

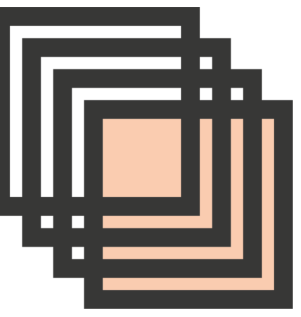
# CANADA HEALTH 2030

A MULTI-STAKEHOLDER EXPLORATION OF PERSONALIZED HEALTH



2021 | PAGES 63

COPENHAGEN INSTITUTE FOR FUTURES STUDIES



## Foreword

Canada, especially now, with many lessons learned from the COVID-19 pandemic, is at the crossroads of designing and driving the future of personalized healthcare. Politicians and healthcare leaders have the mandate to shape the future of healthcare in Canada towards 2030. This requires a paradigm shift towards personalized healthcare and collaboration between sectors and across borders, pushing Canada to the forefront of innovation and development in healthcare. Canada Health 2030 marks the first step in this direction. Together with the Copenhagen Institute for Futures Studies, over 40 healthcare stakeholders from across Canada developed four plausible futures for the development and advancement of personalized health in Canada. These scenarios are an essential tool to realize an equitable and accessible personalized health landscape across Canada. In this report, you will find four richly developed and contextualized scenarios exploring the Canadian healthcare landscape towards 2030. Beyond that we present the benefits and pitfalls of each scenario and leave you, the reader, with must-win battles for Canada. We do not imagine these are easy battles to win, but these unique challenges present a combination of technological and philosophical hurdles that must be overcome. As you read this report, we implore you to imagine your role in creating an equitable and accessible personalized health landscape in Canada.

# CANADA HEALTH 2030

A MULTI-STAKEHOLDER EXPLORATION OF PERSONALIZED HEALTH



## TABLE OF CONTENTS

04	Executive Summary
06	Introduction to Canada Health 2030
08	Scenarios for Personalized Health
19	From Scenarios to Actions
26	Deep Dive
54	Methodology & Process
59	Contributors & Participants

### CONTACT

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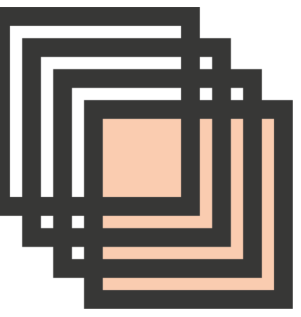
Director of Health,

Copenhagen Institute for Futures Studies

This report was facilitated by the Copenhagen Institute for Futures Studies, and developed with support from, and on behalf of, Hoffmann-La Roche Limited.



# 1. Executive Summary



## Executive Summary

Over 40 healthcare decision makers from across Canada, together with the Copenhagen Institute for Futures Studies, developed four plausible futures to realize and advance personalized health in Canada.

Building upon the shared understanding that personalized health is a shift from one-size-fits-all treatment of disease to maintaining high and healthy quality of life over the lifespan by applying the right health interventions for the right person at the right time. An ideal personalized healthcare system involves the collection and analysis of all meaningful health data at scale and the integrated use of tools and services to tailor prevention, diagnosis, treatment and follow-up to each person, while simultaneously cultivating both individual and population health.

This report presents the findings of these efforts and contains the following information:

1. Four plausible scenarios for personalized healthcare (PHC) in Canada towards 2030, based on two critical uncertainties identified by the Canada Health 2030 process participants. One scenario (Scenario B “Collaborative Health for Living”) was identified as the ideal scenario that Canada should strive to realise.
2. An actionable roadmap for realizing PHC in Canada towards 2030.
3. A deep dive section with extended scenario narratives and an analysis of their benefits and pitfalls, short narratives exploring possible individual experiences for each scenario, and a detailed description of the scenario process methodology.



## 2. Introduction



# CANADA HEALTH 2030

## INTRODUCTION

The emergence of digital health services, the growing acknowledgement that today's healthcare models are unsustainable, and learnings from the COVID-19 pandemic are motivating a global shift towards more personalized and integrated approaches to healthcare. With preventive services, earlier interventions, and more tailored treatments, people can achieve and maintain better levels of health and wellbeing, and health systems can greatly increase their efficiency and effectiveness. Countries with a sophisticated health system and mature technology sectors, like Canada, are positioned to not only benefit from this shift, but also play a central role in designing and driving the future of personalized healthcare. However, achieving this requires a radically new way of thinking and unprecedented levels of coordination and collaboration between individuals, institutions, and jurisdictions. Canada, especially with many lessons learned from the COVID-19 pandemic, is at the crossroads of making this possible. Leaders now have the opportunity to come together to support the paradigm shift towards personalized healthcare and drive collaboration between sectors and across borders, pushing Canada to the forefront of the innovation and development in healthcare. Canada Health 2030 marks the first step in this direction.

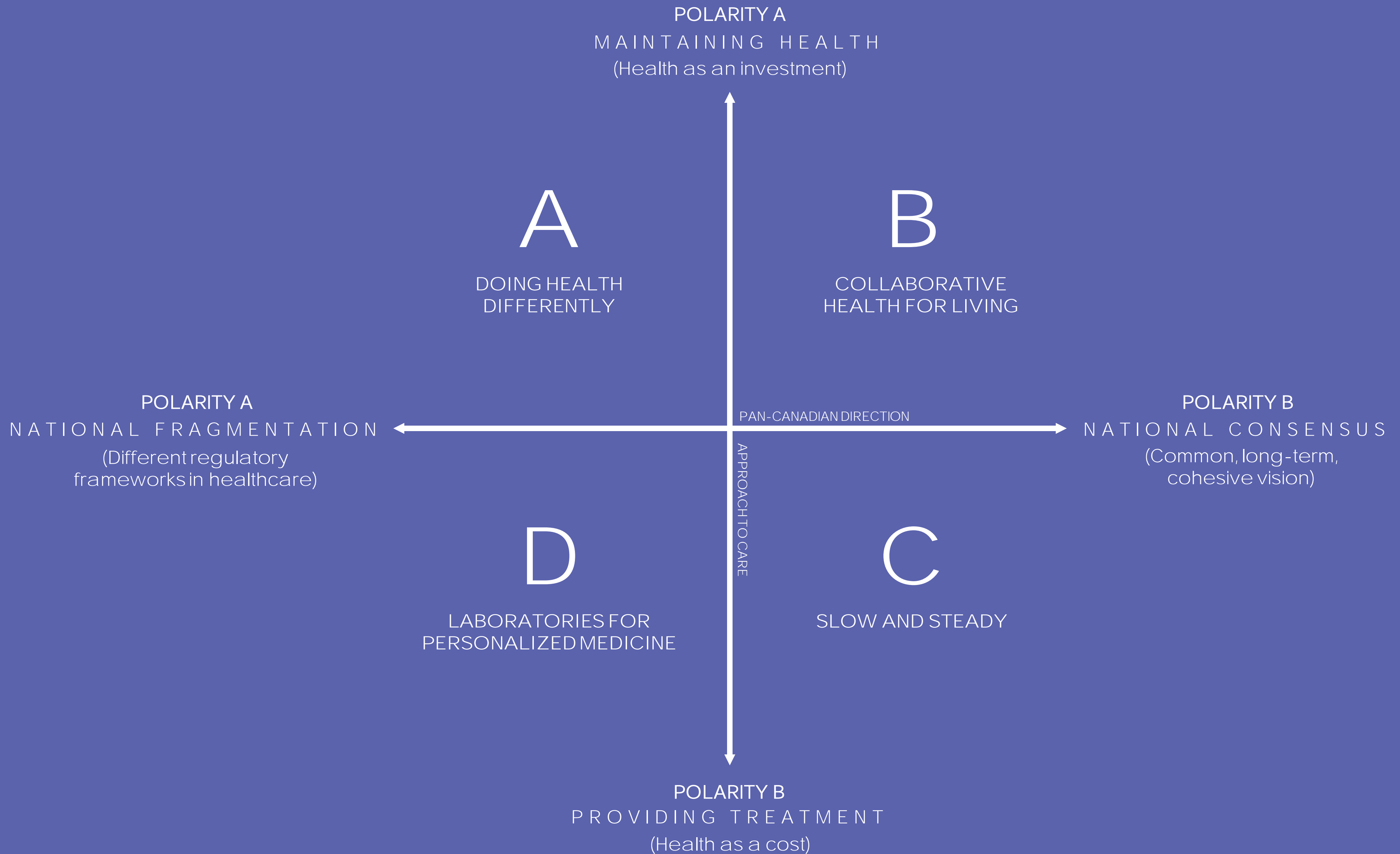
Canada Health 2030 is a pan-Canadian, multi-stakeholder initiative to explore the future of personalized healthcare (PHC) in Canada towards 2030 and build partnerships for healthcare improvement facilitated by the Copenhagen Institute for Futures Studies (CIFS) and supported by Hoffmann-La Roche. Over four online workshops in 2021, more than 40 healthcare stakeholders representing the healthcare workforce, researchers, patient organizations, industry, and the public sector came together to develop four plausible scenarios for PHC in Canada towards 2030. These scenarios are built on Canadian stakeholders' experiences and visions for Canadian healthcare as well as CIFS's expertise in scenario planning and offer snapshots of how PHC could develop in Canada over the coming decade.

By taking on the Canadian healthcare landscape from an exploratory perspective, the scenarios provide a basis on which public and private healthcare stakeholders in Canada can develop strategies to further support ongoing efforts in realizing PHC, as well as establish collaborative cross-sectoral and cross-border initiatives for supporting personalized healthcare.

By charting potential courses for the development of PHC in Canada towards 2030, these scenarios reveal important opportunities and challenges for the entire Canadian health ecosystem. Each scenario has benefits and pitfalls; therefore, regardless of the path that Canadian health takes towards 2030, these scenarios are an essential tool to build and realize a robust vision for PHC in Canada.



# 3. Scenarios for Personalized Health



# 2030 SCENARIOS FOR PERSONALIZED HEALTH IN CANADA



## Scenario A: Doing health differently

Towards 2030, Canada is globally recognized for its stance on maintaining health. At the federal level, prevention budgets have been allocated to the areas of primary prevention, early intervention, and health promotion through education; with provincial discretion. Industry players and public health providers drive the Canadian healthcare ecosystem. Local start-ups are amongst the main innovators in the field and receive government support to implement personalized health ideas. A lack of scalability is a by-product of the fragmentation. While governments support local, community-driven PHC initiatives, their national application is limited. In leading provinces, significant aspects of clinical decision support and administrative tasks are taken over by AI, while in lagging provinces AI can be seen in administrative tasks, with ongoing efforts to catch up. Towards 2030, citizens embrace their role and responsibility in remaining healthy. Tech savvy, digitally literate citizens demand non-clinical services, health coaches, digital tools, apps, and wearables, which provide a granular understanding on how to best maintain health.

## Scenario B: Collaborative health for living

By 2030, a concerted shift towards a wellbeing economy has helped Canada establish PHC as the mainstay of healthcare delivery. With the move towards PHC, the public sector has acknowledged the need for private innovation, despite increasingly fierce competition in health services. New players in health operate alongside established industries, with a trove of personal and health-relevant data providing new opportunities to support the health system. Public-private interactions have been instrumental in supporting the harmonization of citizens' health data across borders, promoting joined-up care delivery throughout Canada. This progressive agenda has met with challenges as well as advantages. With widespread consensus as the driving force in the shift to PHC, the pace of implementation and scaling of new solutions can be sluggish. New value-based reimbursement models are being implemented to shift health systems' focus from outputs to outcomes that emphasize prevention and quality of life, and rewarding such, rather than based on number of pills sold.

## Scenario D: Laboratories for personalized medicine

By 2030, continued fragmentation between the provinces & territories and a prolonged risk-averse approach to providing treatment, has led to uneven development of PHC. In the absence of a comprehensive national plan, although supported by federal resources, leading provinces & territories – sometimes in regional collaborations – have developed personalized care models and solutions. Although the market is fragmented in Canada, various constellations of industry, patient organizations, and interest groups have set out to establish cross-border and multi-disciplinary collaborations to harmonize approaches to PHC and allow national implementation of new healthcare solutions. The purpose of the system is to address illness once it emerges and to limit the time that people are ill. Technology has an increasingly prominent role in most Canadians' experiences of the healthcare system and health service delivery. The primary goal of Canada's health systems is to provide high-quality treatment overall, leading provinces and territories have invested resources in improving health and digital literacy. The aim is to support Canadians to maintain their health by providing them with the tools and resources to easily access and navigate the health system and improve early detection of disease.

## Scenario C: Slow & steady

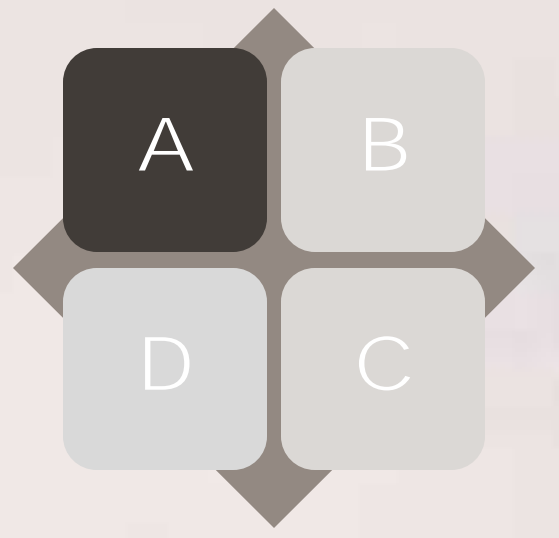
In 2030, Canada's healthcare system is globally renowned for providing its citizens with the best possible treatment. Personalized medicine is the leading paradigm and the main driver for an integrated health system – this has resulted in the scaling up of cross-jurisdictional personalized medicine. Provincial and federal governments are responsible for different elements of operation, while industry players take the lead on technology. This differentiated approach has helped position Canada as a world leader in personalized medicine. Public-private partnerships are common, following a history of successful trials and a focus on individual and societal outcomes, as well as sustainable business models. Tech, pharma, and diagnostics are major drivers of innovation, supported by the federal government. The health system focuses on treatment of disease and secondary and tertiary prevention; i.e., early diagnosis and intervention to speed up recovery. This has led to the development of a strong clinical evidence base and is enabled by access to data, but as governments change, so do attitudes around data. Over time, it has been recognized throughout Canada that sharing data has a positive net benefit both for individual's and society.

# SCENARIO A

*GLOBAL REGIONS FOR HEALTH TO REALIZE 'LEAVING NO ONE BEHIND' AS A HEALTH DRIVER*

TITLE: DOING HEALTH DIFFERENTLY

AXES: NATIONAL FRAGMENTATION / MAINTAINING HEALTH



## **BREAKING NEWS**

**Canada directs 20% of health budget towards health education and prevention**

**POLL: CITIZENS EMBRACE INCREASED RESPONSIBILITY IN REMAINING HEALTHY**



### POLITICAL LANDSCAPE

Towards 2030, Canada is globally recognized for its stance on maintaining health. At the federal level, prevention budgets have been allocated to the areas of primary prevention, early intervention, and health promotion through education; with provincial discretion. By letting the provinces and territories find their own solutions, the hope is to have locally optimized health systems. At the federal and provincial level, a ‘health in all policies’ mindset is increasingly prevalent, and the impact on health is studied when passing legislation or examining the influence of policies.

