New Brunswick's AgeTech Innovation Environment

An overview of the policy landscape, challenges and opportunities

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How to cite this document

Patterson, P., Oulette, L., and Roddick, J. (2023) *New Brunswick's AgeTech Innovation Environment: An overview of the policy landscape, challenges and opportunities*. Fredericton, NB: AGE-WELL National Innovation Hub, APPTA.

Executive Summary

This report provides an overview of the context in which health technologies that can strengthen home care and home support services for older adults are developed, adopted, and maintained in New Brunswick. It also suggests opportunities to support health technology innovation and adoption. These topics are important in light of pressure the New Brunswick health system faces from population aging, and the potential for technologically supported home delivered services to slow growth in demand for comparatively expensive long-term care in the province.

The first section of the report provides an overview of the place that technology and innovation has had in New Brunswick's recent health strategies. Several of the strategies released before the COVID-19 pandemic discussed technological innovation and placed emphasis on using technology to improve health system sustainability and information sharing. Technological innovation was also an important part of the joint New Brunswick/federal Healthy Seniors Pilot Project initiative launched in 2018. The onset of the pandemic prompted many changes in health service delivery in New Brunswick, including facilitating the use of virtual service delivery, and technological innovation is prominent in several health strategies and initiatives released since early 2020.

The second section examines stages in the health technology development and adoption process, which can be considered a set of three interlocking policy ecosystems: research and development; commercialization; adoption and maintenance. The research and development policy ecosystem includes funding initiatives and programs aimed at supporting initial health technology development and testing. In the commercialization policy ecosystem, innovators are impacted by policies around regulatory approval for new technologies, as well as supports related to market development and investment to scale up production or service delivery capacity. In this stage, innovators face uncertainty about how their products or services will be received and they may adjust innovations based on feedback from initial customers and other market data sources. Finally, innovations enter the adoption and maintenance ecosystem, which is complex and includes several possible

pathways for integration of new health technologies in home care and home support delivery. Depending on the specific technology and how it is employed in care provision, policies related to provincial or federal government departments, private sector organizations, direct purchase by older adults, or a combination of those, may support the widespread adoption of a new technology by end users.

The final section explores opportunities for policy development to address remaining gaps in support for innovators involved in the development, commercialization, and adoption process. Opportunities include the development of a health technology database, or repository, to help streamline evidence-based decision making; the establishment of living lab communities to provide contextualized long-term data on health innovations; continued engagement with diverse stakeholders to provide timely feedback on technologies and strategies; and focusing resources to support implementation of new technologies by organizations and end users, to help ensure that technologies that are developed generate impact on health outcomes.

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Introduction

The New Brunswick health system faces pressure from population aging. Nearly half of the province's residents are above age 46, and older patients require, on average, more expensive care than younger individuals. Health spending in New Brunswick is projected to increase annually by up to 5 percent[1].

Surveys have found that older adults in New Brunswick prefer to reside in their homes for as long as possible[2], and approximately 90 percent live in private dwellings[3]. However, the proportion of older adults living in seniors residences or long-term care rises quickly among those above age 75[3]. Data from 2017 showed that a smaller proportion of New Brunswick older adults receive home care than live in long-term care or other residential facilities[2]. Expansion of the provision of home care services is a way to extend the period that older adults can live at home, and slow growth in demand for comparatively expensive long-term care.

Technological innovations that support older adults and their paid and unpaid caregivers can strengthen preventive health care and home care service delivery. In 2021, our hub ran a Policy Innovation Lab, funded through the New Brunswick Innovation Foundation's Social Innovation Research Fund, to examine innovation in technologies to support healthy aging*. New Brunswick technology innovators who participated in the Policy Lab identified several interlinked challenges in bringing forward market-ready solutions. These included difficulties related to information and communication with decision-makers; confusing policy and regulations; lack of funding after the initial research and development phase; and competing government priorities[4].

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* https://agewell-nih-appta.ca/wp-content/uploads/2021/11/Policy20Innovation20Lab20FINAL20REPORT.pdf

This overview of the New Brunswick AgeTech innovation environment examines the provincial context in which health technology that can support older adults and caregivers is developed, procured, adopted, and maintained. It also suggests points where targeted initiatives could address barriers to the development and maintenance of technological innovations that support care of older adults.

> AgeTech refers to the use of technologies and services to support the health, well-being and independent living of older adults[5].
>
> A health technology is a test, device, medicine, vaccine, procedure, program, or system developed to prevent, diagnose, or treat medical conditions; promote health; provide rehabilitation; or organize healthcare delivery. In this report we are mainly referring to devices, apps or online services[6].

While the discussion here focuses on home care and home support, many aspects of the policy environment and research and adoption processes also apply to other forms of health technology development in New Brunswick. Pathways for adoption of technologies by end users vary between settings, such as acute care, but if differences are taken into account, insights from this overview can help identify challenges and opportunities to support innovation in those fields.

Technology and Innovation in New Brunswick Health Strategies

Technological innovation has been considered in New Brunswick's health strategies for some time. The *We Are All in This Together* aging strategy released in 2017 identified roles for innovative technology in supporting older adults. It highlighted Carelink monitoring as an example of technology-based assistive tools that were in place, and described new technology as an important part of health system sustainability. Specific roles for new technology included improved information sharing between government and care providers, establishing New Brunswick as a "living lab" to pilot test innovations, expanding

electronic health record system usage, and using technology for scheduling and other efficiency improvements[2]. In 2018, the Public Health Agency of Canada and New Brunswick's Department of Social Development and Department of Health launched the joint three year, $75 million Healthy Seniors Pilot Project (HSPP) to fund applied research to support healthy aging in New Brunswick[7,8]. Several of the five focal areas within the HSPP program include testing and evaluating methods and technologies that promote healthy aging or delivery of health and support services, and one concentrates specifically on the application of supportive technologies to help older adults or caregivers in homes and care facilities[7].

