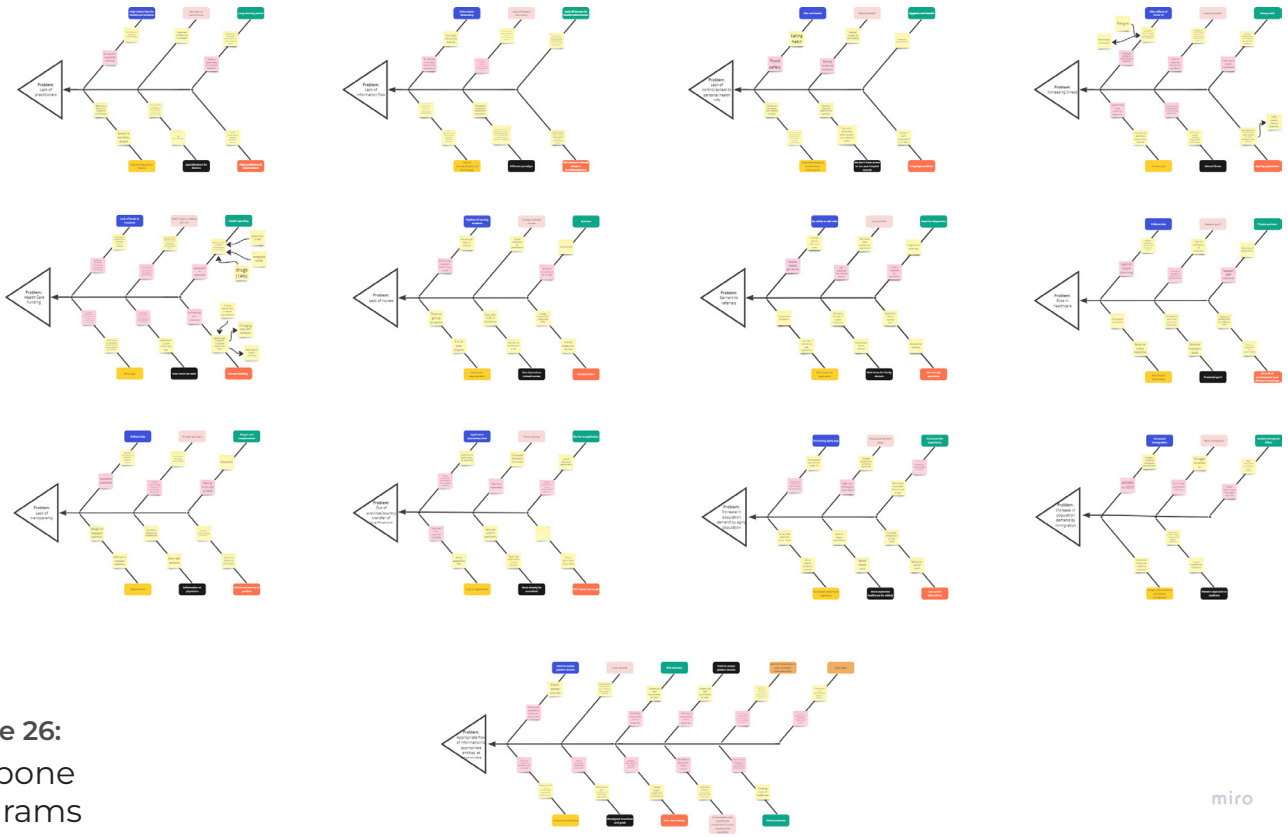


Figure 26:
Fishbone Diagrams

JUST THE TIP OF THE ICEBERG...

Digging Deeper Into the Reasons Behind the Issues

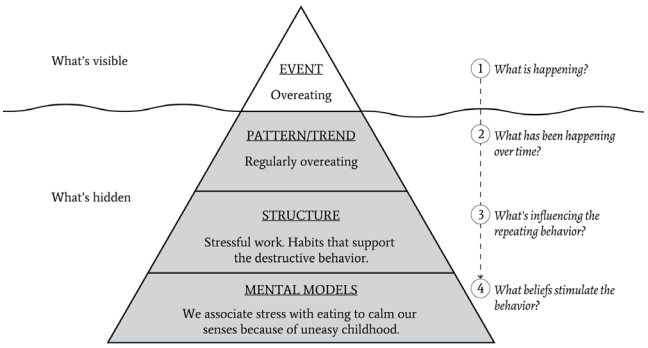


Figure 27: Iceberg Model

> "If we treat the system, we will never cure the disease. We need to understand what is causing the event to happen and apply fixes there." - Ivaylo Durmonski

The point of this exercise was to identify an event and investigate the pattern/trend that is underpinned through existing structures within society. We used these re-peating behaviours to hone in on the beliefs that drive them.