### PAN-CANADIAN ECOSYSTEM

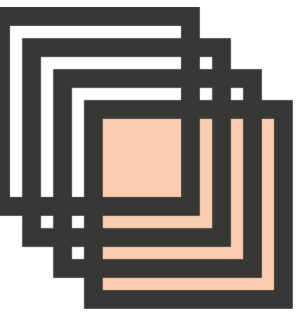
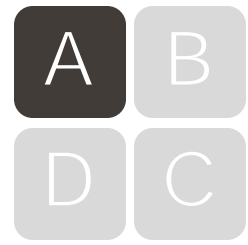
Industry players and public health providers drive the Canadian healthcare ecosystem. Local start-ups are amongst the main innovators in the field and receive government support to implement personalized health ideas. A lack of scalability is a by-product of the fragmentation. While governments support local, community-driven PHC initiatives, their national application is limited. Technology companies entering the health ecosystem fall into two broad categories – those that specialize in selling highly customized solutions at a local level, and those that aspire to provide pan-Canadian solutions, but struggle to gain traction across multiple settings. There is also a rise in public-private partnerships at the federal level to address the challenge of scalability. Established insurance providers such as Manulife Financial have partnered with start-ups to launch pilots in leading provinces, with the goal of a pan-Canadian rollout. Federal efforts are also reflected in infrastructure investments to make telehealth and remote health universally accessible. Over the past decade, digital interoperability within provinces has been achieved, though interoperability between provinces is limited. Pan-Canadian organizations such as CIHI & CIHR are attempting to develop a layer of interoperability between systems, though this is still work in progress as commitment from provinces & territories varies.

### CANADIAN HEALTH SYSTEMS DESIGN

The public health system in Canada has embraced emerging technologies to varying degrees. In leading provinces, significant aspects of clinical decision support and administrative tasks are taken over by AI, while in lagging provinces AI can be seen in administrative tasks, with ongoing efforts to catch up. Due to fragmentation, adoption of new technologies varies. In leading provinces, multi-omics are adopted in patient care, especially in disease screening leading to earlier interventions, while in lagging provinces the clinical utility is limited to genetic screening and sequencing and tends to focus on cancer, rare diseases, and cardiovascular health. However, even in these instances, patient experience has seen a marked improvement. As part of coherent care in leading provinces, municipal health workers have access to these tests to assist citizens in making beneficial lifestyle changes that might prevent or minimize the effect of disease. Over the past decade, patient experience has seen a marked improvement across Canada. Increasingly, municipalities, community workers, and doctors are working together to address current and future health needs. Capitation is the main model of reimbursement for family physicians and community workers, which ensures that treatment and prevention are reimbursed. The changing approach to healthcare is also reflected within the training and education provided to healthcare professionals. Social determinants of health are a major aspect of training and are no longer viewed as an auxiliary area. The private sector is poised to benefit from the fragmentation in the Canadian health landscape. For example, tech players partner with hospitals to provide added value through local digital functions, while insurers work with municipalities to trial tailored solutions, such as biometric screenings in public libraries and in-home check-ups for high-risk groups. Where private players try to adopt a pan-Canadian approach, in line with the federal government’s initiatives, it is often the larger provinces that attract and shape this investment. There are efforts for smaller provinces & territories to be included in pilots; however, due to the nature of investments and the required returns, it is often the larger populations that are better placed to reap the early benefits.

### CANADIAN CITIZENS AND PATIENTS

Towards 2030, citizens embrace their role and responsibility in remaining healthy. Tech savvy, digitally literate citizens demand non-clinical services, health coaches, digital tools, apps, and wearables, which provide a granular understanding on how to best maintain health. Heavy investment from the federal government with a focus on prevention is bearing fruit. Targeted social measures, such as sports and healthy lunches in schools, access to psychologists & social workers, have instilled, especially among the younger generation, the value of a proactive health approach. Leading provinces have their finger on the pulse and use multi-omics as indicators of disease prior to disease development, thereby enabling them to intervene earlier. Unfortunately, in some provinces the response is slower, which leads to certain segments falling through the cracks. Despite regional differences, Canadians’ trust regulations and believe their data is secure at a federal and provincial level. Tech players are held to high standards, and citizens expect a reciprocal relationship in exchange for their data, as a partner in health technology.



## BENEFITS & PITFALLS

### BENEFITS OF THIS SCENARIO

- Faster implementation at the local/jurisdictional level.
- Increased social focus, younger population actively participate in health management.
- Technology companies develop tailored, local solutions.

### PITFALLS OF THIS SCENARIO

- PHC potential underutilized due to lack of Pan-Canadian vision.
- Smaller, less developed health systems in provinces & territories are left behind.
- Citizens/communities with complex needs are overlooked and underserved.

## MUST-WIN BATTLES

Create awareness and understanding of PHC such that patients and citizens understand its benefits and demand it for themselves

### FEDERAL LEVEL

- Creating equal opportunity for the private sector to be in the health space

### PROVINCIAL LEVEL

- Focus on health and tech literacy and personalized information
- Harmonized data access and sharing for care, research, and innovation

### INDUSTRY LEVEL

- Secure buy-in for scalable solutions

### SOCIETAL LEVEL

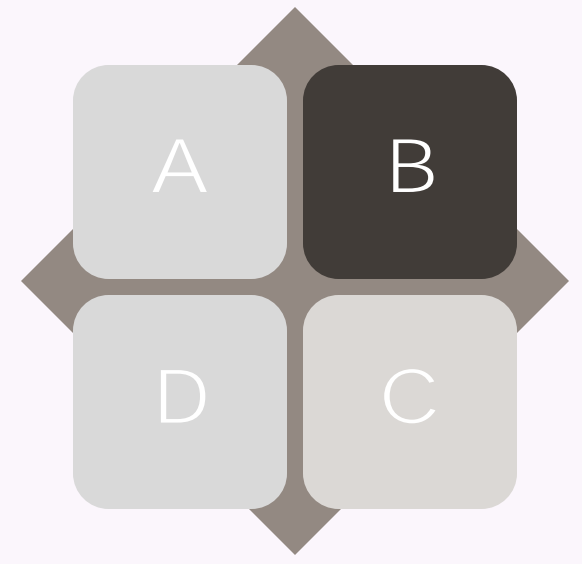
- Recognize the needs of rural and remote communities and provide access to them
- Make sense of different streams of information and apply them to individual health journeys

# SCENARIO B

*CANADA IS THE WORLD LEADER ON WELL-BEING AS AN ECONOMIC DRIVER*

TITLE: COLLABORATIVE HEALTH FOR LIVING

AXES: NATIONAL CONSENSUS / MAINTAINING HEALTH



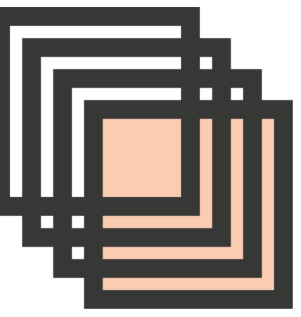
**BREAKING NEWS**

**11 Provinces and Territories Sign Pan-Canadian Health Coalition's PHC Pledge**

**"WE MUST LEVERAGE OUR AI STRONGHOLDS IN HEALTHCARE" SAYS COALITION CHAIRPERSON**

# A B Scenario B

## D C COLLABORATIVE HEALTH FOR LIVING



### POLITICAL LANDSCAPE

By 2030, a concerted shift towards a wellbeing economy has helped Canada establish PHC as the mainstay of healthcare delivery. The ambitious goals set by the federal government, reinforced with strong incentives for collaboration, have allowed key stakeholders to join forces across the provinces and territories. Canada has begun to reap the rewards from its strongholds in AI and investments in key areas, including digital health infrastructures. Most notably, after a successful pilot on a federated health data system, implementation across the country has begun, adding to Canada's global competitiveness in PHC. Moreover, intensive efforts to improve early detection of disease and to foster jurisdictional cohesion through a 'health in all policies' approach have led to meaningful recognition of the social determinants of health across all areas of government, and programs have been activated to redress inequality.

### PAN-CANADIAN ECOSYSTEM

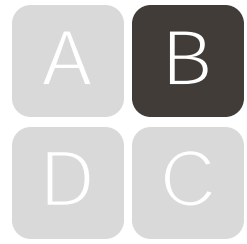
With the move towards PHC, the public sector has acknowledged the need for private innovation, despite increasingly fierce competition in health services. New players in health operate alongside established industries, including big tech companies, life science and tech start-ups, pension funds, and insurance companies, with a trove of personal and health-relevant data providing new opportunities to support the health system. Consequently, the role of public Canadian institutions, such as Canada Health Infoway, has expanded, accelerating the adoption of digital health solutions. This has enabled the creation of partnerships eager to exploit the success of the public-private partnerships that were so influential in combating COVID-19 in the early 2020s. Public-private interactions have been instrumental in supporting the harmonization of citizens' health data across borders, promoting joined-up care delivery throughout Canada. This progressive agenda has met with challenges as well as advantages. With widespread consensus as the driving force in the shift to PHC, the pace of implementation and scaling of new solutions can be sluggish.

### CANADIAN HEALTH SYSTEMS DESIGN

New value-based reimbursement models are being implemented to shift health systems' focus from outputs to outcomes that emphasize prevention and quality of life, and rewarding such, rather than based on number of pills sold. Multidisciplinary care teams (MDTs) are a fundamental unit of the healthcare system and are reimbursed via a global budget based on citizens' health outcomes. Additionally, wellbeing prescriptions have been introduced, focusing for example on time in nature, exercise, rest, and nutrition as alternative interventions to pharmaceutical products, resulting in a broadening of industry products to include digital health interventions alongside traditional drug pipelines. Major public institutions, such as CIHI, the Public Health Agency of Canada, and Canada Health Infoway, collect and distribute essential information on population health, which private institutions can access to build services and insights that benefit both individual and population health. This alignment of PHC and public health has allowed development of a learning system with insight travelling in both directions, leading to improved outcomes. High-quality digital therapeutics are a standard offering; the establishment of digital twins; i.e., a virtual replica of a person's biological profile, is becoming more readily available to citizens. The next phase will be the establishment of a "digital triplet". This is currently being piloted by three provincial innovation hubs to enable comprehensive in-silico testing of medical interventions, drawing on an individual's digital and biological phenotype to enable personalized real-time modelling. Legislative harmonization, while a slow and demanding process, has improved flows of data, as well as access to and portability of care across provincial and territorial borders, further supporting modelling capabilities, while the exchange of data between the public and private sectors has allowed citizens and patients to gain comprehensive insights about their health and wellness both within and outside of the clinic, Canada is struggling to achieve adequate levels of health (and technical) literacy, especially among the elderly and geographically marginalized groups. The health system's increased focus on more holistic approaches to healthcare has also highlighted a need for upskilling and developing new competencies among the healthcare workforces.

### CANADIAN CITIZENS AND PATIENTS

By 2030, both citizens and the healthcare system embrace the notion that prevention is the most powerful tool to maintain good health and wellbeing for the longest possible time. Through technology use and increased support from the healthcare system, citizens have become empowered partners in their own health. However, for marginalized groups there are still barriers to obtaining the same level of health and digital literacy as the better-off. Achieving equity in this area is therefore a major focus for public and private actors alike, politically bolstered by the genuine recognition for health in all policies. Additional support is provided for those who need it by health coaches, digital health tools and companies that test and evaluate their efficacy, and community health workers. A high level of care has been made possible through access to data for the healthcare system and individuals, accompanied by a general willingness to share data, to the extent that privacy and security concerns are alleviated by regulation and trust in the key health organizations and institutions.



# Scenario B

COLLABORATIVE LIVING FOR HEALTH



## BENEFITS & PITFALLS

### BENEFITS OF THIS SCENARIO

- Pan-Canadian and inter-provincial organizations have convening powers to secure progress and harmonization across jurisdictions
- There is a greater understanding of reciprocity across the population
- Strong public-private partnerships that deliver value for citizens

### PITFALLS OF THIS SCENARIO

- While the prevention agenda prevails, there are strong headwinds driven by short-term political cycles that want quick results
- Those with lacking health and digital literacy could potentially still fall through the cracks
- Disparities could potentially get larger due to differences in capabilities and access to infrastructure (including technology)

## MUST-WIN BATTLES

Emphasizing a health-in-all policies approach and maintaining health rather than disease management

### FEDERAL LEVEL

- Realize political mandate for sustainable, long-term change

### PROVINCIAL LEVEL

- Achieve buy-in from provincial and territorial leaders to address the risk of losing autonomy

### INDUSTRY LEVEL

- Redefine the industry's role, responsibilities, and leadership in health

### SOCIETAL LEVEL

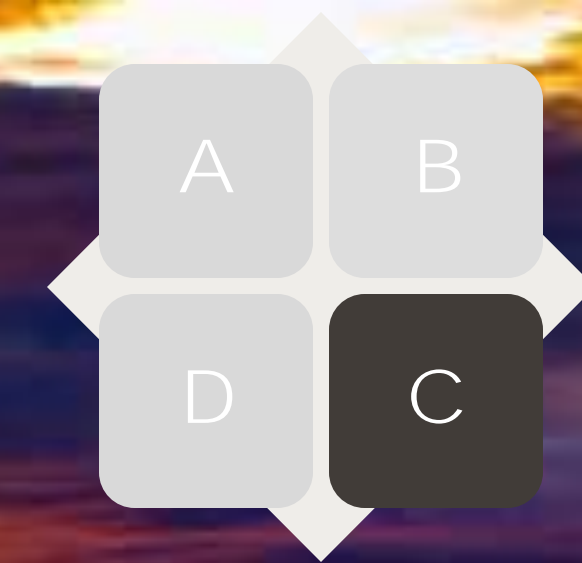
- Build multi-layered trust among and between citizens, organizations and companies to achieve interoperability

# SCENARIO C

*CANADA PERSONALIZED MEDICINE COALITION – DRIVING GLOBAL REFERENCE  
GENOMES PROGRESS*

TITLE: SLOW AND STEADY

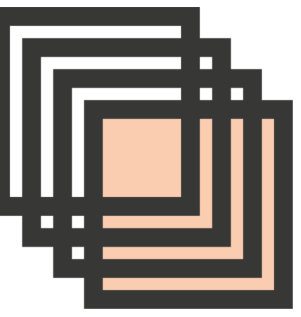
AXES: NATIONAL CONSENSUS / PROVIDING TREATMENT



**BREAKING NEWS**

**Canada celebrates 5 years of the Coherent  
Care Vision 2025**

**"IMPROVED OUTCOMES FOR PATIENTS" SAYS MINISTER OF HEALTH**



### POLITICAL LANDSCAPE

In 2030, Canada's healthcare system is globally renowned for providing its citizens with the best possible treatment. Personalized medicine is the leading paradigm and the main driver for an integrated health system – the product of a long-term political and industrial coalition after the COVID-19 pandemic. The primary goal of this coalition is to provide the same standard of care across all provinces and territories, resulted in the scaling up of cross-jurisdictional personalized medicine. Provincial and federal governments are responsible for different elements of operation, while industry players take the lead on technology. This differentiated approach has helped position Canada as an integral player within the global personalized medicine coalition and a world leader in personalized medicine

### PAN-CANADIAN ECOSYSTEM

The healthcare industry and the public healthcare system are key players in the market. Industry focuses on creating new solutions for better treatment, while the public health system focuses on implementation. Public-private partnerships are common, following a history of successful trials and a focus on individual and societal outcomes, as well as sustainable business models. Tech, pharma, and diagnostics are major drivers of innovation, supported by the federal government whose main role is convening innovation processes. Generally, government tenders emphasize open innovation rather than prescribing ways of solving challenges. Proof-of-concept pilots within provinces are encouraged as the first step, with successful initiatives rapidly rolled out across similar provinces and territories. Pan-Canadian organizations such as CIHI and CIHR have been granted the power to incentivize and drive interoperability across different systems. Therefore, high levels of interoperability are only hindered by limited technical infrastructure in rural areas with slow or no connectivity. To remedy this, Bell, Telus, and Rogers, with support from public funding bodies, have been collaborating with rural communities to co-develop solutions to bridge the gap between urban and rural areas.