The start of the COVID-19 pandemic in 2020 prompted many changes in the New Brunswick health system, including facilitating the use of virtual service delivery by covering it through publicly-funded health insurance[9]. The New Brunswick government also worked on developing new health strategies. In 2021, the Ministry of Health released a discussion paper which explored ways to ensure that the health system would be dependable in the future. It had a section devoted to innovative care using digital technology, and highlighted successful digital health services implemented during the pandemic. It also outlined plans to improve the digital and information technology infrastructure in the health system[1]. The New Brunswick Medical Society's response to the discussion paper was largely supportive, and pointed out the need for additional funding and supports to help care providers integrate new technologies in their services. It also argued for the development of a virtual care strategy and expansion of electronic health record systems[10].

The Ministry of Health's discussion paper and responses to it helped shape New Brunswick's recent *Stabilizing Health Care: An Urgent Call to Action* health sector strategy. It frames technological innovation in terms of reducing waste and inefficiency, and using technology to achieve a more integrated health care system. Specific points include expanding electronic health records systems, providing patients with greater access to their medical records, and adopting technologies, such as remote patient monitoring, that can improve health outcomes. The initiative also included providing provincial health insurance coverage for virtual primary care visits[11] and eVisitNB Inc. was selected to provide those services[12].

Significantly for health technology innovation, the plan also includes providing flexible funding for research trials and pilot projects[11].

In addition, there have also been joint federal and provincial initiatives related to health technology innovation. The *New Brunswick Virtual Care Action Plan* is a bilateral agreement that was initially developed in response to the pandemic[13,14]. It built upon earlier New Brunswick telehealth initiatives and focused specifically on innovations related to virtual care delivery and supporting the New Brunswick Department of Health's efforts to establish a permanent virtual care program. New Brunswick's proposed action plan included initiatives to develop its Connected Health virtual care program and expand community-based care solutions through incentives for integrating with provincial electronic medical record and eReferral systems, and to achieve an integrated digital health system for primary care[13]. These actions were intended to supplement health technology initiatives that were already underway, including the expansion of opportunities for New Brunswick vendors certified through the OntarioMD program, and the adoption of several digital health tools, such as the eReferral Single Entry Model Program, NB Virtual Care Mobile App, Microblogging MD, and Zoom for Healthcare[13].

Health Technology Development and Adoption Processes

Health technology development and adoption proceeds in stages. Initially, innovators identify opportunities and conduct *research and development* activities, such as developing prototypes and pilot testing. In the next stage they move products or services toward *commercialization* by achieving regulatory approval, developing markets, and scaling up production or service capacity. Finally, innovations enter an *adoption and maintenance* stage where they are integrated into daily use by organizations or end-users, and innovators may carry out user testing and redesign to refine or improve the products or services.