Figure 28:
Sorting the Problems We Identified Into a Hierarchy on the Iceberg Pyramid

6
IDEATION

Solution Generation

Applying our understanding of the local health-care system and experience with design thinking, we brainstormed many possible solutions (without judgement of these ideas) to see how and where we could suggest improvements

WHERE DO WE BEGIN?

Iceberg Diagram for Solution Development

These diagrams are a visual representation of brainstormed solutions in the conceptualization phase of the design thinking process. Each potential idea is organized by how systemic it is and then we identified the nature of the solution.

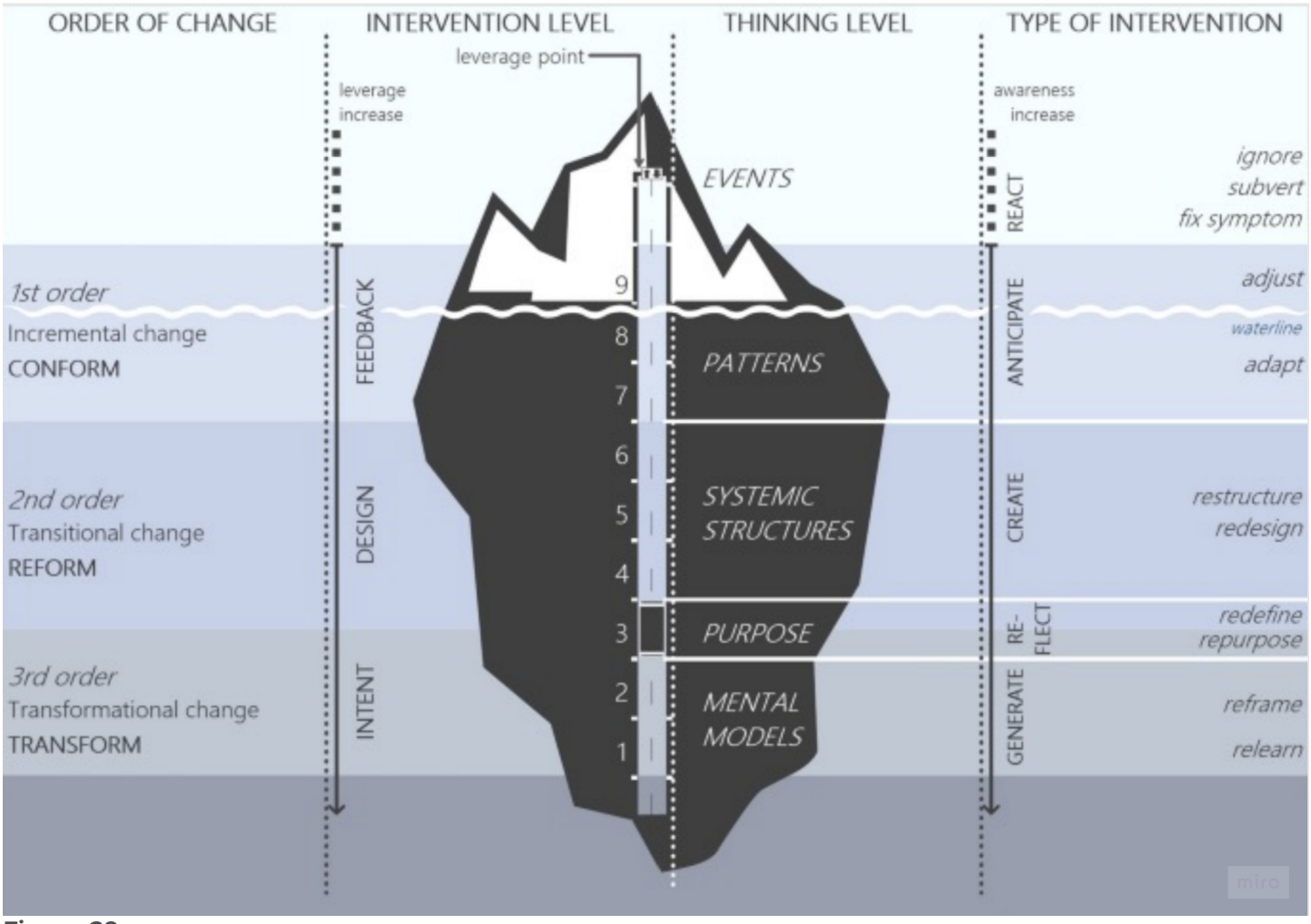
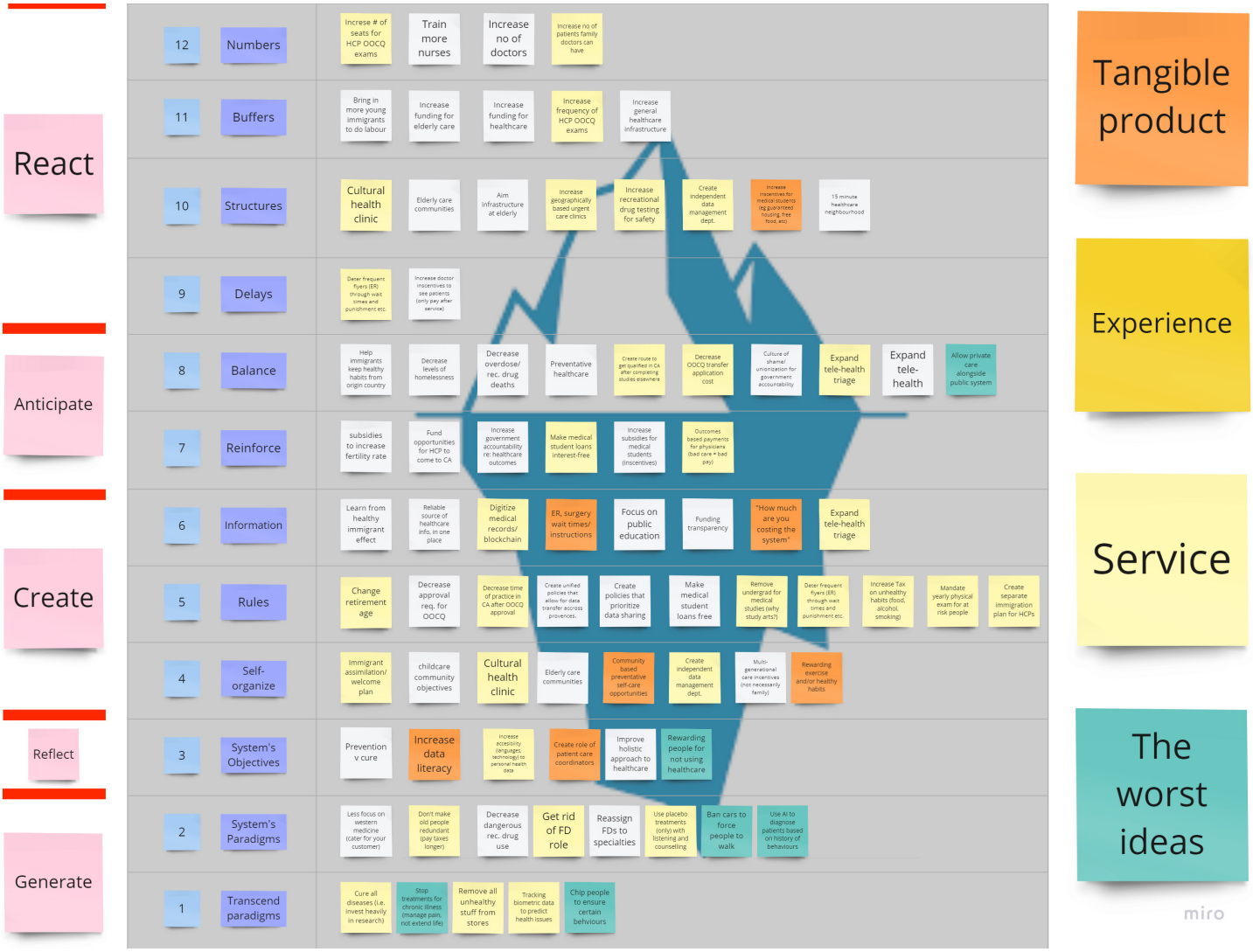


Figure 29:
Iceberg Model

Figure 30:
Iceberg Model



There are twelve main leverage points in the iceberg model developed by Donella Meadows, which represent the “places to intervene in a system.”