### CANADIAN HEALTH SYSTEMS DESIGN

The health system focuses on treatment of disease and secondary and tertiary prevention; i.e., early diagnosis and intervention to speed up recovery. Emerging technologies play a key role in the system and provide significant value. For example, all parents are offered full genome sequencing for their newborns. This allows doctors to consider the optimal treatment for each patient over their lifetime. The healthcare system concentrates on curing illness efficiently in multidisciplinary care teams, to support coherent polypharmacy. In medical education, augmenting medical knowledge, and effective collaboration are prioritized. Additionally, all health workers are provided continuous medical education (CME) credits for upskilling in emerging technologies and digital health. Care teams are reimbursed in multiple models, with emphasis on providing value for patients. This has led to a system of capitation, with add-ons based on diagnosis-related groups as the main reimbursement model for the primary physician. Global budgets are the main model for the care team with add-ons in the form of pay-for-performance available for all members of the care team. Patients receive coherent and portable care across Canada, leading to fewer duplications of tests, less risk of error, faster recovery from illness, and better health outcomes. A new role has been established within the system for 'health system navigators' who liaise with patients and support them to understand their care. Additionally, the navigators oversee all administration, including reimbursement between different providers and members of the care team. Data sharing is recognized as an integral aspect of treatment, and reciprocity is built into the system; i.e., patients share data to improve care for all. Provinces lead the charge in agreeing to share data amongst themselves, at first for research purposes, and later for wider use, aided by the CIHI and CIHR. Data sharing is supported with an electronic health record that records consent preferences and enables integrated patient oversight, alongside targeted health, and technical literacy support for patients to understand the need and use of data.

### CANADIAN CITIZENS AND PATIENTS

The Canadian health system mantra is to help sick people get better faster, which is generally accepted by Canadians. This is done through early detection of disease, provision of state-of-the-art care, and monitoring after illness. People generally have a better understanding of their health and an understanding of their societal responsibility to help improve care, but geographical and socioeconomic disparities heavily influence levels of health literacy. Well-off citizens are empowered to take more responsibility of their health as tech companies help promote digital literacy on behalf of the public system. The point of care is wherever treatment can be administered most effectively, which is still, most often, in physician's offices or hospitals. Greater emphasis is placed on end-of-life care, with a huge cost associated with supporting an aging population, alongside enhanced expectation for higher quality of life for longer. This has led to the development of a strong clinical evidence base and is enabled by access to data, but as governments change, so do attitudes around data. Over time, it has been recognized throughout Canada that sharing data has a positive net benefit both for individual's and society.



## BENEFITS & PITFALLS

### BENEFITS OF THIS SCENARIO

- Integrated treatment of disease leading to efficient delivery of care.
- Focused personalized medicine with better health outcomes and shorter waiting times.
- Better access to health data for research and care.

### PITFALLS OF THIS SCENARIO

- PHC potential underutilized due to focus on treatment
- Smaller, less developed health systems in provinces & territories are left behind.
- Prevention, quality of life and social determinants of health are overlooked

## MUST-WIN BATTLES

Responsible and accountable leadership at the federal, provincial, and industry levels to enable data sharing

### FEDERAL LEVEL

- Support for digital connectivity and infrastructure enabling equity across Canada
- Incentivize health workers to embrace technology and new modes of reimbursement

### PROVINCIAL LEVEL

- Embrace collaboration to drive precision medicine.
- Ensure individual data is kept secure and utilized to improve the standard of care

### INDUSTRY LEVEL

- Support health technology innovation
- Participate actively in public-private partnerships

### SOCIETAL LEVEL

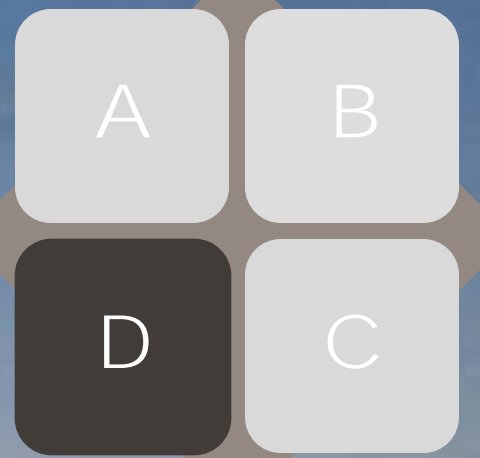
- Access to early detection and precise intervention

# SCENARIO D

*GLOBAL LIFE SCIENCE TEST BED WITH LEADING POCKETS OF THE FUTURE*

TITLE: LABORATORIES FOR PERSONALIZED MEDICINE

AXES: NATIONAL FRAGMENTATION / PROVIDING TREATMENT



## **BREAKING NEWS**

**Four Provinces Lead in Clinical Application of Genomics -  
Others Fall Behind**

**TORONTO PHC LAB WINS GLOBAL INNOVATION CHALLENGE**



### POLITICAL LANDSCAPE

By 2030, continued fragmentation between the provinces & territories and a prolonged risk-averse approach to providing treatment, has led to uneven development of PHC. In the absence of a comprehensive national plan, although supported by federal resources, leading provinces & territories – sometimes in regional collaborations – have developed personalized care models and solutions. This has given rise to globally recognized centres of excellence in PHC, which have leveraged existing Canadian strengths such as AI and genomics to build local, regional, and international partnerships, while other provinces risk lagging.

### PAN-CANADIAN ECOSYSTEM

Differences in regulation between the provinces & territories have become pronounced following the 2026 Provincial Personalized Health Priority Act, which incentivizes provinces and territories to build capacities in PHC but does not stipulate how to achieve this goal. Rather than promoting standardization and coherence, it has further fragmented healthcare delivery, leading to discrepancies in the quality of care experienced by Canadians. It has also had mixed results for industry as different provinces & territories have taken both protectionist and free market approaches, leading to complex variation that is difficult for industry to navigate at a national level. Although the market is fragmented in Canada, various constellations of industry, patient organizations, and interest groups have set out to establish cross-border and multi-disciplinary collaborations to harmonize approaches to PHC and allow national implementation of new healthcare solutions. Notably, these coalitions have been successful in helping leading provinces & territories to adopt international standards that further drive research, innovation, and technical interoperability as well as build partnerships with public and private frontrunners, both within Canada and abroad. Global tech giants and some Canadian start-ups compete to provide direct-to-consumer PHC solutions, which are publicly funded in leading provinces but funded by out-of-pocket expenditure and private insurance elsewhere.

### CANADIAN HEALTH SYSTEMS DESIGN

The purpose of the system is to address illness once it emerges and to limit the time that people are ill. Technology has an increasingly prominent role in most Canadians' experiences of the healthcare system and health service delivery. Across Canada, all systems have started to integrate EHRs for all residents, while leading provinces provide comprehensive digital platforms for consultations, test results, and access to general health information, supported by collaborations between tech giants and life science companies. New roles, such as health system navigators and data managers, have also emerged, highlighting the need for purposeful collaboration between professionals from different disciplines and across borders. Moreover, the private sector and patient organizations lobby intensively to improve conditions for data sharing so that their rich troves of health and health relevant data can be applied, but their success varies across locations. Wide-ranging concerns about the implications of the commodification of personal data mark the largest obstacle to this initiative. However, several specialist clinics across Canada participated in a successful 2029 cross-border data-sharing pilot, supported by partners such as the Canadian Personalized Healthcare Innovation Network and Canada Health Infoway, with the aim of developing a pan-Canadian model. Provinces & territories engaging in PHC are beginning to develop specialized care models that emphasize early diagnosis and use coherent care teams to broaden the scope and impact of treatment services.

Private corporate insurance plans have begun to offer personalized technology platforms and services to improve patient experiences and the efficiency of the healthcare system, which aligns with the prevailing, treatment-oriented approach to care. The varied pace of development in PHC is also reflected among the healthcare workforce: leading provinces & territories offer numerous incentives for upskilling such as paid leave, course tuition credits, and grants to take full advantage of new technologies and gain new knowledge. There is also an emphasis on digital literacy in training curricula here.

### CANADIAN CITIZENS AND PATIENTS

While the primary goal of Canada's health systems is to provide high-quality treatment overall, leading provinces and territories have invested resources in improving health and digital literacy among citizens and have introduced targeted measures to address social determinants of health among vulnerable populations. The aim is to support Canadians to maintain their health by providing them with the tools and resources to easily access and navigate the health system and improve early detection of disease. Diverse regulatory approaches to health data have led to equally diverse attitudes about sharing data. Certain provinces & territories have been hesitant to engage with private partners as the benefits of sharing data are unclear and there is scepticism about sharing personal health data outside the public system. Other provinces have crafted regulations to ensure that individuals are the primary beneficiaries of any data-sharing activities. This has not only increased willingness among citizens to share data, but also increased accountability of public and private players. Across Canada, attitudes about sharing non-health-related information such as social media data are largely influenced by individual assessments of convenience and security.



# Scenario D

LABORATORIES FOR PERSONALIZED MEDICINE



## BENEFITS & PITFALLS

### BENEFITS OF THIS SCENARIO

- Increased freedom to experiment with PHC solutions and collaborate with new partners
- Faster scaling up in innovation-friendly jurisdictions
- Broader range of health services made available by private players

### PITFALLS OF THIS SCENARIO

- Geographical and social inequities in access to and quality of care
- Potential for commodification of personal information (perverse incentives for some actors)
- Exacerbated information asymmetries and unhealthy competition between public and private sectors

## MUST-WIN BATTLES

Combat inequities in health outcomes and literacy that arise through different approaches to PHC financing, implementation, and regulation

### FEDERAL LEVEL

- Ensure scalability of new solutions, especially home-grown ones
- Reduce barriers to entry and create pathways for solutions to be widely available

### PROVINCIAL LEVEL

- Maximize regional alliances
- Promote regional excellence via incubators

### INDUSTRY LEVEL

- Support and actively participate in regional excellence hubs
- Develop a symbiotic relationship between academia and industry

### SOCIETAL LEVEL

- Define health data as a public asset to balance public and private interests and value for citizens
- Define and solve privacy and consent issues



## 4. From Scenarios to Actions



# FROM SCENARIOS TO ACTIONS

## WHY WE NEED TO CHANGE THE WAYS WE THINK ABOUT HEALTH.

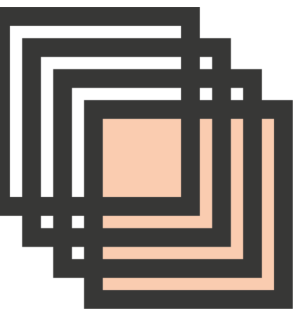
The current health system in Canada, and in the rest of the world, is broken due to the prevailing 20<sup>th</sup> century focus on disease, with expensive and inefficient treatments late in patient journeys. This presents the ultimate challenge in modern healthcare: lack of preventive efforts to maintain health alongside treatments for those in need. There is a necessity to frame and enable a new sustainable health paradigm with a focus on personal outcomes rather than system output. As a country, Canada has a significant role to play in shaping this new paradigm based on a fair and inclusive healthcare model with strongholds in both research, AI, genomics, and private sector innovation.

While technological development is part of maturing personalized health, so are governance and strategies in which the technology operates is of paramount importance. For example, personalized health needs volumes of data to develop deeper understandings of health, disease, early interventions, and to optimize treatments. Attempting this feat for single provinces and territories might prove insurmountable, but Canada represents a population of approximately 37 million people. By leveraging the strength of this sizeable and uniquely diverse population, it is possible to start envisioning and developing the personalized health paradigm.

To increase citizens' responsibility in minimizing avoidable disease burden, investments in health and digital literacies are essential. Empowering citizens and communicating the benefits of applying the troves of publicly available information to individual health experiences can reduce reliance upon doctors as advisors. This presents comprehensive tasks for the Canadian health system. First and foremost, the perception of health data needs to shift. Viewing health data as a public asset will balance public and private interests and increase the real and perceived value for citizens. This will require increased transparency, traceability, and accountability in data application to address citizen concerns on privacy and consent related issues.

Additionally, harmonizing provincial legislation can increase multi-layered trust among citizens, organizations, and companies and achieve enhanced interoperability across the country. While provincial and territorial governments can provide health services autonomously and according to the local needs and circumstances. This effort is a question about how to ensure equity and access to the best possible care, with an emphasis on providing better health and care for the weakest and underserved. The route to the personalized health paradigm could be an inter-provincial and federal agreement on universal governance concepts like 'Health in all Policies', 'Leaving no one Behind', 'One Health', 'SDG 3 (Health & Wellbeing)', building upon Canada's long tradition of 'Social Determinants of Health'. To combine these efforts and enable an economy of wellbeing, standards and technical interoperability are necessary.

In the following pages, we build upon the must-win battles identified in each scenario and develop an actionable roadmap to realize PHC in Canada. These actions are fruitful and essential to further PHC, regardless of how the Canadian landscape develops. With these words, we ask you to realistically examine the core elements that need to be addressed across Canada to build an equitable future. Be a policymaker for humanity that asks, *what can you do toward 2030 and 2050, starting tomorrow?*



# ACTIONABLE ROADMAP

## OPPORTUNITIES AND CHALLENGES TO REALIZE PHC IN CANADA

### Engage in long-term planning for personalized health

**Why:** Sustainable solutions for personalized healthcare require long-term planning that can operate outside of the constraints that short-term political cycles place on vision building and resource allocation.

#### **Actions**

**Federal:** Major stakeholder groups and decision-makers on the federal level can align on a set of goalposts over ten years for achieving PHC. The goalposts should articulate a vision for a common Canadian direction towards PHC and affirm targets, but not means for reaching them, and support the efforts of provinces and territories to develop tailored solutions and policies when and where needed.

**Provincial:** Provinces and territories can select two related areas for specialization in PHC over the long term: a specific disease area and specific technology. Provinces can also support start-ups aligned with this focus by providing the necessary infrastructure to overcome initial hurdles (for example, provide grants and tax breaks), and develop initiatives to attract from Canada and abroad.

**Industry:** Industry can work to increase its role, responsibilities, and leadership in healthcare, developing concrete, outcome-oriented plans to engage with and develop solutions for either specific patient groups or bottlenecks within the healthcare system.