Figure 1 – Stages in Health Technology Development and Maintenance
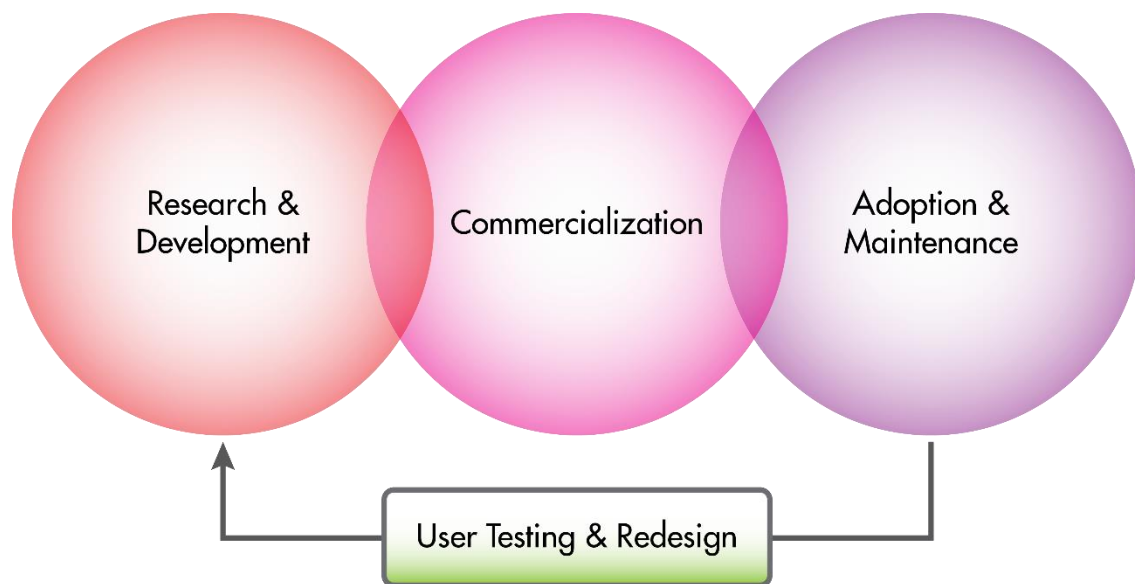
While these stages take place within New Brunswick's overall policy environment, each involves distinctive concerns and it is useful to examine them as a set of interlocking policy ecosystems.
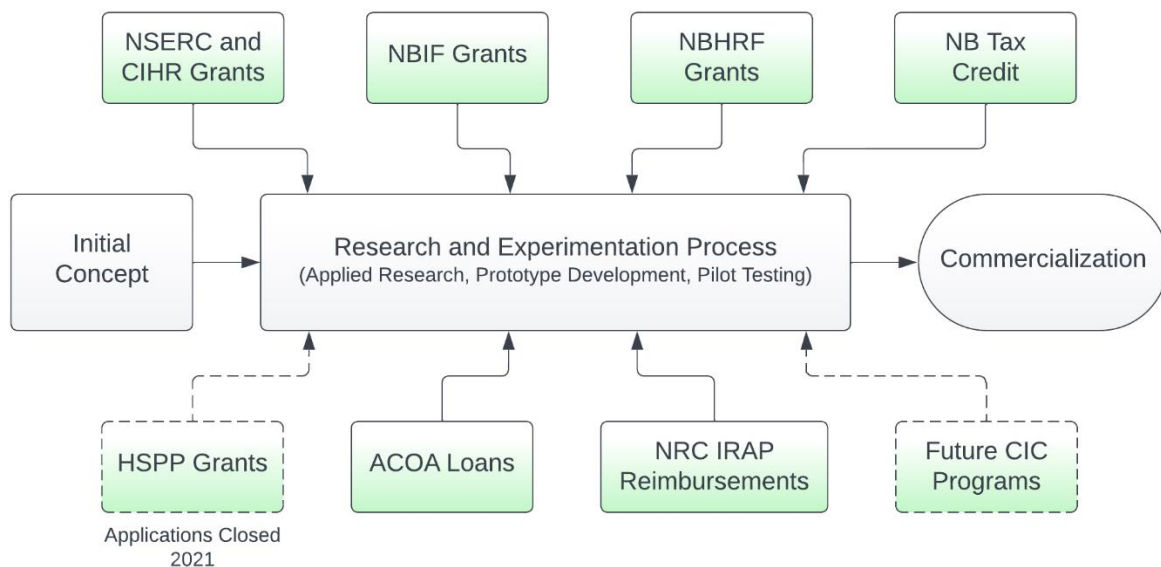
The Research and Development Ecosystem

Policies and programs to support innovators during the research and development phase are well established in New Brunswick. The 2017 New Brunswick aging strategy included a section devoted to research and innovation, which called for identifying public, private and non-profit partners to collaborate on developing innovative health solutions[2]. It highlighted improving the ability of innovators to leverage federal research funding for pilot initiatives, and establishing in New Brunswick a living lab focused on aging[2]. The federal/provincial HSPP collaboration accepted its final round of grant applications in 2021[7], but the program has been a source of funding for technological innovations in health, such as the introduction and evaluation of the MedReviewRx polypharmacy application in long-term care centers across the province[15,16]. New Brunswick's 2021 *Stabilizing Health Care* plan echoed the 2017 Aging Strategy and suggested partnering with small and medium businesses on innovative health technology. It also outlined plans to provide flexible funding for research trials and pilot projects[11].

Programs are in place in New Brunswick to support health technology research and development. New Brunswick has had the Research and Development Tax Credit in place since 1994[17]. It is part of the federal Scientific Research and Experimental Development (SR&ED) incentive program administered by the Canada Revenue Agency[18]. The New Brunswick tax credit has been revised several times and is currently a 15% fully refundable credit applicable to experimental development work, as defined in the federal *Income Tax Act*. It is typically used to cover work carried out to achieve advancements in materials, devices, products, or processes, but it can also potentially be used for applied work to advance scientific knowledge on practical applications, basic research that does not have a specific application in mind, or research support work[17].

Health technology innovators can access funding through provincial programs. ResearchNB, formally the New Brunswick Health Research Foundation (NBHRF), is an independent organization that was established by the government in 2008 to support health research[19,20]. It is funded by the province of New Brunswick and provides a variety of research grants, which

could include work on technological innovations[21]. Although it is not specifically for the health sector, innovators could apply for funding from the New Brunswick Innovation Foundation (NBIF). NBIF is a non-profit foundation that was established by the New Brunswick government in 2002 to provide funding for applied research and venture capital to support the development of innovative companies in the province[22,23]. NBIF provides several types of financial support for applied research and development expenses[24].

Figure 2 - The Research and Development Ecosystem

The federal government also supports research and development. University affiliated innovators can apply for a variety of research and development grants, primarily through funding programs provided by the Natural Sciences and Engineering Research Council and the Canadian Institutes for Health Research[25,26]. While it is not specifically aimed at the health sector, the Atlantic Canada Opportunities Agency (ACOA) provides a variety of grants and zero-interest loans that health technology innovators could potentially access. ACOA funding includes the Atlantic Innovation Fund, which is available for large-scale projects that include research and development and have potential for commercialization, and the Business Development Program, which provides loans that can be applied to productivity improvement in businesses or research and development by non-profit organizations[27]. The

federal National Research Council's Industrial Research Assistance Program (NRC IRAP) program also provides financial assistance, such as grants, to help small and medium-sized businesses develop technology-driven new or improved products, services or processes that have potential for commercialization. Businesses with supported projects submit monthly reimbursement claims for research and development expenses and receive payments to share those costs[28,29]. In 2022, the federal budget allocated funding for the establishment of the Canadian Innovation Corporation (CIC), a government agency aimed at increasing investment by businesses in research and development in Canada[30]. The NRC IRAP program is being integrated within the CIC, and other research funding and advisory programs will be established over time to support applied research, experimentation, and technological adaptation[30].