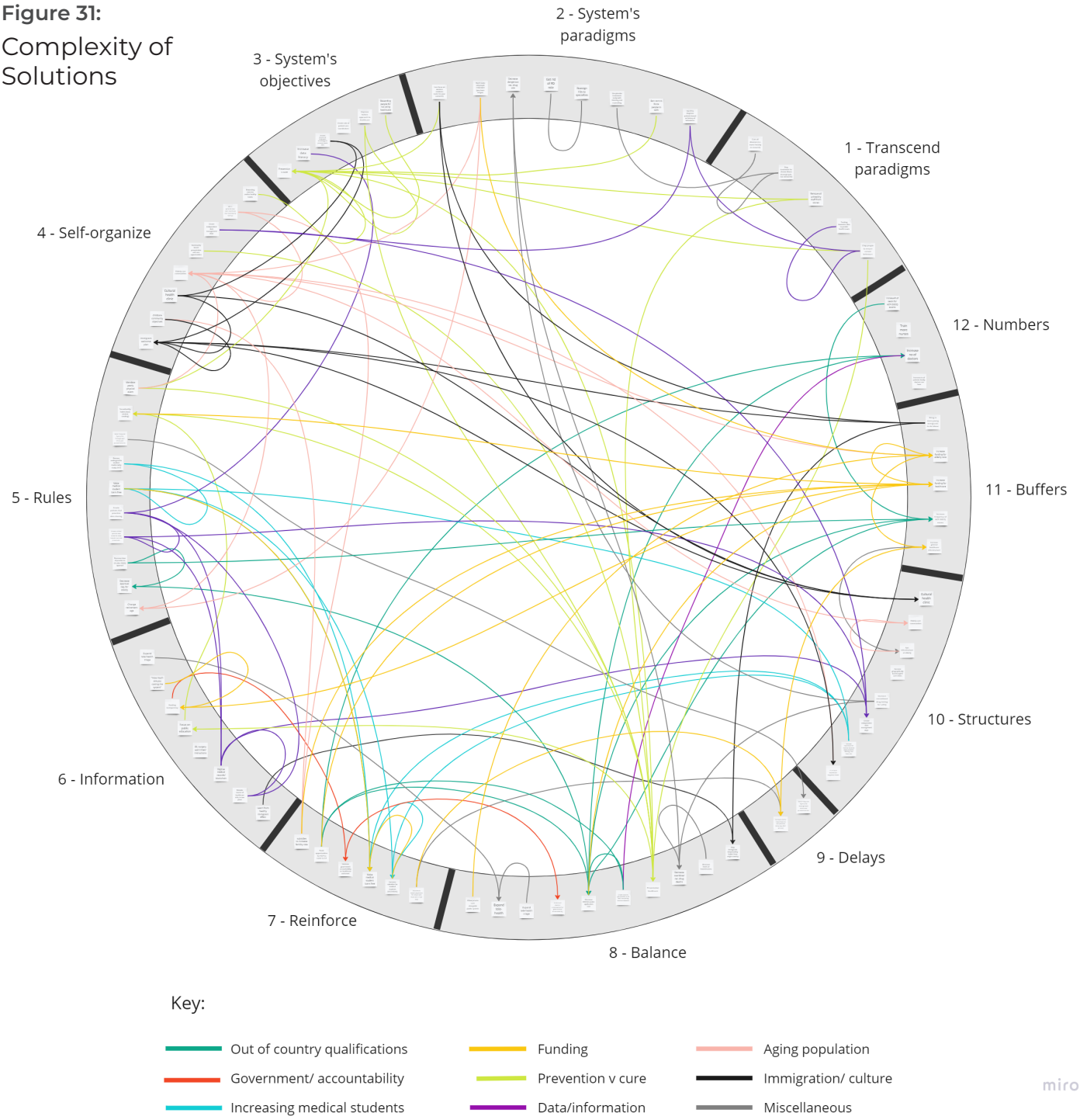
- The higher the number (12, 11, 10, ...), the simpler the solution and the easier it can be implemented. However, this also means that the solution is not a longer term change, but more of a quick fix.
- The lower the number (1, 2, 3, ...) the more complex the solution is to enact but the deeper the effects of the change on the system

INTERCONNECTIVITY

Understanding The Connections Between Solutions

With all of the generated solutions organized into their levels, we chose to place them around the perimeter of a circle and graphically connect the related ideas through colour-coordinated lines to trace the impacts of each intervention

Figure 31:
Complexity of Solutions



COMPLEXITY OF IDEAS

Making Sense of Our Solutions

This diagram was devised by the team to map out the interwoven nature of the tentative solutions. In the centre is the broad solution of bringing awareness to the public about the challenges facing the healthcare system and how to efficiently use it, when needed. Every solution is interconnected, and can be traced through the diagram with the simplest solutions in the middle (lightest) and the more complex and specific solutions around the outside (darkest).