#### **Call to action**

Develop and contribute to a robust, ten-year plan for PHC in Canada.

### Invest in digital connectivity and infrastructure

**Why:** Disparities in digital infrastructure, e.g., basic telecommunications, internet access, and Internet of Things (IoT) infrastructure, could increasingly contribute to inequities in health access and outcomes as health services become more digitized. In addition, connectivity between devices, digital architectures, and care providers are crucial to the successful delivery of PHC even where access itself is not an issue. At the same time, enabling access to and the freest possible flow of health and health-relevant data such as behavioural and socioeconomic data is fundamental to building and delivering insights that both improve public and private services as well as health outcomes for individuals.

#### **Actions**

**Federal:** Ensure that the Canadian telecommunications infrastructure reflects the state of the art and expand coverage to Canada's many remote regions. Greater coverage could be supported by public subsidies for expansion to remote areas that would otherwise be unattractive to telecom operators.

**Provincial:** Provinces and territories can help by identifying and prioritizing local communications and connectivity needs, supplying the local knowledge required to build a fit-for-purpose infrastructure.

**Industry:** Major industry players could establish working groups to identify connectivity needs and opportunities for PHC and build solutions driven by both private and public-private partnerships.

#### **Call to action**

Identify and boost infrastructure investment for areas most in need of improved connectivity and lay the groundwork for improved interoperability across provincial and international borders, systems, and devices.



# ACTIONABLE ROADMAP

## OPPORTUNITIES AND CHALLENGES TO REALIZE PHC IN CANADA

### Support and scale up new PHC solutions

**Why:** Taking advantage of PHC solutions requires that they are available across Canada, so Canadians can enjoy the benefit of PHC and demand these solutions for themselves. By having access to information related to an individual's health needs at the time of diagnosis and throughout their healthcare journey, there is an opportunity for them to receive the right intervention or support at the right time and to optimize the use of resources in the healthcare system so that they receive the best possible care.

#### **Actions**

**Federal:** through public block transfers the federal government can incentivize the provinces and territories as well as universities and major innovation hubs to develop expertise in specific areas of PHC of their choosing to build a robust portfolio of competencies.

**Provincial:** The provincial governments could allocate additional resources to supporting research and development in PHC, streamline processes for innovators to secure funding, and develop mechanisms for testing new personalized health solutions with an emphasis on keeping Canadian innovators within Canada.

**Industry:** building upon credible innovations, private players can implement PHC solutions across Canada. Successful implementation provides a launch pad for subsequent roll-outs.

**Call to action:** Consider if there are additional mechanisms that ensure that solutions with the best potential can be tested, implemented, and scaled up. Examples of possible solutions include genomics, AI, data enhancement and remote monitoring.

### Build roles, responsibility & leadership in health

**Why:** Government, industry, healthcare professionals, and other healthcare system stakeholders demonstrating a clear interest in addressing pain points in the Canadian healthcare system should work to identify where each can provide leadership and accelerate access to the best possible care for people and patients. By delineating clear roles and responsibilities, stakeholders can identify where they can provide most value to both health systems and individuals either independently or in partnership with one another.

#### **Actions**

**Federal:** Regulators could level the playing field for private actors with an intent to enter the health space and create streamlined access and scaling pathways for effective solutions. The implementation of accountability mechanisms would also engender trust between healthcare professionals and Canadians.

**Provincial:** Identify start-ups, universities, etc., who would benefit from partnerships with the private sector and create incentives for private players to partner with them.

**Industry:** Attempt to address inefficiencies and bottlenecks within the healthcare system. For example, scalable IT solutions for hospitals addresses a clear challenge related to digital infrastructures. Another example is developing a platform connecting patients with rare diseases who constantly struggle with access to information.

**Call to action:** Identify the solutions with the greatest benefit to Canadian healthcare and Canadians. Industry can participate in solutions such as participating in the health and wellness space or sharing data with citizens to help them manage their health.



# ACTIONABLE ROADMAP

## OPPORTUNITIES AND CHALLENGES TO REALIZE PHC IN CANADA

### Promote regional excellence through alliances

**Why:** Regional alliances might be the most effective and efficient way to foster regional excellence in personalized health. A regional perspective ensures that local idiosyncrasies are understood, and local needs and demands are taken into consideration, while leveraging the experiences of other jurisdictions who are at different stages of a journey towards a healthcare system that provides the best personalized health options for citizens.

#### **Actions**

**Federal:** Incentivizing cross-border collaboration will not only break down siloes but ensure that provinces & territories are aligned with the overall federal approach towards maintaining health.

**Provincial:** Building upon pre-existing relationships, shared values and aligned goals, provincial leaders can identify most salient challenges to tackle in a regional settings. Regional efforts in addressing challenges such as digital infrastructures, connectivity, interoperability, standards, etc. could pave the way for pan-Canadian solutions.

**Industry:** Through partnerships with regional alliances, private players can identify the areas where Canada is poised to be a world leader or fast follower as well as other areas where solutions will be adopted in Canada.

#### **Call to action**

All regions prioritize 1-3 cross-province collaborations around implementation of personalized health, wellness or prevention approaches to healthcare.

### Support education & training for PHC

**Why:** Siloed learning leads to siloed thinking, actions, and solutions. More holistic approaches to education are needed, as PHC requires learning, thinking, and working across borders and disciplines. As technology continues to advance, a constant learner's mentality for leaders or learning health system approach in jurisdictions is critical.

#### **Actions**

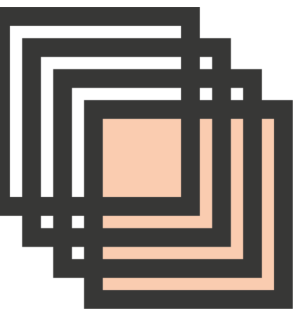
**Federal:** Develop a standardized approach to core concepts such as the social determinants of health and the "health in all policies" approach to enable health professionals to include factors such as social, economic and political factors in their treatment of and support for Canadians.

**Provincial:** Provinces can support students and working professionals to develop specializations in line with provincial areas of excellence. For example, educational programmes with an emphasis on the growing relationship between data and biology give healthcare professionals the means to continually improve their competences. These efforts can also address the disparities and knowledge gaps between provinces.

**Industry:** Private players can support lifelong learning efforts by offering initiatives where new technologies are accompanied by comprehensive on-the-job training.

#### **Call to action**

Incentivize interdisciplinary and life-long learning in areas that support PHC on the university level, in continuing education programs and in the healthcare system itself.



# Framing Personalized Health for Canadians

## THE 'PERSON' IN PERSONALIZED

### **Canadians'** access to data

Canadians should be given access to all relevant personal information – including health data – that the public sector uses to provide services to them. A clearly defined right to access such information could help drive demand for increased data sharing and interoperability as Canadians may want this information. Information that is stored disparately or locked into certain institutions needs to be aggregated in a single, easily accessible location.

From a strictly PHC perspective, giving Canadians' access to their personal data also provides the potential to more closely connect Canadians to their care providers and assume a larger role in their interactions with the healthcare system.

By giving individuals rights to their own data in a usable format, all health providers would need to apply to some form of openness and interoperability, which in this way opens for a bottom-up push.

### **Removing 'care' from personalized healthcare**

While the provision of treatment services when needed is of course crucial, and personalized healthcare offers much in the way of personalized medical interventions, personalization also entails services for monitoring and maintaining a high level of health and wellbeing. Shifting the primary focus of healthcare systems away from simply providing treatment for the sick to also providing health services for the healthy presents an opportunity for health systems to become more central and unifying elements of societies.

Building health systems that emphasize maintenance of health may provide more ways for Canadians to interact with and benefit from the healthcare system, as well as offer a platform from which Canadians could more clearly articulate their health needs and demands.

This refocus gives part of the responsibility of healthcare to the citizen. However, it does require access to data in a valid and usable format. In turn, this refocus can solve challenges such as reducing avoidable disease where prevention and early detection is possible, e.g. for lifestyle diseases.

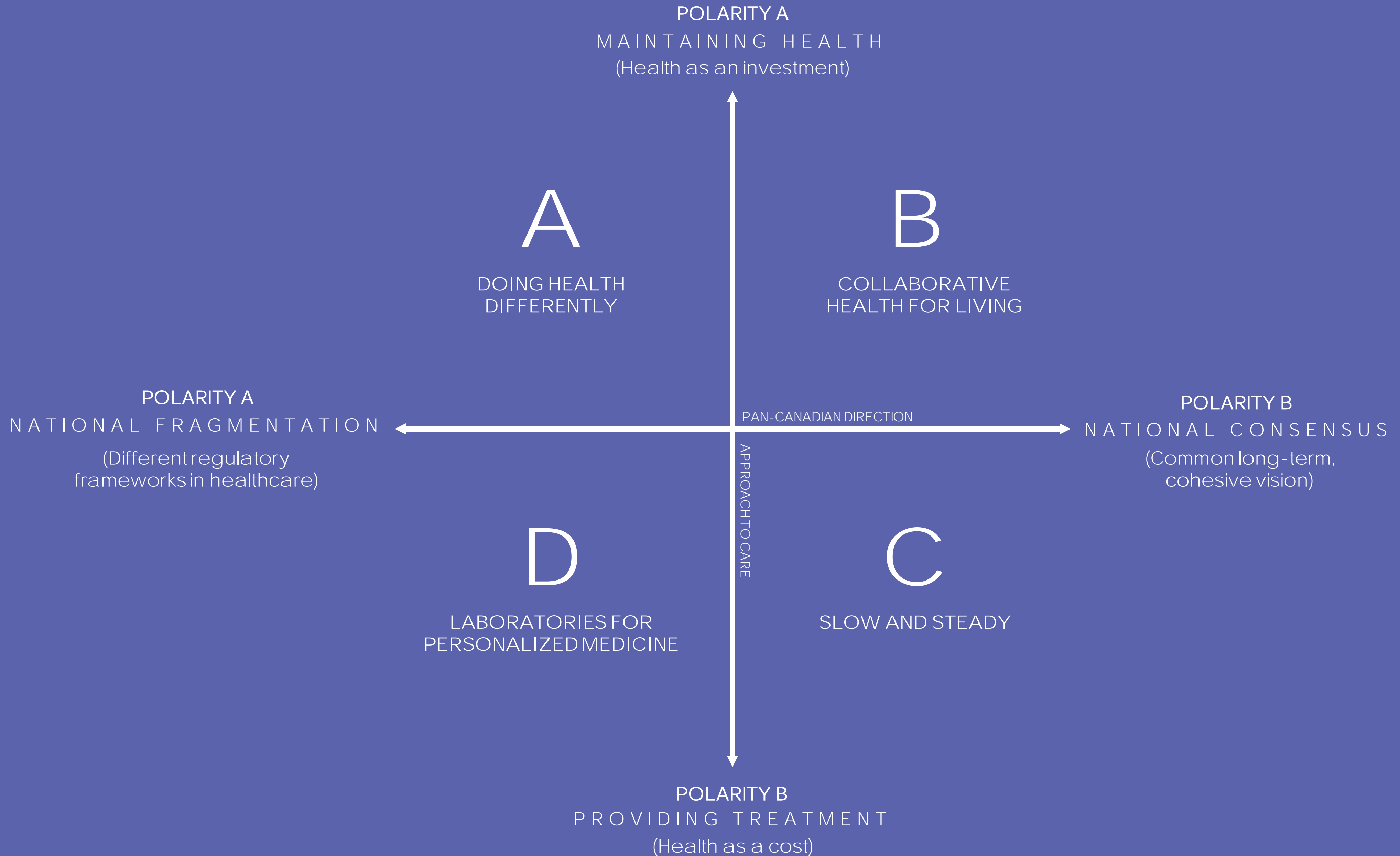
### Indigenous **peoples'** role in the future of health

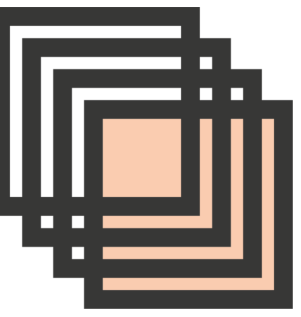
A pan-Canadian risk-sharing model alone is not enough to support indigenous peoples in Canada. Solving indigenous health challenges requires a social determinants of health approach built on dignity and respect for distinct histories, values, cultures, and needs. If these groups are underserved, then it is likely that the weakest groups in other parts of Canadian society are underserved. Conditions and experiences of indigenous peoples can be seen as early warning signs of health system needs and failures.

This approach provides a model for an all-inclusive approach to health supported by concepts like One Health, Leaving No One Behind, Health in All Policies, which can realize Canada's leading work on social determinants of health. This also establishes an all-inclusive economy of wellbeing, where the emphasis is on lifting standards for all in need, both individually and on the community level.



# 5. Deep Dive





# Axis Descriptions

## EXPLANATION OF THE POLARITIES

### Vertical Axis: APPROACH TO CARE

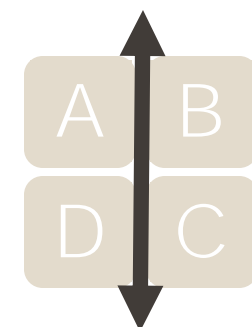
This axis describes the underlying logic and prioritization within the healthcare system. It covers the following questions: What actions lie within the purview of the health system, how are healthcare professionals and providers reimbursed and incentivized for their efforts, and what is the role of citizens/patients?

#### Polarity A: Maintaining health (as an Investment)

The purview of health extends beyond treatment of diseases and include aspects such as prevention, treatment, and early detection. There is greater continuity of care for citizens – not just patients – as there is a cradle-to-grave approach. Reimbursement follows maintenance of health and support for positive outcomes. Citizens are active in managing their own health and often use tech-based solutions to monitor health.

#### Polarity B: Providing treatment (as a cost)

The healthcare system strives towards providing high-quality treatment. Interventions occur when the citizen is recognized as a patient and has an ailment that requires treatment. Reimbursement follows provision of services regardless of outcome. Patients recognize the value of universal access and utilize healthcare services when facing a problem.



### Horizontal Axis: PAN - CANADIAN DIRECTION

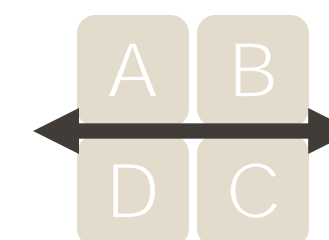
This axis is a characterization of how Canada works between and across layers of government, jurisdictions and stakeholder groups. In addition to formal legal structures, this axis also addresses modes of working that are not strictly within official channels.

#### Polarity A: National fragmentation

Provinces act autonomously and have adopted a fragmented approach, as it allows the possibility of developing local and targeted solutions on an as-needed basis. The desire to innovate is seen as being more important than broad collaboration, which means that achieving collaboration across jurisdictions can be challenging. Private, public, local, and international systems compete to provide the best solutions and services.

#### Polarity B: National consensus

Political guidelines have been characterized by the desire to find long-term sustainable solutions. There is greater cohesion and stronger ad-hoc frameworks driven forward by a broad pan-Canadian coalition for building common policy visions and concerted action. Organizations such as Genome Canada, patient organizations, and other Pan-Canadian organizations drive the long-term vision. A common long-term goal has been identified and strides are being made.