The Commercialization Policy Ecosystem

While programs to foster research and development are well established, Canada has been called a "country of perpetual pilot projects"[31] and participants in our Policy Innovation Lab identified a relative lack of support during the transition from prototype development to commercialization[4]. In part, that may be because supporting research and development is straightforward, consisting largely of providing resources or incentives, while supporting commercialization potentially involves making changes to additional policy areas, such regulatory approval, as well as providing support for market development and expansion of production or service delivery.

Newly developed health technologies must pass regulatory approval before they can move forward with commercialization. The processes for obtaining regulatory approvals may require input at federal and provincial levels and have been described as lengthy and complicated, which can reduce incentives for companies to innovate[32]. For health technologies, approvals are obtained through the Health Canada's Medical Devices Directorate. The directorate regulates medical devices for human use and must verify that

they meet safety, effectiveness and quality requirements set out in the federal *Food and Drugs Act*[33]. Within the Medical Devices Directorate, the Bureau of Evaluation is responsible for reviewing applications for new and amended medical devices, including digital health technology, such as software devices[33]. Health technology innovators may also choose to voluntarily apply to have their products or services accredited through the Health Standards Organization (HSO), an independent non-profit organization that develops standards and assessments for health products and services. Several of the HSO's standards are applicable to the use of high technology to support older adults to age in place, such as the Home Care Standard, and the Virtual Care Standard, and the recently developed Long-Term Care Standard[34-36]. Both Health Canada approvals and HSO standards apply to health technology entrepreneurs operating in New Brunswick.

Commercializing health innovations also requires market development and investment to scale up production and service capacity. When developing products for markets or users that are under-served by established companies, innovators face a high degree of uncertainty about how their services or technologies will be received[37,38]. That situation provides opportunities for rapid growth and disruption of existing markets[38]. It also involves a high risk of failure, making feedback from initial customers an essential part of product development by successful start-ups[37]. Some provincial organizations help mitigate some of those risks and support commercial expansion by New Brunswick health technology innovators. NBIF offers equity investments for the establishment of start-up companies, and early-stage venture capital investments to help innovators commercialize new technologies or services[22,24,39,40]. Innovators could also apply to Opportunities New Brunswick (Opportunities NB), a Crown corporation established to facilitate private-sector expansion through supporting high-growth opportunities[41]. Opportunities NB includes a Digital Health division and can provide funding and business development advice to help companies expand their capacities[41-43].

The federal government provides some support for commercializing innovative technologies. ACOA offers federal government programs to help Atlantic Canada businesses expand. It is not aimed at the health sector, but health technology innovators could apply for assistance. One funding stream within ACOA's *Regional Economic Growth through Innovation* program is intended to support business scale-up by providing funding to integrate technology, improve productivity or create new products. The other stream provides funding to non-profit organizations which support business development networks that foster innovation[27].

Figure 3 - The Commercialization Policy Ecosystem
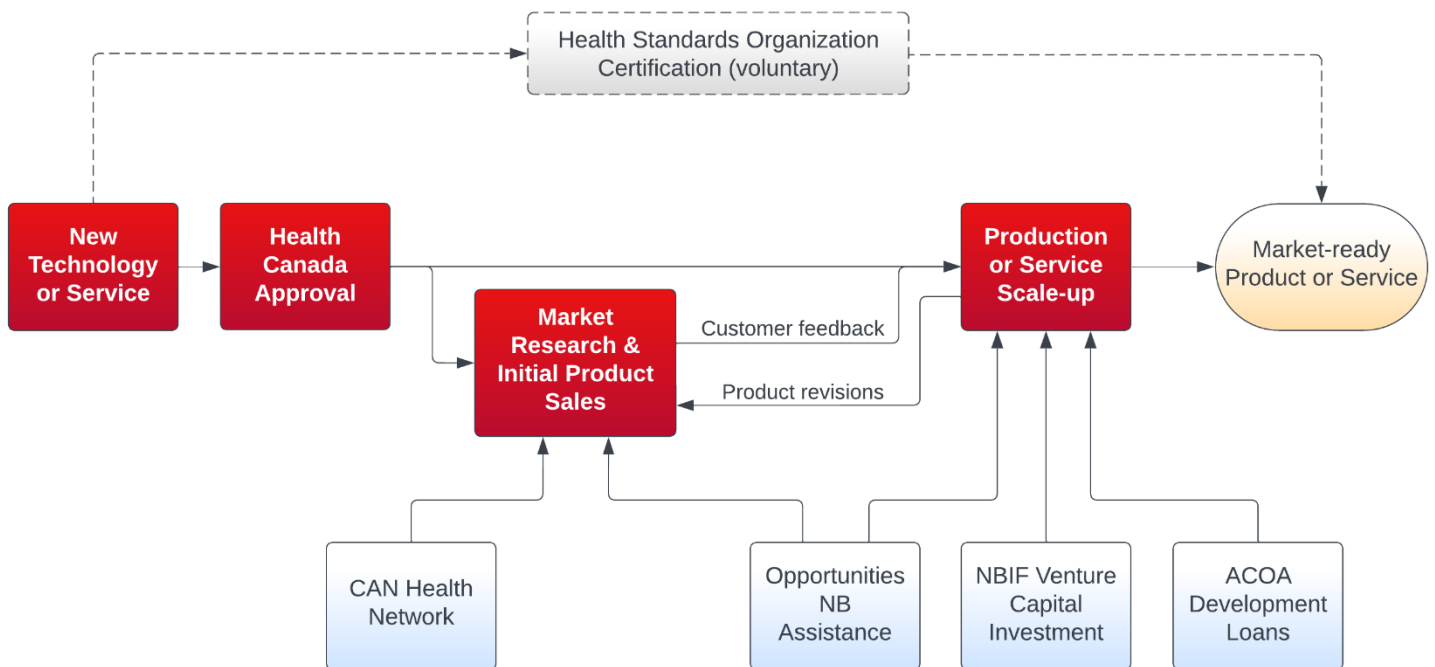
The national Coordinated Accessible National (CAN) Health Network differs from NBIF, Opportunities NB, and ACOA, in that it does not provide funding for commercialization. Instead, CAN Health Network is a national partnership of Canadian health organizations and companies, with an Atlantic section led by Horizon Health Network (one of New Brunswick's two Regional Health Authorities). It supports commercialization of health technology innovations by facilitating access to potential buyers, helping innovators navigate