Figure 32:
Hexagon Solution Map

7
SOLUTIONS

Proposed Implementation

The final stage of the systems thinking project was to analyze all solutions and create a hierarchy of feasability to see how and when the different concepts could work and take effect in relation to the SDG timelines

BUT WHAT ELSE CHANGES?

Understanding Cumulative Effects

Future wheels are a great tool to examine the impacts of a possible solution on people, society, the economy, and other existing systems at different levels from the initial implementation and beyond

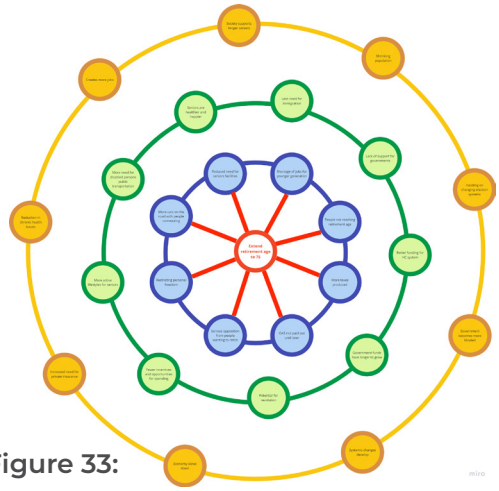
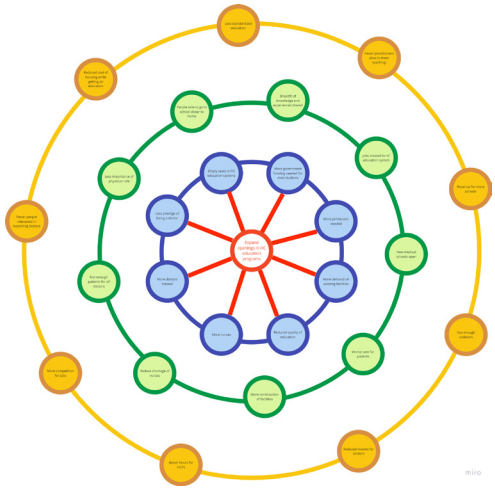


Figure 33:
Cause-effect maps

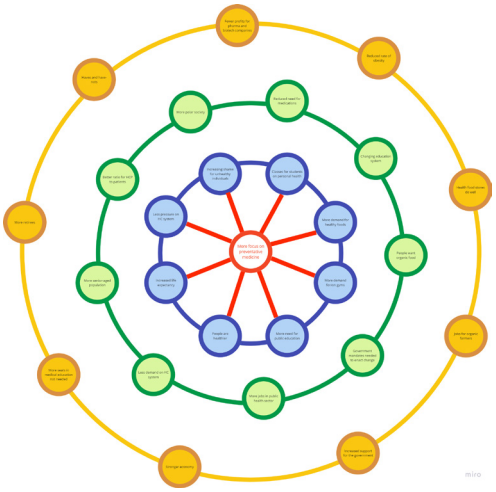
Extend and mandate later retirement age:

- Delay start of Old Age Security and Canada Pension Plan payments
- Improve incentives to retrain and re-educate at a mature age
- Increase the length of time that people pay income taxes
- Higher income tax rate for top earners



Expand openings in healthcare education programs:

- Simplify process for out-of-province trained healthcare professionals
- Increase number of seats in medical schools
- Incentivize nursing and other health-care training programs



More focus on preventative medicine:

- Reward people for healthy behaviours and tax unhealthy habits
- Undergrad and high school level courses on maintaining health
- Subsidize personal training and gym memberships
- Yearly physical exams for at-risk people

PART OF THE BIGGER PICTURE

Major SDG Relevance

As we finish off this project, it is important to remeber that there is already a global drive for sustainable development (the SDG goals). The complexity of the issue of efficient, affordable, and effective healthcare systems forms part of more than just SDG 3.