# Scenario Grid

COMPARE-AND-CONTRAST, LINE-ITEM DETAIL ACROSS ALL 4 SCENARIOS



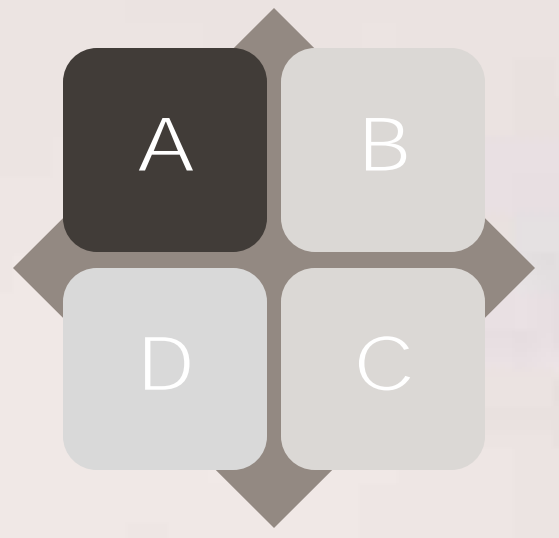
	Scenario A Doing health differently	Scenario B Collaborative health for living	Scenario C Slow & steady	Scenario D Laboratories for personalized medicine
<b>Political landscape</b>	<ul style="list-style-type: none"> <li>Federal investment towards prevention</li> <li>Provinces spend budgets autonomously</li> <li>Varying development trajectories</li> </ul>	<ul style="list-style-type: none"> <li>Ambitious federal goals</li> <li>Strong incentives for collaboration</li> <li>Widespread health promotion &amp; education</li> </ul>	<ul style="list-style-type: none"> <li>Political &amp; industrial coalition influential</li> <li>Personalized medicine scaled up</li> <li>Provincial leadership drive changes</li> </ul>	<ul style="list-style-type: none"> <li>Lack of comprehensive national plan</li> <li>Federal support provided to provinces</li> <li>Risk-averse approach to PHC</li> </ul>
<b>Incentives &amp; reimbursements</b>	<ul style="list-style-type: none"> <li>Capitation main model of reimbursement</li> <li>Treatment &amp; prevention reimbursed</li> <li>Private sector incentivized to develop solutions</li> </ul>	<ul style="list-style-type: none"> <li>Value-based reimbursement models</li> <li>Capitation aims to maximize outcomes</li> <li>Cross-jurisdictional collaboration incentivized</li> </ul>	<ul style="list-style-type: none"> <li>Care teams reimbursed in multiple models</li> <li>Pay-for-performance for care teams</li> <li>Patient reported outcomes gauge value</li> </ul>	<ul style="list-style-type: none"> <li>Fee-for-service;</li> <li>Outputs are primary metric of evaluation</li> <li>Risk-aversion incentivized in some provinces</li> </ul>
<b>Technical interoperability</b>	<ul style="list-style-type: none"> <li>On-going efforts for universal access</li> <li>Tech giants work on remote areas</li> <li>Resilient society over economic recovery</li> </ul>	<ul style="list-style-type: none"> <li>Interoperability largely achieved</li> <li>Harmonization of citizen data achieved</li> <li>PPPs drive rapid development pace</li> </ul>	<ul style="list-style-type: none"> <li>Pan-Canadian org. drive interoperability</li> <li>Rural areas sometimes left behind</li> <li>Public-private efforts to develop solutions</li> </ul>	<ul style="list-style-type: none"> <li>Piecemeal approach to interoperability</li> <li>Some jurisdictions fund rural infrastructure</li> <li>Market demands drive new solutions</li> </ul>
<b>Emerging technologies</b>	<ul style="list-style-type: none"> <li>Varying trajectories of clinical application AI</li> <li>Leading provinces utilize multi-omics</li> <li>Citizens utilize wearables &amp; digital tools</li> </ul>	<ul style="list-style-type: none"> <li>Digital twins become standard offering</li> <li>Digital triplets being piloted</li> <li>Digital therapeutics become standard offering</li> </ul>	<ul style="list-style-type: none"> <li>Tech, pharma &amp; diagnostics major drivers</li> <li>Federal govt. convenor of innovation</li> <li>Proof-of-pilot encouraged</li> </ul>	<ul style="list-style-type: none"> <li>Direct-to-consumer solutions by tech giants</li> <li>Digital health is universal, but quality differs</li> <li>Multi-omics are mainly confined to research</li> </ul>
<b>Workforce</b>	<ul style="list-style-type: none"> <li>SDoH part of training</li> <li>Training credits for upskilling</li> <li>Community workers part of care teams</li> </ul>	<ul style="list-style-type: none"> <li>Health promotion included in training</li> <li>Upskilling incentivized</li> <li>Health tools support physicians</li> </ul>	<ul style="list-style-type: none"> <li>CME credits for upskilling</li> <li>Medical knowledge &amp; collaboration are key</li> <li>Curing illness prioritized</li> </ul>	<ul style="list-style-type: none"> <li>Digital literacy in training curricula</li> <li>Cross-disciplinary collaboration</li> <li>New roles, health system navigators, emerge</li> </ul>
<b>Access &amp; attitudes to data sharing</b>	<ul style="list-style-type: none"> <li>Citizens take cue from regional regulations</li> <li>Citizens accept transparency &amp; reciprocity</li> <li>Personal attitudes varied</li> </ul>	<ul style="list-style-type: none"> <li>Benefits of data sharing obvious</li> <li>Privacy concerns alleviated by regulation</li> <li>Stringent requirements from private players</li> </ul>	<ul style="list-style-type: none"> <li>Supported by EHRs</li> <li>Integral part of treatment</li> <li>Reciprocity built into the system</li> </ul>	<ul style="list-style-type: none"> <li>Private sector lobby to improve conditions</li> <li>Regulations ensure individuals benefit</li> <li>Convenience &amp; safety drive choices</li> </ul>
<b>Point of care</b>	<ul style="list-style-type: none"> <li>Flexibility, community centres &amp; physicians</li> <li>Tele- &amp; remote-health on the rise</li> <li>Smartphones increasingly point of care</li> </ul>	<ul style="list-style-type: none"> <li>Smartphone apps</li> <li>Always within reach</li> <li>Beyond traditional waiting rooms</li> </ul>	<ul style="list-style-type: none"> <li>Focus on efficiency</li> <li>Mostly physician's office &amp; hospitals</li> <li>Traditional approach dominates</li> </ul>	<ul style="list-style-type: none"> <li>Patients remain within provinces for treatment</li> <li>Traditional approach dominates</li> <li>Mostly physician's office &amp; hospitals</li> </ul>

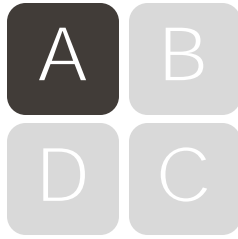
# SCENARIO A

*GLOBAL REGIONS FOR HEALTH TO REALIZE 'LEAVING NO ONE BEHIND' AS A HEALTH DRIVER'*

TITLE: DOING HEALTH DIFFERENTLY

AXES: NATIONAL FRAGMENTATION / MAINTAINING HEALTH





# Scenario A

## DOING HEALTH DIFFERENTLY



### POLITICAL LANDSCAPE

By 2030, Canada is globally recognized for its stance on maintaining health. At the federal level, in addition to the established health budget, a significant proportion of funding has been added and allocated for primary prevention, early intervention, and health promotion through education, with provincial discretion on spending. This autonomy among provinces and territories has resulted in different approaches to prevention across Canada. Some provinces have developed strong relationships with external global partners, identified as leaders in precision medicine, but with limited cross-learning within Canada. The federal government maintains an interest in the long-term vision for a healthy Canada, as demonstrated by open and liberal policy designed to support technology companies, which in turn can bolster digital health. This commitment is embraced at the community level, and despite growing differences between provinces, Canada has seen improved health outcomes in all provinces over the past decade. By letting the provinces and territories find their own solutions, the hope is to have locally optimized health systems. At the federal and provincial level, a ‘health in all policies’ mindset is increasingly prevalent and the impact on health is studied when passing legislation or examining the influence of policies.

### PAN-CANADIAN ECOSYSTEM

Industry players and public health providers drive the Canadian healthcare ecosystem. Local start-up companies are amongst the main innovators in this area, receiving government support

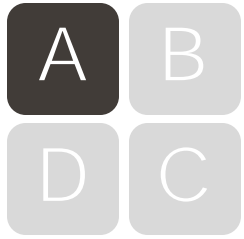
and targeted incentives to implement personalized health ideas. Lack of scalability is a by-product of fragmentation; while governments support local, community-driven PHC initiatives, their national application is limited. Technology companies entering the health ecosystem fall into two broad categories – those that specialize in selling highly customized solutions at a local level and those that aspire to provide pan-Canadian solutions, but struggle to gain traction across multiple settings. There is also a rise in public-private partnerships at the federal level to address the challenge of scalability. Established insurance providers such as Manulife Financial have partnered with start-ups to launch pilots in leading provinces, with the goal of a pan-Canadian rollout.

The federal government monitors local developments to identify best-practise ideas that could be implemented at a national level to reduce the gap in access to PHC across Canada. Federal efforts are also reflected in infrastructure investments to make telehealth and remote health universally accessible. Though interoperability between provinces is limited, over the past decade, technical interoperability within provinces has been achieved with a particular focus on connectivity of previously hard-to-reach populations, including indigenous peoples. Pan-Canadian organizations such as the Canadian Institute for Health Information (CIHI) & Canadian Institutes of Health Research (CIHR) engage in ongoing attempts to develop a layer of interoperability between systems, with a universal ‘switch board’ approach. The commitment within Canada varies, and hence the encouraging knowledge exchange across the

provinces and territories is a work in progress.

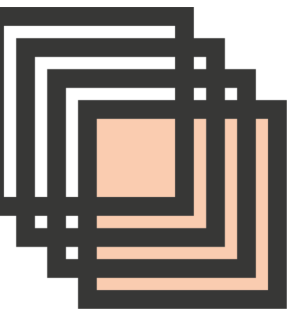
### CANADIAN HEALTH SYSTEMS DESIGN

The public health system in Canada has embraced emerging technologies to varying degrees. In leading provinces, significant aspects of support for clinical decision-making and administration are driven by AI. In lagging and middling provinces, AI is less advanced and has been adopted for administrative tasks, with continual catch-up efforts. The speed of adoption of new technologies varies across different provinces. In leading provinces, multi-omics are well-established in patient care, especially in disease screening, which leads to earlier interventions. Municipal health workers have access to multi-omics tests to assist citizens in making beneficial lifestyle changes at an earlier stage, prolonging good health by preventing or minimizing the effect of disease. In lagging provinces, the clinical utility is limited to genetic screening and sequencing and tends to focus on cancer, rare diseases, and cardiovascular health; however, even in these instances, patient experience has seen a marked improvement. There is greater public awareness for the importance of prevention and an individual’s role in steering their own health. Increasingly, municipalities, community workers, and doctors are working together to address current and future health needs. Leading provinces benefit from the autonomy and pace of implementation within their jurisdiction, tailoring new technology to specific local needs. However, an ‘every jurisdiction for themselves’ attitude runs the risk of provinces and territories with smaller and less developed health systems getting left behind.



# Scenario A

## DOING HEALTH DIFFERENTLY



### CANADIAN HEALTH SYSTEMS DESIGN (contd.)

Capitation is the main model of reimbursement for family physicians and community workers, which ensures that treatment and prevention are reimbursed, over-treatment is disincentivized, and greater emphasis is placed on outcomes.

The changing approach to healthcare is reflected within the training and education provided to healthcare professionals. Social determinants of health are now a major aspect of training and no longer viewed as an auxiliary area, enabling a 'whole person' perspective for care. For example, the ability to work is a central consideration for treatment and rehabilitation.

The fragmented landscape prevents sharing data and learnings between regions, resulting in a lack of evidence to validate specific approaches or learn from previous failures. For example, though there is an ambition to deliver virtual care across Canada where any available doctor can address a patient's concerns and write a prescription if required, several bureaucratic hurdles such as lack of coordination regarding reimbursement hinder doctors' willingness to participate in pan-Canadian virtual care programs. Consequently, provinces continue along their independent paths, inevitably leading to diverging priorities.

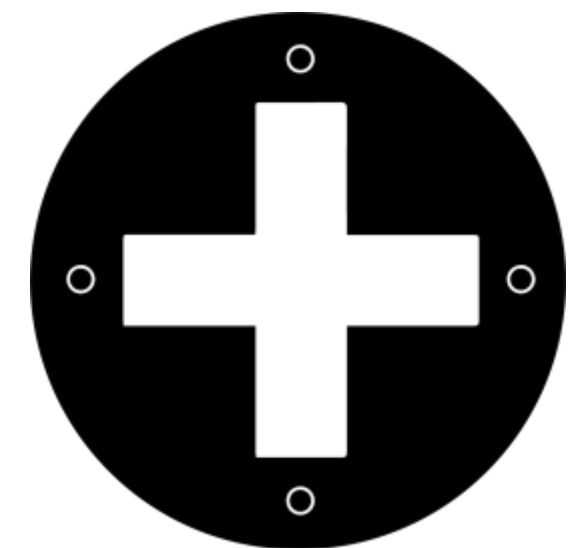
The private sector is poised to benefit from the fragmentation in the Canadian health landscape. For example, tech players partner with hospitals to provide added value through local digital functions, while insurers work with municipalities to trial tailored solutions, such as biometric screenings in public libraries and in-home check-ups for high-risk groups. Where private players try to adopt a pan-Canadian approach, in line with the

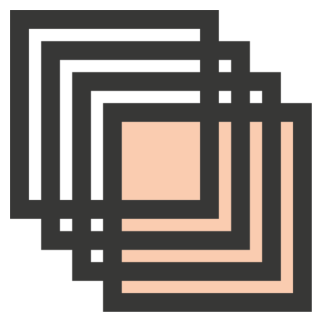
federal government's initiatives, it is often the larger provinces that attract and shape this investment. There are efforts for smaller provinces & territories to be included in pilots; however, due to the nature of investments and the required returns it is often the larger populations that are better placed to reap the early benefits.

### CANADIAN CITIZENS AND PATIENTS

By 2030, citizens embrace their role and responsibility to remain healthy. Tech savvy, digitally literate citizens demand non-clinical services, health coaches, digital tools, apps, and wearables. These devices provide a granular understanding of how to best maintain health and support in making healthy decisions throughout the day. Heavy and prolonged investment from the federal government with a focus on prevention is bearing fruit. Targeted social measures, such as sports and healthy lunches in schools, reorganization of work and public transport, and access to psychologists & social workers have instilled, especially among the younger generation, the value of a proactive and whole-life health approach. Leading provinces have their finger on the pulse and use multi-omics as early indicators of disease prior to disease development, thereby enabling earlier intervention. Unfortunately, in some provinces the response is slower, which leads to certain segments falling through the cracks. Patients with the same disease spread across Canada often struggle from a lack of collective insight and action. Federal investments level out the challenges to a degree, but the uneven access to PHC is felt strongly in these patient communities. Despite regional differences, Canadians' trust regulations and

believe their data is secure at a federal and provincial level. Tech players are held to high standards, and citizens expect a reciprocal relationship in exchange for their data, as a partner in health technology.