procurement procedure requirements, and providing an integrated marketplace where companies can demonstrate products for potential buyers throughout the network[44,45]. CAN Health Network's role in facilitating initial sales also can help innovators get feedback from paying customers, which is useful in refining products and ensuring they fit market needs[37].

The Technology Adoption and Maintenance Ecosystem

Once innovations have received regulatory approval and innovators have scaled up capacity to meet market demand, new health technologies must still be purchased by organizations or individuals and integrated into routine use in order to have lasting impacts on the health system and on population health. The policy environment for health technology adoption and maintenance in New Brunswick is complex, involving multiple government branches, health sector and private sector organizations, and the older adults themselves. Thus, the effectiveness of policy levers for supporting adoption and maintenance is related to the characteristics of health technologies and how they fit within health care provision and patient care.

For health technologies that support older adults to age well in their homes or communities, the ways in-home services are provided are important. Home care can be divided broadly between home health care, which is typically provided by nurses or other licensed health professionals, and support services, which are largely non-medical and delivered by unlicensed care providers[46]. Innovations could apply to either, or both, types of service, depending on the specific health technology. There are also two main pathways for integration of technologies into home care practice: home care or support organizations may purchase technology for their employees to use when providing services, or older adults or their caregivers may purchase and/or operate the technology to support themselves or facilitate home care provision. Each pathway has implications for developing policies to support innovation.

When health service organizations purchase and implement technological innovations, one factor is whether the organization is a government branch, such as an agency or Crown corporation, or is a private business or non-profit group. When the organization is a private entity, such as a physician's practice, or Medavie Health Services New Brunswick which delivers the Extra-Mural Program under a contract with the Department of Health[47,48], new technology procurement depends on the purchasing organization's procedures. In some cases, individual care workers may purchase equipment, for example when a physician buys diagnostic instruments. Alternatively, an organization may purchase equipment through internal procurement processes and provide it to employees for their use. In either case, adoption of innovative health technologies by private organizations is more likely where there is the expectation that purchase costs will be recouped.

Two government branches in New Brunswick could potentially apply technological innovations to support home care: the Department of Social Development, and the Department of Health. The Department of Social Development does not provide home support services directly. It offers subsidies through the Long Term Care Program to help older adults who qualify afford home support services provided by private organizations[49-51]. Financial assistance for home support covers some high-technology services, such as Lifeline call buttons, and CareLink service[51]. The Department of Health also does not directly provide home care services. It funds the Extra-Mural Program and offers home and community-based health care services provided through Extra-Mural/ Ambulance New Brunswick Incorporated[47,48]. In their 2019-2022 strategic plan, Extra-Mural/ Ambulance New Brunswick identified as a priority the use of technology to enhance services delivery and promote innovative care, particularly in helping clients monitor and manage their own health[52]. Information is not publicly available about how the Department of Social Development, the Department of Health, or Medavie Health Services New Brunswick select specific technologies or services for inclusion in coverage by publicly-funded programs. This makes it difficult for innovators to apply to have new technologies or services adopted by those organizations.

The Department of Health may also facilitate the general adoption and maintenance of innovative technologies by the province's regional health authorities. Horizon Health Network's strategic plan includes several areas where technological innovations may be adopted, such as more efficient health information sharing, introducing flexible solutions for care delivery, use of virtual care, implementing online appointment booking, and applying emerging technologies[53]. Similarly, Vitalité Health Network's strategic plan identifies improved digital infrastructure and information technology as essential for meeting its objectives[54]. As with government departments, information is not publicly available about how decisions are made by New Brunswick's regional health authorities to procure specific technologies, which may impede access to those markets by health technology innovators.