Our proposed solution has deep ties to SDG 4 (quality education) and SDG 8 (Decent Work and Economic Growth). Understanding how our solution touches onother SDGs is vital for ensuring it is implemented successfully.

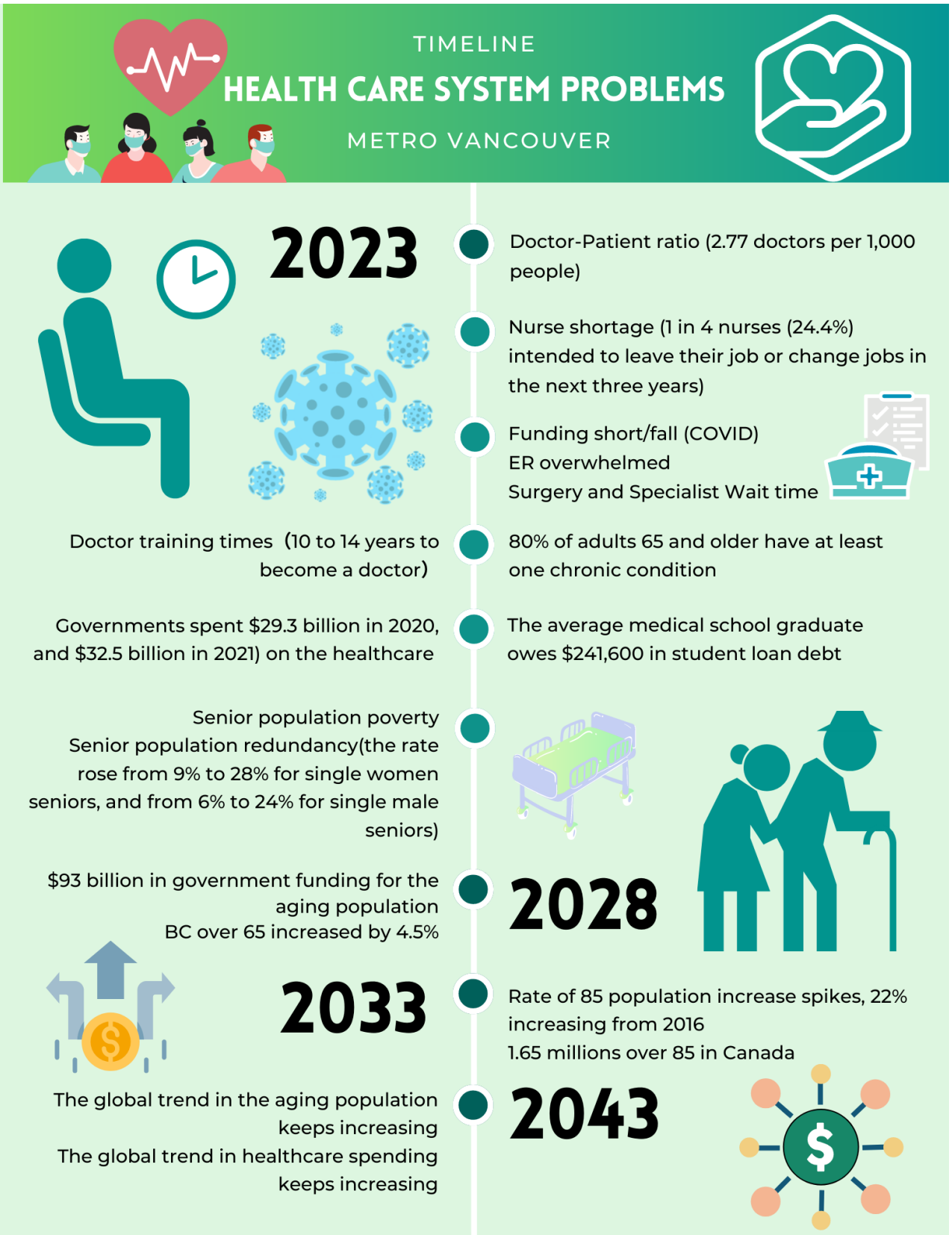
The days of thinking and working in silos must be long gone, and we must realize that in order to solve complex problems, we must find complex, multi-faceted solutions.