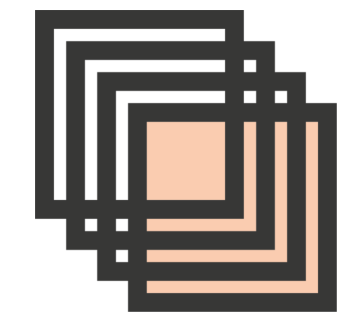
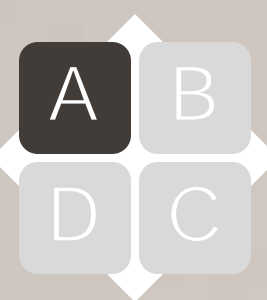
## Josh, 25: Car Accident

En route from Calgary (province of Alberta) to visit his parents in Montreal (Quebec), 25-year-old Josh has a car accident and is transported to a hospital in Thunder Bay (Ontario). The trauma team at the hospital try to access the patient's electronic medical record (EMR), so they can apply tailored, individualized medication.

The emergency care team assigned to treat Josh faces a problem in accessing basic information in Josh's EMR because he lives in a different province, which uses a different IT system.

The doctors try to contact Josh's family doctor to provide the missing data. In the meantime, they conduct all the necessary basic tests that would have been unnecessary had the EMR been accessible. The tests pick up one important detail: Josh has been suffering from anxiety and takes beta-blockers. Intervention resulting from a sudden asthma attack resulted in an unanticipated drug-drug interaction, causing more severe asthma attacks. Although the patient was not seriously injured due to the accident and could have been discharged from the hospital after a few hours, as a result of this response the doctors decide to extend his hospitalization to keep him in for observation.

Fortunately, Josh's condition is improving. Since then, Josh has kept a note in his wallet about the medications he's taking and on-going treatments to avoid a repeat of this experience in the future.



## Janet, 48: Type II Diabetes

Janet is deeply engaged in managing her health and keen to understand the best possible methods to use to improve her wellbeing. She lives in Manitoba – the province that has recently introduced a digital-driven, modern personalized health program for its citizens.

Janet has access to a health portal provided by her local municipality. She also uses wearables to continuously monitor her health, which makes management easier. She uses a mobile app and smartwatch – prescribed by her general practitioner – integrated with the local health portal and municipality. All the data are transferred automatically to her electronic health record (EHR) using the national e-health infrastructure. An AI system analyses the data to suggest lifestyle and dietary changes tailored to her health needs. Additionally, Janet’s local supermarket has joined a new pilot program which allows her to transfer her shopping list to her EHR.

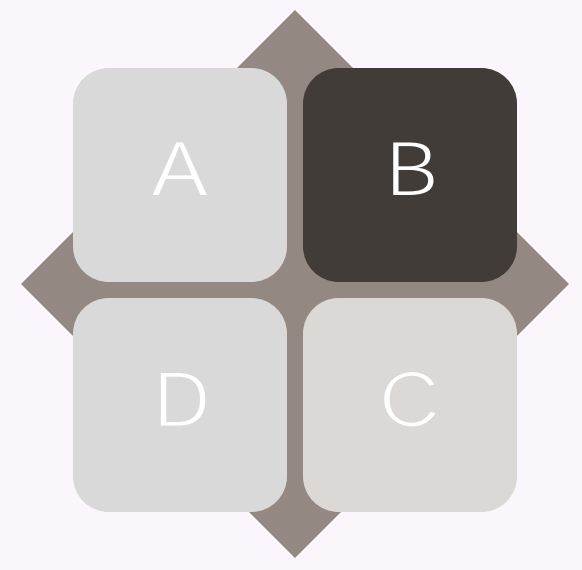
Recently, Janet has felt fatigued and has a rash. Using services offered by Molecular You, Janet aims to understand her unique biomarkers and understanding the underlying cause of her fatigue. Janet discovers certain food intolerances that are directly uploaded to her EHR. This development motivates Janet to continue her focus on well-being, with continued support from her physician and municipal health worker.

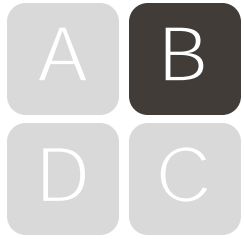
# SCENARIO B

*CANADA IS THE WORLD LEADER ON WELL-BEING AS AN ECONOMIC DRIVER*

TITLE: COLLABORATIVE HEALTH FOR LIVING

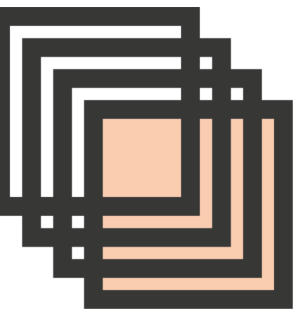
AXES: NATIONAL CONSENSUS / MAINTAINING HEALTH





# Scenario B

## COLLABORATIVE HEALTH FOR LIVING



### POLITICAL LANDSCAPE

By 2030, the concerted shift towards a wellbeing economy has helped Canada establish PHC as the mainstay of healthcare delivery. The ambitious goals set by the federal government, reinforced with strong incentives for collaboration, have allowed key stakeholders to join forces across the provinces and territories. The resulting inter-provincial consortium promotes a vision of healthcare that emphasizes prolonging health, wellbeing and preventing disease. Canada has begun to reap the rewards from its strongholds in AI and investments in key areas, including digital health infrastructures. Most notably, after a successful pilot on a federated health data system, implementation across the country has begun, adding to Canada's global competitiveness in PHC. Moreover, intensive efforts to improve early detection of disease and to foster jurisdictional cohesion through a 'health in all policies' approach has led to meaningful recognition of the social determinants of health across all areas of government and active programs to redress inequality. Widespread health promotion and targeted education has led to increased health literacy, and citizens are incentivized to act on increasingly available health data through comprehensive and intuitive digital health platforms.

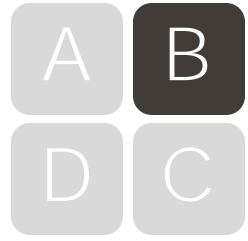
### PAN-CANADIAN ECOSYSTEM

With the move towards PHC, the public sector has acknowledged the need for private innovation, despite increasingly fierce competition in health services. New players in health operate alongside established industries, including big tech companies, life science and tech start-ups, pension funds,

and insurance companies, with a trove of personal and health-relevant data providing new opportunities to support the health system. This is particularly pronounced in the increase in preventive services and a growing market for applications to promote individual healthy living. Consequently, the role of public Canadian institutions, such as Canada Health Infoway, has expanded, accelerating the adoption of digital health solutions. This has enabled the creation of partnerships eager to exploit the success of the public-private partnerships that were so influential in combatting COVID-19 in the early 2020s. Public-private interactions have been instrumental in supporting the harmonization of citizens' health data across borders, promoting joined-up care delivery throughout Canada. This progressive agenda has met with challenges as well as advantages. With widespread consensus as the driving force in the shift to PHC, the pace of implementation and scaling of new solutions can be sluggish. To secure uniform execution across the country, different provinces require varied levels of support and adaptation to align policies and standardize processes. This has been mitigated with an agile experimentation approach – a culture of short innovation cycles with pilots and rapid accelerator programs, alongside publicly funded innovation challenges to support the start-up community to create responsive test beds for cutting edge solutions. Regular use of these innovation channels and demonstrated success along with established evaluation metrics have resulted in a more even distribution of innovators and recognition of value throughout the system, allowing different provinces and territories to play to their local strengths.

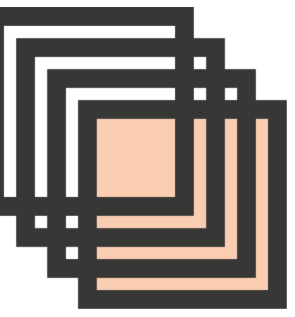
### CANADIAN HEALTH SYSTEMS DESIGN

It is common sense that healthcare needs to play a larger role in the lives of healthy citizens before they become sick, to combat the growing burden of noncommunicable and lifestyle diseases. This, however, requires systemic, cultural, and behavioural changes. To this end, new value-based reimbursement models are being implemented to shift health systems' focus from outputs to outcomes that emphasize prevention and quality of life and reward such, rather than pay based on number of pills sold. This has had the knock-on effect of reducing the tendency for overtreatment and has provided a coherent mechanism to reduce prescribing, especially if drugs are demonstrated to be ineffective. Multidisciplinary care teams (MDTs) are a fundamental unit of the healthcare system and are reimbursed via integrated capitation that aims to maximize citizens' health outcomes. The primary physicians are paid for the entirety of care for patients, including services offered by other healthcare providers, thereby enabling cross-jurisdictional collaboration. Additionally, wellbeing prescriptions have been introduced, focusing for example on time in nature, exercise, rest, and nutrition as alternative interventions to pharmaceutical products, resulting in a broadening of industry products to include digital health interventions alongside traditional drug pipelines. This has led to improvements in the trial and regulatory processes to demonstrate digital health efficacy, with the creation of trusted providers and a market for independent digital compliance and assessment teams.



# Scenario B

## COLLABORATIVE HEALTH FOR LIVING



### CANADIAN HEALTH SYSTEMS DESIGN (contd.)

Individuals are in a better position to judge which digital tools are of most benefit, guided by their MDTs. Major public institutions such as CIHI, the Public Health Agency of Canada, and Canada Health Infoway collect and distribute essential information on population health, which private institutions can access to build services and insights that benefit both individual and population health. This alignment of PHC and public health has allowed development of a learning system with insight travelling in both directions, leading to improved outcomes. Through publicly funded programmes to develop the primary prevention sector, citizens and patients are incentivized to adopt healthier lifestyles through intuitive digital personal health interfaces that include personalized features such as dietary plans tailored to individual genomic profiles and various social nudging features to encourage healthier behaviours. This is bolstered by wellbeing prescriptions to signpost areas for specific focus, and to offer advice if additional support is required. This combination of advice and autonomy empowers patients to take responsibility for their health as a broader lifestyle choice, with confidence that it will work. With the establishment of these high-quality digital therapeutics as a standard offering, the establishment of digital twins; i.e., a virtual replica of a person's biological profile, are becoming more readily available to citizens.

The next phase will be the establishment of a “digital triplet”. This is currently being piloted by three provincial innovation hubs to enable comprehensive in-silico testing of medical interventions, drawing on an individual's digital and biological phenotype to

enable personalized real-time modelling. Legislative harmonization, while a slow and demanding process, has improved flows of data, as well as access to, and portability of, care across provincial and territorial borders, further supporting modelling capabilities. These activities are bolstered by the widespread understanding that initiatives supporting personalized care and public health are mutually beneficial; an idea that was formalized by the 2027 Canadian Data Reciprocity Compact. While the exchange of data between the public and private sectors has allowed citizens and patients to gain comprehensive insights about their health and wellness both within and outside of the clinic, Canada is struggling to achieve adequate levels of health (and technical) literacy, especially among the elderly and geographically marginalized groups. The health system's increased focus on more holistic approaches to healthcare has also highlighted a need for upskilling and developing new competencies among the healthcare workforces. To address this, the provinces, territories, and federal government provide doctors and nurses with incentives to upskill, such as grants for courses, paid time off, and tax deductions for courses, for example to increase digital literacy, and use of prevention-based solutions among patients, emphasizing the importance of social determinants of health, with health promotion included in most core training programs.

### CANADIAN CITIZENS AND PATIENTS

By 2030, both citizens and the healthcare system have embraced the notion that prevention is the most powerful tool to maintain good health and wellbeing for the longest possible

time. Using technology and with increased support from the healthcare system, citizens have become empowered partners in their own health. However, for marginalized groups there are still barriers to obtaining the same level of health and digital literacy as the better-off. Achieving equity in this area is therefore a major focus for public and private actors alike, politically bolstered by the genuine recognition for health in all policies, to engage with the social determinants of health. Additional support is provided for those who need it by health coaches, digital health tools, companies that test and evaluate their efficacy, and community health workers. Most citizens are confident that the point of care is always within reach, often in the form of easily accessible smartphone apps, and are empowered to engage with their health and health-related decisions in all aspects of life. A high level of care has been made possible through access to data for the healthcare system and individuals, accompanied by a general willingness to share data, to the extent that privacy and security concerns are alleviated by regulation and trust in the key health organizations and institutions. Harmonized regulations also keep commercial players in check with strict rules for transparency, traceability, and accountability. The shift in focus to health and wellbeing can be detected in the language individuals use when discussing healthcare, with much less emphasis on disease management and treatment, and recognition of healthcare settings as more diverse and ubiquitous in the community, moving far beyond the reaches of the traditional doctor's waiting room.



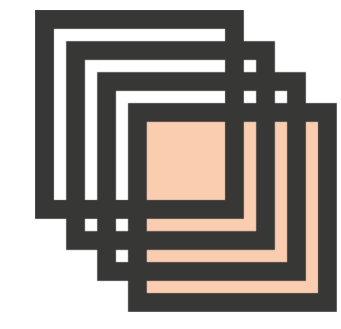
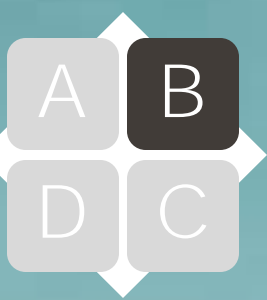
# Scenario B

COLLABORATIVE LIVING FOR HEALTH



## Ava, 39: Seasonal Flu

39-year-old Ava from Vancouver felt unwell late in the evening. Ava's smartwatch (which she received through a healthy lifestyle bonus program) is connected to a national health portal. It signals a fever of 38.5 C and a higher-than-normal rest heart rate. Her watch alerts for an initial health assessment and after a few seconds, she receives a preliminary diagnosis. With 71% probability, it's the flu, but Ava requires medical consultation. She is connected to a national telemedicine centre and allows them to access her biomarkers. The doctor asks Ava for additional tests using a digital home stethoscope, which performs throat and ear exams and ECG and measures blood oxygen. The AI correlates the data with the patient's medical history and connects with the national Health Big Database to make an evidence-based decision. With 94% probability, it is seasonal flu. To increase the precision of the diagnosis, the system connects to the population health system, detecting that Vancouver has a high seasonal flu prevalence, and many cases have been reported at the company where Ava works. The e-prescription is available in real-time in the local pharmacy, which delivers the drug within an hour directly to the patient. The company where Ava works receives an electronic discharge. Ava recovers very quickly, and despite the lack of previous flu episodes, the system enters the flu vaccination into Ava's annual schedule.



## Lawrence, 61: Depression

Lawrence, lives in a rural area in Yukon province. He has been treated for mild depression for years through a national mental telemedicine program allowing for coordinated care. A nurse from the telehealth centre contacts Lawrence regularly to consult on his condition and get direct feedback. A voice assistant provides cognitive-behaviour therapy (CBT) and analyses voice markers to spot early warning signs of deteriorating health. To monitor other biomarkers, Lawrence takes regular tests using a home diagnosis kit, while smart drug packages monitor medication adherence. A local nurse is notified if a declining health trend is observed, and care is synchronized within the local social care system. The e-mental health program includes coordinated visits by trained volunteers from the local care organization, participation in sports activities, and social activation for the over-65s. Since many employers have joined national prevention programs, Lawrence continues to work and can take advantage of remote work or extra days off when recommended.