New Brunswick government departments and the regional health authorities must follow provincial procurement regulations when buying innovative technologies to implement. That process is guided by the *NB First Procurement Strategy* and its related legislation, the New Brunswick *Procurement Act, S.N.B. 2012, C.20* and *Regulation 2014-93 under the Procurement Act (O.C. 2014-273)*[55-58]. The strategy requires that government buyers use the Service New Brunswick (Service NB) procurement process to obtain goods and services, most of which must be purchased through bidding on the New Brunswick Opportunities Network (NBON) platform[59-61]. Although the *NB First Procurement Strategy* requires that government departments and regional health authorities purchase goods and services from suppliers and contractors within the province, for goods and services (other than for construction) it applies only to contracts valued under $121,200 and allows exceptions or the use of alternate procurement procedures in cases where New Brunswick sources do not exist, cannot meet requirements, or New Brunswick bidders provide quotes that exceed budgeted costs[58,61]. New Brunswick government procurement is also subject to interprovincial and international trade agreements[61], and the Minister of Service New Brunswick can grant temporary exemptions to the *Procurement Act* if a demonstrable public good may be achieved as a result[56]. In practice, the costs would be well above the $121,200 threshold for government agencies to adopt most health technologies at scale and so many contracts would not be subject to the *NB First Procurement Strategy*. New health technology would be purchased

through other Service NB procedures that may not be readily accessible by new or small-scale innovators.

Figure 4 - The Technology Adoption and Maintenance Ecosystem
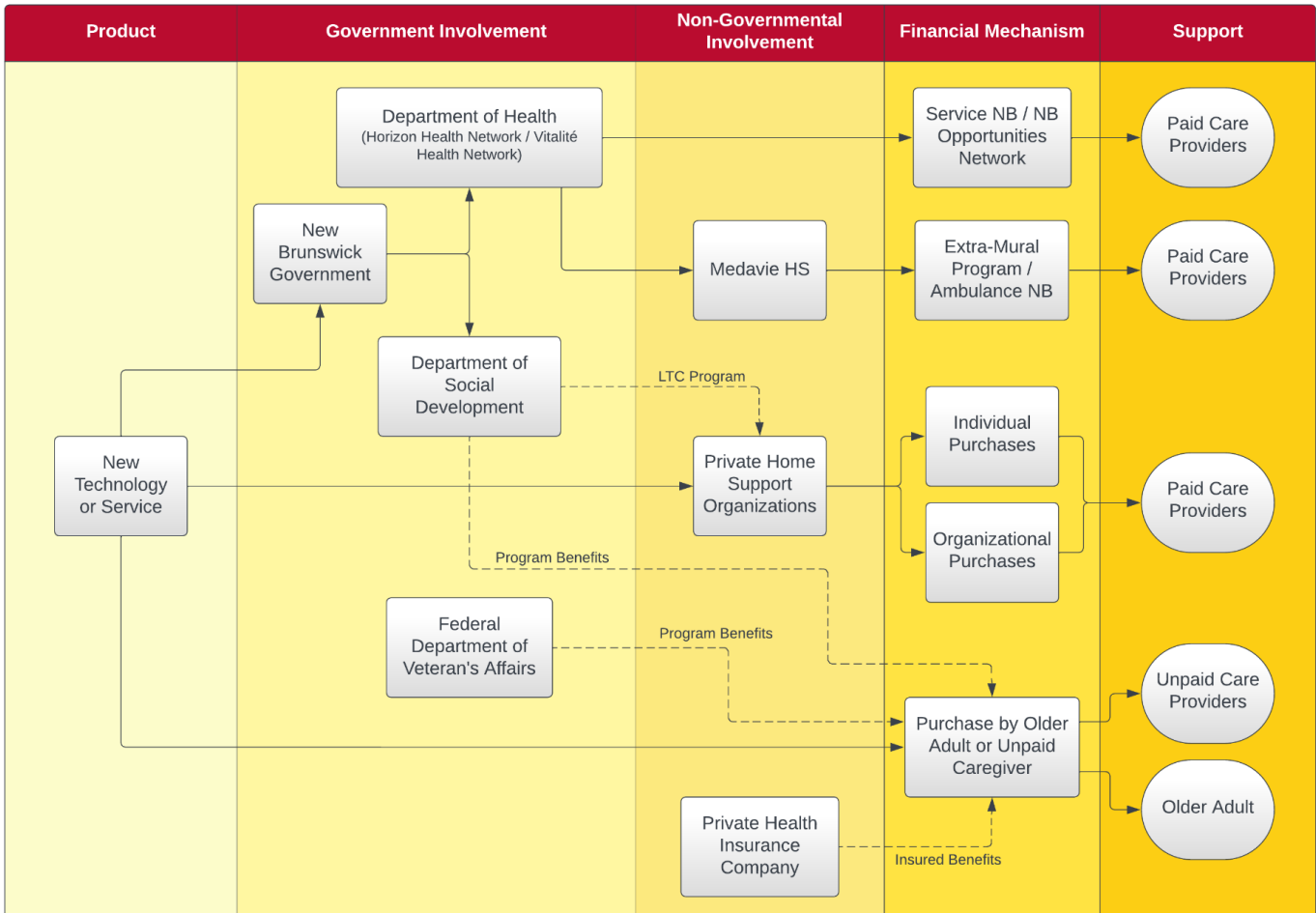
While some health technology innovations are adopted and maintained by service provision organizations or government agencies, others may be purchased directly by older adults or their caregivers. In some cases, the equipment is purchased out-of-pocket by individuals. In a national study, cost was identified as a barrier by 21% of older adults with unmet home care needs[46], and cost can be a factor in whether older adults adopt innovative technologies, particularly for individuals with lower incomes.