Figure 34: SDGs 3, 4, and 8

A GLIMPSE INTO OUR FUTURE

What Will Happen if We Don't Act Now

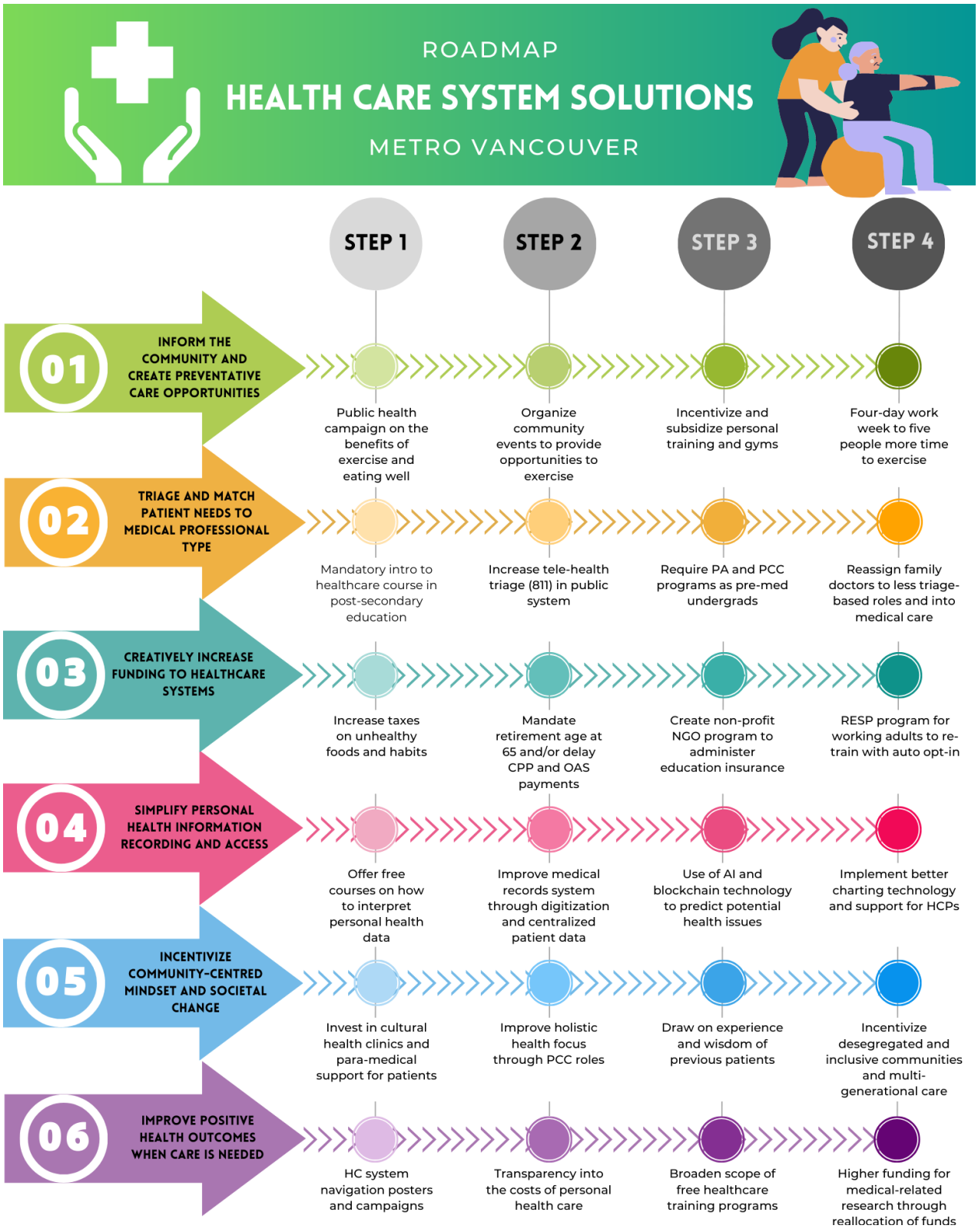
Figure 35: Timeline of Issues of Canada's Healthcare System



ALL GOOD THINGS TAKE TIME

Our Long-term Implementation Plan

Figure 36: Our Multi-solution Approach to Solving the Issue



8
SUMMARY

Project In Review

Lessons to Carry Forward From This Project

One of the key takeaways from this project is how much research goes into understanding and solving a complex problem. This is not an easy task. In fact, it may even seem daunting at times. However, it is a crucial part of the process.

We came to understand that Canada's healthcare system currently faces many problems, which will only grow in size if left untreated. It is vital that we put in the time and effort into understanding and implementing long term solutions to bring about systemic change.