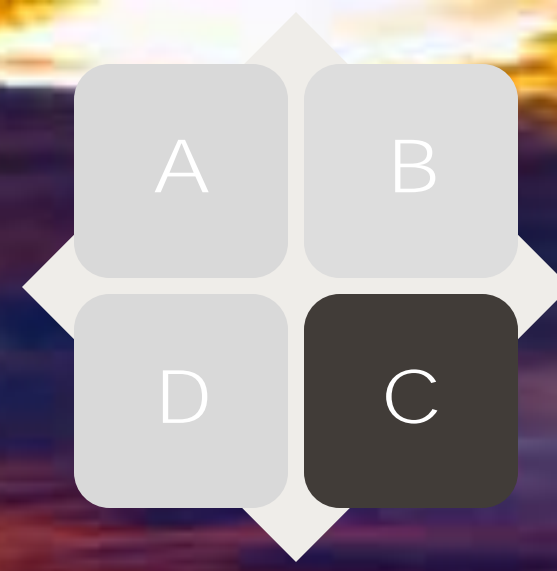
Lawrence has also decided to give his family real-time access to some of his data, keeping them apprised of health developments. Because Lawrence lives alone, in 3 years he will qualify for the “Your e-Caregiver” pilot program. This will include a new-generation AI robot companion developed to control daily behaviour and combat loneliness, especially among seniors. The robots are fully interactive and can connect with other robots to allow people to interact remotely with each other.

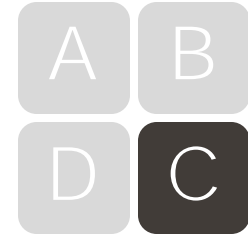
# SCENARIO C

*CANADA PERSONALIZED MEDICINE COALITION – DRIVING GLOBAL REFERENCE  
GENOMES PROGRESS*

TITLE: SLOW AND STEADY

AXES: NATIONAL CONSENSUS / PROVIDING TREATMENT





# Scenario C

## SLOW AND STEADY



### POLITICAL LANDSCAPE

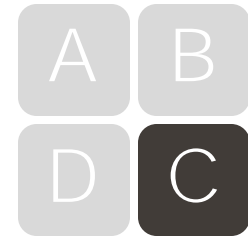
In 2030, Canada's healthcare system is globally renowned for providing its citizens with the best possible treatment. Personalized medicine is the leading paradigm and the main driver for an integrated health system – the product of a long-term political and industrial coalition after the COVID-19 pandemic. The primary goal of this coalition is to provide the same standard of care across all provinces and territories, resulted in the scaling up of cross-jurisdictional personalized medicine. Provincial and federal governments are responsible for different elements of operation, while industry players take the lead on technology. This differentiated approach has helped position Canada as an integral player within the global personalized medicine coalition and a world leader in personalized medicine. Besides the public-private partnerships arising from this coalition, societal and, most importantly, provincial leadership are at the centre of the shift to personalized medicine, capitalizing on the diversity of the Canadian population and health system and clinical data. Collaborative initiatives are formed in the western, central, and Atlantic provinces, overseen by a Pan-Canadian steering committee with one goal; to provide the same standard of care across all provinces and territories. A combination of long-term leadership at the federal, industrial, and provincial levels and collaborative leadership within the healthcare system enable integrated care across Canada.

### PAN-CANADIAN ECOSYSTEM

The healthcare industry and the public healthcare system are key players in the ecosystem. Industry focuses on creating new solutions for better treatment, while the public health system focuses on implementation. Public-private partnerships are common, following a history of successful trials and a focus on individual and societal outcomes, as well as sustainable business models. Tech, pharma, and diagnostics are major drivers of innovation, supported by the federal government whose main role is convening innovation processes. However, the role of government in innovation changes with each election cycle with a new party taking over the reins. Generally, government tenders emphasize open innovation rather than prescribing ways of solving challenges. Proof-of-concept pilots within provinces are encouraged as the first step, with successful initiatives rapidly rolled out across similar provinces and territories. Pan-Canadian organizations such as CIHI and CIHR have been granted the power to incentivize and drive interoperability across different systems. Therefore, high levels of interoperability are only hindered by limited technical infrastructure in rural areas with slow or no connectivity. To remedy this, Bell, Telus, and Rogers, with support from public funding bodies, have been collaborating with rural communities to co-develop solutions to bridge the gap between urban and rural areas.

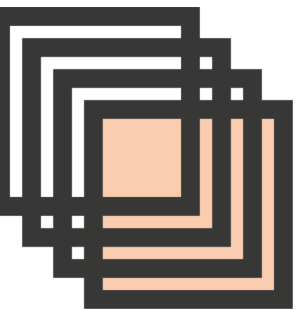
### CANADIAN HEALTH SYSTEMS DESIGN

The health system focuses on treatment of disease and secondary and tertiary prevention; i.e., early diagnosis and intervention to speed up recovery. Emerging technologies play a key role in the system and provide significant value. For example, all parents are offered whole genome sequencing for their new-borns. This aids in setting a risk score to pre-empt future illness, allowing doctors to consider the optimal treatment for each patient over their lifetime. The healthcare system concentrates on curing illness efficiently in multidisciplinary care teams to support coherent polypharmacy. In medical education, augmenting medical knowledge and effective collaboration are the most important skills that physicians, nurses, and other health workers learn. Additionally, all health workers are provided continuous medical education (CME) credits for upskilling in emerging technologies and digital health. Care teams are reimbursed in multiple models, with emphasis on providing value for patients. This has led to a system of capitation, with add-ons based on diagnosis-related groups as the main reimbursement model for the primary physician. Global budgets are the main model for the care team with add-ons in the form of pay for performance available for all members of the care team. The latter is based on patient-reported outcomes and experiences as a gauge for value provided. This focus on outcomes helps to deter over-treatment and emphasizes a coherent evidence-base with built-in monitoring.



# Scenario C

## SLOW AND STEADY



### CANADIAN HEALTH SYSTEMS DESIGN

Patients receive coherent and portable care across Canada, which leads to fewer duplications of tests, less risk of error, faster recovery from illness, and better health outcomes. A new role has been established within the system for ‘health system navigators’ who liaise with patients and support them to understand their care.

Additionally, the navigators oversee all administration, including reimbursement between different providers and members of the care team. Data sharing is recognized as an integral aspect of treatment, and reciprocity is built into the system; i.e., patients share data to improve care for all. In general, the system expects data to be shared and reused in research and in the care of others. Provinces lead the charge in agreeing to share data amongst themselves, at first for research purposes, and later for wider use, aided by the CIHI and CIHR. Data sharing is supported with an electronic health record that records consent preferences and enables integrated patient oversight, alongside targeted health and technical literacy support for patients to understand the need and use of data.

### CANADIAN CITIZENS AND PATIENTS

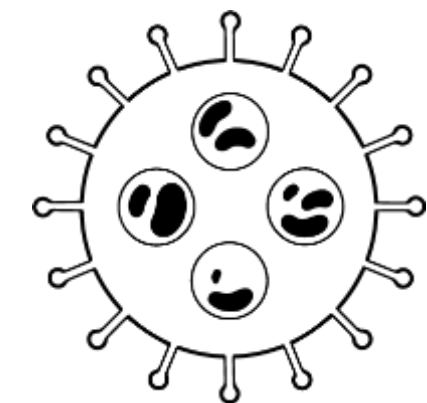
The Canadian health system mantra is to help sick people get better faster, which is generally accepted by Canadians. This is done through early detection of disease,

provision of state-of-the-art care, and monitoring after illness. The guiding principle is providing value to the patient, whether treating their disease, helping them manage it, or maintaining quality of life. People generally have a better understanding of their health and an understanding of their societal responsibility to help improve care, but geographical and socioeconomic disparities heavily influence levels of health literacy. Well-off citizens are empowered to take more responsibility of their health as tech companies help promote digital literacy on behalf of the public system.

The point of care is wherever treatment can be administered most effectively, which is still, most often, in physician’s offices or hospitals. Greater emphasis is placed on end-of-life care, with a huge cost associated with supporting an aging population, alongside an enhanced expectation for higher quality of life for longer. This has led to the development of a strong clinical evidence base and is enabled by access to data, but as governments change, so do attitudes around data. Over time it has been recognized throughout Canada that sharing data has a positive net benefit both for individuals and society.

The pace of development is slow and steady, which has given regulators the time to catch up with technological advances at varying degrees. For instance, the federal

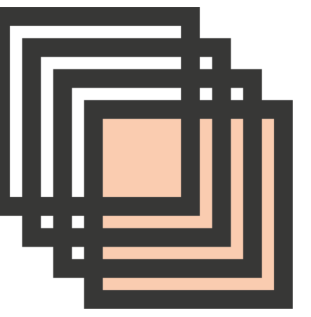
government regulates clinical data as it is deemed most sensitive, which leads to individuals feeling protected and willing to share their data with the healthcare system. There is convergence between privacy and data protection regulation, enabling individuals to access their data at their convenience. For other types of data, individuals are reliant on tech companies’ cybersecurity and privacy policies, which sometimes makes them hesitant to engage.





## Charlie, 9: Food Poisoning

Charlie is spending his summer holidays with his family in Newfoundland. During the trip, Charlie starts to feel bad, complaining of stomach pain. Diarrhoea and fever soon follow. After entering these symptoms into an AI-driven symptom checker, the parents are redirected to the central telehealth centre. Charlie's parents authorize access to the child's data so that the local doctor can check his entire medical history, including the genetic screening from birth, before they arrive. At the health centre, the EMR shows that Charlie had a similar episode three years ago, which ended after two days. Based on this data, the doctor makes a final diagnosis – food poisoning. The patient's condition is stable, so additional tests are unnecessary. The AI-based decision support system confirms that in 90% of similar cases, patients recover without extra medication within 2-3 days. Charlie's condition improves very slowly. The parents decide to see a private specialist, who performs additional stool tests suggesting that the food poisoning is a result of bacteria *C. perfringens*. The EMR confirms no episodes of allergic reactions to drugs, which allows the doctor to prescribe penicillin. The child responds quickly; however, to make sure everything is fine, the parents also opt for an expensive swallowable capsule-camera to screen the stomach and gut. The doctor calls after the examination is done – there are no signs of other digestive system diseases, and the family can continue their trip. When they return home, they receive a text message from the family doctor informing them of the need for a follow-up.



## Camilla, 43: Risk of multimorbidity

Camilla has been taking medication for hypertension and type II diabetes for years. Her body mass index (BMI) of 41 indicates obesity— and her long-term data trends show no improvements. Full genetic screening several years ago revealed an increased breast cancer risk. Camilla is at risk of multimorbidity, and all the specialist physicians who treat Camilla are included in a multidisciplinary care team, coordinating actions and setting prevention goals.

One of the goals is to help Camilla lose weight. This motivates Camilla to strictly follow the doctor's recommendations, including taking regular medication for high blood pressure and regularly showing up for a breast mammogram. She already has a few preventive health programs activated on her electronic health record (EHR), including nutrition and physical activity coaches.

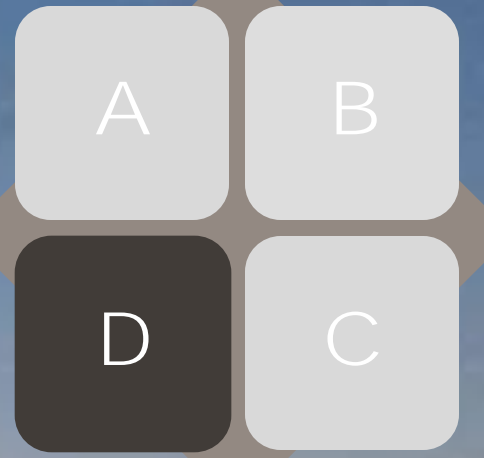
It is hard for Camilla to change her lifestyle habits. The doctor observes and reports a low therapy adherence to the provincial insurance scheme. To avoid negative points in the prevention programs activated for her, she does not enter all the data into the system and occasionally provides false data. She has already been categorised into a high-cost group in the system due to her inability to lose weight and her having abandoned her digital fitness therapy.

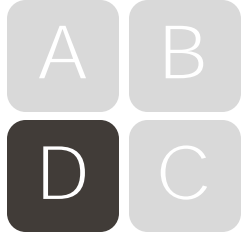
# SCENARIO D

*GLOBAL LIFE SCIENCE TEST BED WITH LEADING POCKETS OF THE FUTURE*

TITLE: LABORATORIES FOR PERSONALIZED MEDICINE

AXES: NATIONAL FRAGMENTATION / PROVIDING TREATMENT





# Scenario D

## LABORATORIES FOR PERSONALIZED MEDICINE



### POLITICAL LANDSCAPE

By 2030, continued fragmentation between the provinces & territories and a prolonged risk-averse approach to providing treatment has led to uneven development of PHC. In the absence of a comprehensive national plan, although supported by federal resources, leading provinces & territories – sometimes in regional collaborations – have developed personalized care models and solutions. This has given rise to globally recognized centres of excellence in PHC, which have leveraged existing Canadian strengths such as AI and genomics to build local, regional, and international partnerships, while other provinces risk lagging behind. New approaches to personalized care are shared quickly between collaborating stakeholders but are slow to permeate provincial and territorial borders.

### PAN-CANADIAN ECOSYSTEM

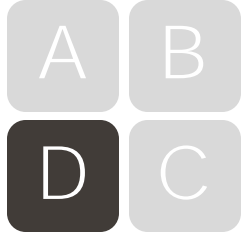
Differences in regulation between the provinces & territories have become pronounced following the 2026 Provincial Personalized Health Priority Act, which incentivizes provinces and territories to build capacities in PHC but does not stipulate how to achieve the goal. Rather than promoting standardization and coherence,

this has further fragmented healthcare delivery, leading to discrepancies in the quality of care experienced by Canadians. It has also had mixed results for industry, as different provinces & territories have taken both protectionist and free market approaches, leading to complex variations that are difficult for industry to navigate at a national level. Although the market is fragmented in Canada, various constellations of industry, patient organizations, and interest groups have set out to establish cross-border and multi-disciplinary collaborations to harmonize approaches to PHC and allow national implementation of new healthcare solutions. Notably, these coalitions have been successful in helping leading provinces & territories to adopt international standards that further drive research, innovation, and technical interoperability as well as build partnerships with public and private frontrunners, both within Canada and abroad. Global tech giants and some Canadian start-ups compete to provide direct-to-consumer PHC solutions, which are publicly funded in leading provinces, but are funded by out-of-pocket expenditure and private insurance elsewhere. Moreover, some provinces & territories, particularly those with significant budget constraints and less developed health sectors, are eager to engage in pan-Canadian

and regional collaborations to gain a foothold in PHC. The largest and most established provinces & territories are more hesitant to engage in collaborative activities and occasionally experience fragmentation and competition for resources within their own borders.