Older adults are sometimes able to use private health insurance benefits or government programs to purchase technology. In New Brunswick, Medavie Blue Cross is one of the main private health insurance providers and their policies regarding coverage are important for older adults who wish to access innovative health technologies. It is unclear from the publicly accessible parts of their website what health technologies are covered by insurance policies, or how new innovations would fit within existing categories[62]. The federal government's Department of Veterans Affairs also provides veterans with coverage for some health technologies if they receive disability benefits, are in the Veterans Independence Program, receive War Veterans Allowance, or receive financial assistance from Veterans Affairs Canada for long-term care[63]. Technologies covered by the Department of Veterans Affairs are required to have passed regulatory approval, and fall within categories specified within the Programs of Choice offered, such as Aids for Daily Living, Nursing Services, or Special Equipment. Most of the coverage is for lower technology items, for example walkers or grab bars in washrooms, but could include some higher technology innovations related to mobility, safety in the home, or medication management[64].

Once innovative technologies are in the marketplace and are adopted widely in the health system or general public, user testing and redesign facilitates evaluation and updating. When innovations are implemented by private organizations, research is often conducted internally for commercial purposes. The findings from such research may not be available to the public or to policy-makers, or be in forms that help evaluate impacts on public health and the overall health system. It is also not clear from publicly available sources what processes are used by New Brunswick's government departments or the regional health authorities to evaluate existing health technology, or to determine when upgrades or replacement would be appropriate. It is important that data be available about performance and criteria for replacement of technologies that are included in publicly-funded health services, or are used by private organizations that receive public funding to provide services to older adults living in the community. Such data are necessary for systematically evaluating clinical outcomes and cost-effectiveness to ensure public money is delivering beneficial impacts.

Opportunities for Policy Development

Programs exist in New Brunswick that support each stage of the innovation and adoption process, but the space where health technologies exist in a public health system is complex and reflects challenges experienced in both the research and development cycle, as well as the structure of the health care system administrative, front-line, and patient levels. There are opportunities to develop policies and programs to address these challenges.

Supporting Development of a Health Innovations Database

In order to make informed decisions, the buyer, whether government, private company, or the end-user, needs appropriate information regarding available products. From the perspective of innovators who participated in our Policy Innovation Lab, transparency around how new health technology is selected during procurement processes, and what criteria are used to determine when existing technology becomes obsolete and should be replaced, would be helpful for developing the business case for their products or services[4]. Having access to information about what health technology is available, which innovations have been selected for implementation, and what criteria are used in procurement decisions will help innovators develop solutions that are suitable for application in New Brunswick, and help purchasers make informed comparisons between options.

The New Brunswick Medical Society has suggested mapping existing technology, evaluating technical requirements, and gathering health quality and monitoring data to support technological improvement in the health system and facilitate continuous quality improvement[10]. Focusing on what an emergent technology does, and its clinical and cost effectiveness, rather than on how it fits within procurement system classification categories, could enable smoother adoption of innovations. The adoption of new health technologies could also be facilitated by increased communication between the agencies that support

research and development and/or commercialization of new technologies, and those that procure and implement them, such as Service NB, the Departments of Social Development and Health, and regional health authorities. CAN Health Network is an example of how providing information and a network of contacts can create links between the research and development and adoption and maintenance environments that assist innovators with market development and navigating potential customers' procurement processes[45]. Having innovators register with CAN Health Network as part of the research and development funding process might help foster productive links. The creation of a similar New Brunswick-focused information support system would also be useful to help innovators move their emerging technologies into the marketplace.

Integrating data collection and the evaluation of technology as part of routine practice would provide necessary data for procurement decisions. The information generated needs to be archived and analyzed to be meaningful, however. The establishment of a centralized New Brunswick health technology database, or repository, has the potential to streamline decision-making and cross compare health technologies based on outcomes, readiness, and user preference. Establishing a database would involve:

- Establish a steering committee with the objective of identifying roles, partnerships, and funding avenues for the development and deployment of the database. This steering committee, along with engagement of partners will establish the reporting criteria for the technologies on the database;
- Procure an appropriate platform to house and manage the database; and
- Secure funding for project inclusive of: database development, hiring staff, onboarding of innovations, ongoing data management.

Establishment of Living Lab Communities

Opportunities NB has pointed out that New Brunswick can act as a "microcosm of Canada's makeup"[43] and the province's 2017 aging strategy suggested establishing a permanent living lab in the province to test seniors care approaches[2]. Participants in our Policy Lab made a similar suggestion[4]. The HSPP program has demonstrated that New Brunswick can provide a suitable region for testing and evaluating innovations that support the health of older adults[7]. A permanent living lab has not been established, but having designated communities for evaluation could potentially generate information on innovations in the later stages of research and development. Testing new technologies or services in specific communities could be integrated as a component in regulatory approval in the commercialization stage. Results from testing in living lab communities could also be used as criteria for determining whether specific technologies would qualify for inclusion in government programs or subsidized services. Designated living lab communities could also provide consistent data over a long period of time to facilitate systematic evaluation of the clinical and cost impacts of emerging technologies and contribute to ongoing redesign and quality improvement.

Establishing permanent designated living lab communities would involve:

- Identifying a small number of New Brunswick communities that have a suitable mix of health services and have demographic characteristics that enable the rigorous evaluation of outcomes, including impacts on economically disadvantaged, racialized, or sexually diverse populations;
- Engagement with stakeholders in each community to get broad support for participating in health technology research; and
- Engagement with Health Canada's Medical Devices Directorate to establish protocols for including testing in the living lab communities in regulatory approval of technologies and services.