Our solution focusses not only on solving the problem through an economic lens, but also a political and social lens.

It is a multi-faceted solution that must be implemented over multiple years. Some of our solutions can be implemented immediately, while others require a few years groundwork before being implemented. Regardless of the time it takes to implement the solution, they all work together to achieve one common goal: ensuring that Metro Vancouver's healthcare system provides affordable, efficient, and accessible healthcare to its people.

9
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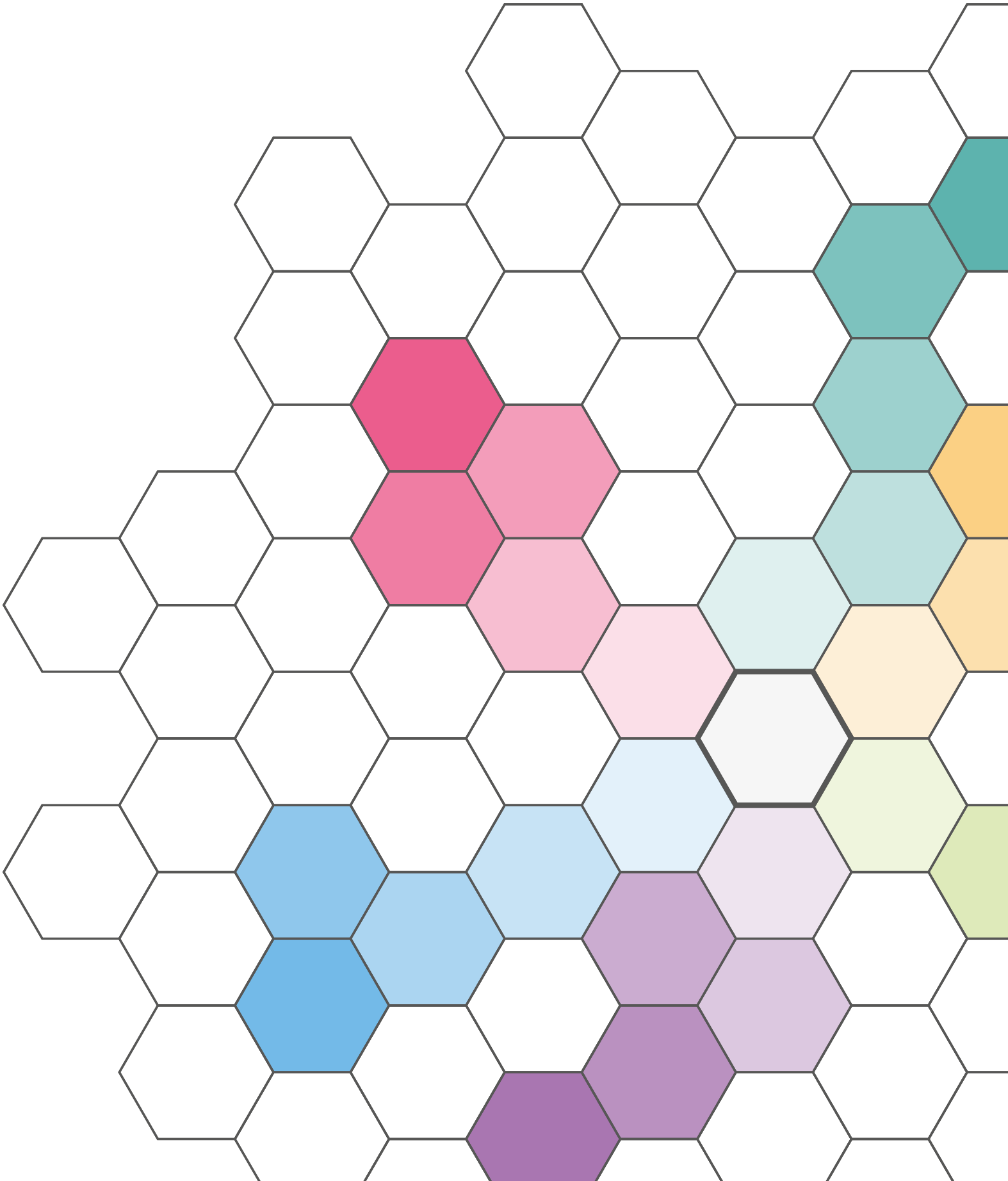

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