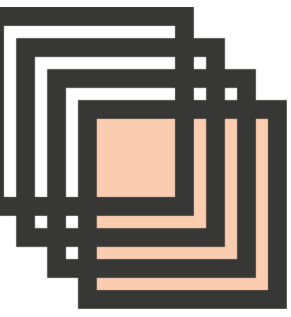
### CANADIAN HEALTH SYSTEMS DESIGN

The purpose of the system is to address illness once it emerges and to limit the time that people are ill. Technology has an increasingly prominent role in most Canadians' experiences of the healthcare system and health service delivery. Across Canada, all systems have started to integrate EHRs for all residents, while leading provinces provide comprehensive digital platforms for consultations, test results, and access to general health information, supported by collaborations between tech giants and life science companies. New roles such as health system navigators and data managers have also emerged, highlighting the need for purposeful collaboration between professionals from different disciplines and across borders. Moreover, the private sector and patient organizations lobby intensively to improve conditions for data sharing so that their rich trove of health, and health relevant, data can be applied, but their success varies across locations.



# Scenario D

## LABORATORIES FOR PERSONALIZED MEDICINE



### CANADIAN HEALTH SYSTEMS DESIGN (contd.)

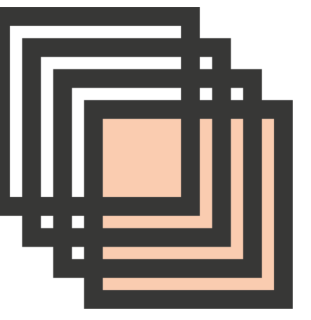
Wide-ranging concerns about the implications of the commodification of personal data mark the largest obstacle to this initiative. However, several specialist clinics across Canada participated in a successful 2029 cross-border data-sharing pilot, supported by partners such as the Canadian Personalized Healthcare Innovation Network and Canada Health Infoway, with the aim of developing a pan-Canadian model. Provinces & territories engaging in PHC are beginning to develop specialized care models that emphasize early diagnosis and use coherent care teams to broaden the scope and impact of treatment services.

Private corporate insurance plans have begun to offer personalized technology platforms and services to improve patient experiences and the efficiency of the healthcare system, which aligns with the prevailing, treatment-oriented approach to care. The varied pace of development in PHC is also reflected among the healthcare workforce: leading provinces & territories offer numerous incentives for upskilling such as paid leave, course tuition credits, and grants to take full advantage of new technologies and gain new knowledge. There is also an emphasis on digital literacy in training curricula here.

### CANADIAN CITIZENS AND PATIENTS

While the primary goal of Canada's health systems is to provide high-quality treatment overall, leading provinces and territories have invested resources in improving health and digital literacy among citizens and introduced targeted measures to address social determinants of health among vulnerable populations. The aim is to support Canadians to maintain their health by providing them with the tools and resources to easily access and navigate the health system and improve early detection of disease. Diverse regulatory approaches to health data have led to equally diverse attitudes about sharing data. Certain provinces & territories have been hesitant to engage with private partners as the benefits of sharing data are unclear and there is scepticism about sharing personal health data outside the public system. Other provinces have crafted regulations to ensure that individuals are the primary beneficiaries of any data-sharing activities. This has not only increased willingness among citizens to share data, but also increased accountability of public and private players. Across Canada, attitudes about sharing non-health-related information such as social media data are largely influenced by individual assessments of convenience and security.

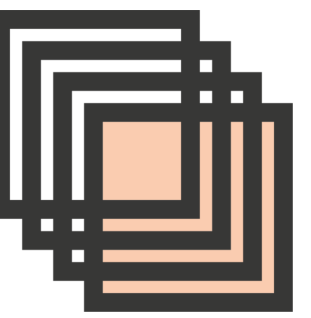




## Gaëlle, 54: Fractured Arm

While whale watching with a group of tourists in New Brunswick, Gaëlle, a tour guide living in New Richmond (Quebec), slipped on the ship's deck. She broke her arm and was taken to the nearest hospital. Gaëlle had to fill out many questionnaires regarding medical history and health insurance. Gaëlle has concerns about the reimbursement of the health services provided. Further treatment needs to be continued by the family doctor, but the doctor has problems with data synchronization, and Gaëlle has to schedule another appointment. During the second visit, the doctor decides to consult with a fracture specialist from an orthopedic centre in Toronto. The specialist can use a lighter, modern cast, which will allow greater mobility and is equipped with sensors that monitor skin humidity and other biomarkers. Gaëlle's doctor needs to confirm that the RAMQ will provide reimbursement for out-of-province costs. Fortunately, the costs are covered, as an individualized cast will allow Gaëlle to continue working. She travels to Toronto for a 3D scan and fitting. The integrated sensor monitors the bone fraction healing process, and a mobile app visualizes progress and predicts how long rehabilitation will take.

A few days later, Gaëlle receives a letter from the RAMQ informing her that she will be charged 300 CAD for the ambulance transportation to the hospital in New Brunswick. However, after several phone calls and an exchange of emails, the case was clarified, and the insurer agrees to cover the total cost of treatment in another province. Gaëlle is frustrated by the variation in rules and regulations across regions. Once Gaëlle's cast is removed, she is automatically prescribed a personalized rehabilitation program to continue physiotherapy.



## Richard, 72: Stroke

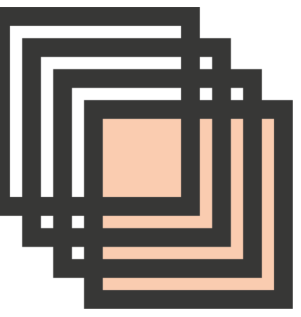
Richard moved from Toronto to Whatì, Northwest Territories, after his retirement. He is 72 years old and was diagnosed with an arrhythmia 21 years ago; therefore, he has access to the territory's 65+ cardiac health monitoring program. Since he received a new generation smartwatch from his family, Richard no longer has to manually enter data into his EHR—the manufacturer of the wearable, a big tech company, already cooperates with certain provincial and territorial health systems, which enables measurements to be transferred directly to the EHR. The heart monitoring system allows Richard to monitor his health status, while his son receives an alarm if the smartwatch detects ECG abnormalities.

Unfortunately, one day Richard feels weak and collapses at home. The watch alerts emergency services — the diagnosis is a stroke. The emergency team checks his medical records in the ambulance. The smartwatch enables the paramedics to connect with the son and update him on Richard's condition.

Luckily, Richard's condition improves. However, Richard's family is worried and wants to improve his health monitoring, as he appears to be showing the first signs of dementia. They buy a smart mirror to monitor biomarkers associated with arrhythmia and subscribe to a private "Healthy Ageing" 24/7 monitoring program. With Richard's permission, his son activates a dedicated option in the voice assistant to monitor his father's daily behavior.



# 6. Methodology and Process



# Scenario Methodology

## WHY AND HOW WE MAKE SCENARIOS

We develop and use scenarios to unearth changes and hidden dynamics and to use these insights to achieve a foundation for better informed decisions and sustainable solutions to challenges we face. Scenarios allow stakeholders to jointly break through an array of both mental and physical barriers and help us realize how alternative developments can unfold or impact the future. This makes scenarios extremely effective at opening new horizons, strengthening leadership, and enabling strategic decisions. It is important to notice that we don't make scenarios as a means to predict. Scenarios are imaginary snapshots that envision possible futures. The diversity of scenarios offers flexibility suitable for different tasks. With a visionary process like Canada Health 2030, it is important to acknowledge that the process requires a genuine interest in considering the future and a preparedness to confront flawed assumptions about it for the scenarios to lead to meaningful actions.

## THE COPENHAGEN METHOD

The Copenhagen Institute for Futures Studies (CIFS) has developed a customized engagement model around scenario planning and strategy development, known as

The Copenhagen Method. This approach is grounded in the use of various foresight and futures studies methodologies and tools as well as over 50 years of experience. While the specific methodologies and tools vary from case to case, The Copenhagen Method always includes the following elements:

### ANALYSIS OF MEGATRENDS AND THE CONTEXTUAL ENVIRONMENT

Megatrends are broad long-term trends (lasting at least 10-15 years) that influence societies globally and locally and are therefore central to scenario planning. Using megatrends as a framework, CIFS carries out a preliminary analysis of the contextual environment – i.e., society, values, culture, technology, politics, economics, and the built and natural environment – with a focus on how it may impact a particular sector, group, system, or concept both today and in the future.

### ENGAGEMENT WITH AND ANALYSIS OF THE INTERACTIONAL ENVIRONMENT

Using the megatrends as a point of departure, CIFS works directly with scenario process participants to identify and prioritize themes that are specific to the focus of the scenario process. These themes emphasize

relevant developments within the scope of the scenario process that are both related to and occurring between key actors.

### DEVELOPMENT AND IMPACT ANALYSIS OF POLARITIES

Based on the identified trends and themes, CIFS develops a range of polarities that each propose two opposing directions in which the trends and themes could develop. CIFS and scenario process participants work together to identify the implications of the polarities.

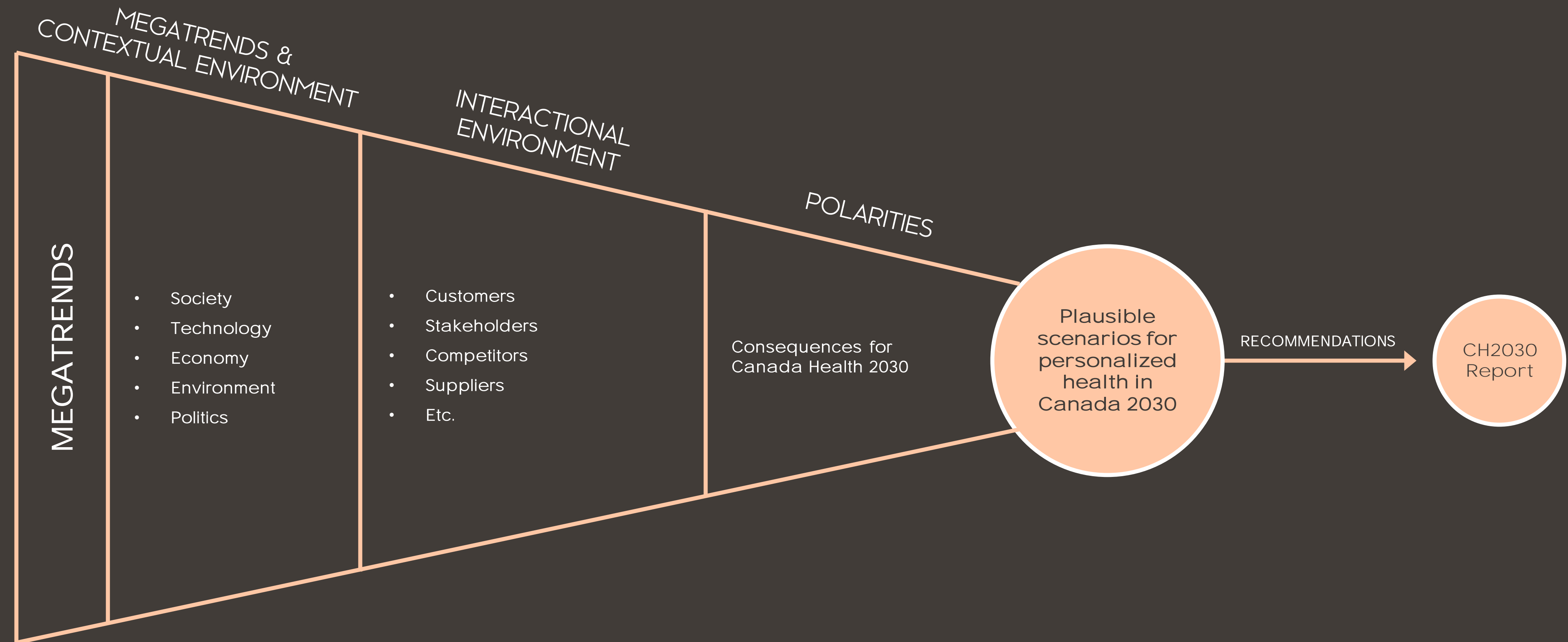
### FUTURE SCENARIO BUILDING

CIFS and scenario process participants identify two sets of polarities that are determined to have the greatest impact on future developments within the scope of the scenario process. These polarities are used to build a grid which lays out four plausible future scenarios. The scenarios take the form of narratives that include contextual information, implications for individuals, organizations, and societies, and insights that can be used for strategy, visioning and action plans.



# The Copenhagen Method™

CIFS ANALYTICAL PROGRESSION MODEL AND HOW WE PROGRESS THROUGH PROJECTS





## What makes a good scenario?

**Story:** A vivid description for engaging stakeholders

**Challenge:** Must challenge organizations' perceived wisdom about the future and provide insights useful to decision-makers

**Plausibility:** The future and events described must be plausible

**Consistency:** Must be logically consistent (the 'inner logic')

**Differentiation:** Must be structurally or qualitatively different

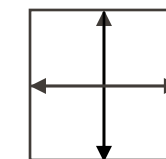
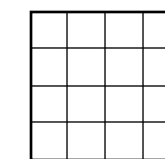
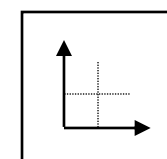
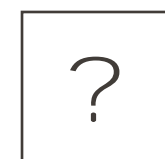
**Memorable:** Easy to remember; it helps to have catchy titles

**Balance:** Don't make scenarios too pessimistic or optimistic and don't assign probabilities

# Canada Health 20030 project plan and process



Phase	SETUP, PLANNING AND RESEARCH	THEMES AND TRENDS	INTERIM	CRITICAL UNCERTAINTIES AND POLARITIES	INTERIM	SCENARIOS SYNOPSES	INTERIM	STRATEGIC IMPLICATIONS	REPORTING
Event		Workshop I January 27, 2021		Workshop II February 17, 2021		Workshop III March 3, 2021		Workshop IV March 24, 2021	
Activity	Megatrend scoping, desk research, horizon scans, internal brainstorm/workshop, steering committee and participant recruitment	Introduction to CH 2030, scenario approach, trend exploration	Identification of uncertainties and development of polarities	Discussion and ranking of uncertainties	Development of scenario axes, scenario matrix and scenario grid	Discussion and qualification of scenario synopses and grid content	Development of four plausible future scenario narratives	Discussion of scenario narratives, implications, and strategy for supporting personalized healthcare in Canada	Final revision of scenario narratives, production of final report
Outcome	<b>Pre-read for Workshop I</b>  Future Brief with trend-analysis and potential implications	Identification of high-impact and high-uncertainty trends	<b>Pre-read for Workshop II</b>  Uncertainty catalogue  <b>Workshop II Survey: Selection of polarities</b>	Prioritization of critical strategic issues (high-impact, high-uncertainty issues)	<b>Pre-read for Workshop III</b>  Scenario axes and grid with four scenario synopses featuring core characteristics	Verified scenario grid and common understanding of scenario characteristics.	<b>Pre-read for Workshop IV</b>  Scenario narratives based on indicators and developments from scenario grid	Development of future-informed strategic implications, responses and innovation ideas	<b>Scenario report and executive summary</b>



Sep.-Dec. 2020      January 2021      February      March      April



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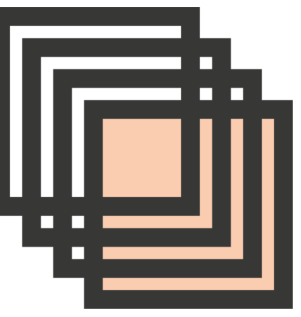
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# CANADA HEALTH 2030

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