Continued Engagement on Digital Health Strategies

The COVID-19 pandemic demonstrated the value of virtual care for primary care service delivery and ongoing development of technologies that facilitate virtual or remote access can potentially strengthen home care services. New Brunswick has embraced digital health. It is one of the five provinces that have digital or virtual health development within a governance structure, in this case under the mandate of Opportunities New Brunswick[43]. The New Brunswick Medical Society has recommended providing innovative care using digital technologies, and implementing a provincial virtual care framework[10]. The bilateral *New Brunswick Virtual Care Action Plan* provides such a framework for implementing virtual services and including them in community-based care [13]. New innovations have the potential to quickly make strategies outdated, however, particularly in areas such as digital health. It is important that health and social service authorities create opportunities to work together with multiple stakeholders to get feedback on current digital health frameworks and strategies.

Three key objectives of this engagement should be to:

- define and scope the inclusion and use of health technologies beyond the hospital setting;
- ensure that there is a focus within a digital health framework for digital literacy education for all; and
- ensure that there is a focus within the strategy to support healthy aging.

Focusing Resources on Implementation by Organizations and End Users

Much of the support for innovative health technologies has been aimed at research and development, and to a lesser extent commercialization and scale-up. Financial supports are in place in the form of tax credits for research and development expenses, as well as grants, zero-interest loans, or venture capital investments that are aimed at research and development (NBHRF; NRC IRAP), scale-up (Opportunities NB), or both stages (NBIF; ACOA).

The current focus on supporting the early stages of the innovation process does not address potential barriers to adoption and integration of new technology by older adults, their caregivers, and the wider health system.

The New Brunswick government has several policy levers available to promote the adoption of innovative health technology that can support healthy aging in the community. Policies guiding government departments provide avenues to directly influence technology adoption. The Department of Social Development is involved in home support and long-term care through providing funding to subsidize care provision organizations and through programs that allow older adults to hire services or purchase equipment. In the past, the department has used its role to encourage the implementation of innovations, for example by supporting the use of CareLink remote monitoring technology[2]. The Department of Health is also able to promote adoption and maintenance of innovative technologies by the province's regional health authorities. Horizon Health Network and Vitalité Health Network both have strategies which could be supported that include the acquisition and implementation of new technologies in the regions they serve[53,54].

Where businesses or non-profit organizations use technology to provide services for older adults, the New Brunswick government has less direct influence on the adoption of innovations. Policy levers that can potentially support uptake by private organizations consist mainly of providing tax credits or similar incentives to companies that adopt specific technologies. When an innovation is used in publicly-funded services or services covered by health insurance, adoption may also be influenced through compensation models[32].

It is important to note that adoption of health technologies by government agencies and private companies may face obstacles as gaps emerge between the development of innovations and their incorporation in programs and service delivery. Participants in our Policy Innovation Lab pointed out that technologies often are not recognized by existing programs or insurance coverage[4]. Similarly, the federal consultation on digital health noted that insurance coverage influences rates of adoption and that there is a need to continuously update definitions as new services become available[32]. Some industry stakeholder

participants in the federal consultation also pointed out challenges from procurement processes. They described processes similar to the ones used by Service NB as being prescriptive and focused on cost-containment rather than innovation, and prone to reward large corporations that had greater access to funding and other key resources[32]. Participants in our Policy Innovation Lab also noted that procurement processes could make it difficult to market innovative products or services to government agencies[4]. As the *New Brunswick Virtual Care Action Plan*[13] is implemented, transparency about criteria for selected technology and the point of origin of suppliers will be important for making opportunities for innovators in the province.

The government has relatively few policy levers available to get private health insurance companies to expand coverage for innovative technologies, but could potentially offer incentives to include them. In cases where New Brunswick government agencies apply technology directly, or provide funding for older adults to purchase equipment for home use, some obstacles to widespread adoption of innovations could be mitigated. One option would be to routinely evaluate emerging technologies and update definitions to include those that perform well. This could be supported with the development of a program similar to the existing *New Brunswick Drug Plan*[65], to provide publicly-funded coverage to help uninsured residents access health technology. The evaluation process would be facilitated if New Brunswick also establishes living lab communities and a health innovations database, as described above. Another option would be to increase flexibility by providing health-spending allowances, or apply a similar model to the existing Self-Managed Support program that provides funding for individuals to directly hire home support services[66], which would allow older adults to choose the health technology that best fits their needs.

Key areas for resource allocation to support successful adoption by end users:

- Providing targeted funding to regional health authorities for the implementation and maintenance of new technology;

- Programs by the Department of Social Development or Department of Health for funding the implementation of innovative technologies or services in home support, or purchase by end users;
- And focusing decision criteria on clinical and service provision outcomes, economic cost/benefit evaluations, and the feasibility of implementation.

Conclusion

It is important to recognize that although policies often categorize people over the age of 65 homogenously, they are a complex and diverse population with varied needs. It is also important to recognise that factors which support successful aging in the community begin acting well before an individual reaches advanced age, or the typical 65-year benchmark, and so the space for health innovations that support aging in the community extends beyond technologies oriented specifically toward older individuals. This is illustrated by findings from a 2018 Statistics Canada report, which showed using data from the 2015/2016 Canadian Community Health Survey that people in the 35 to 49 age range had the highest proportion of unmet needs for home health care and support services[46]. Although the focus of this policy environment analysis remains on enhancing the adoption and scale of technologies that support healthy aging, supporting technologies that promote health throughout an individual's life span may be an appropriate and inclusive policy approach which contributes to people remaining healthy in their communities as they age.

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