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Improving Oversight of Self-Managed Care
Department of Health and Community Services

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Executive Summary

Self-managed care (SMC) is a service delivery option within the Provincial Home Support Program (PHSP) that allows eligible clients to hire and direct their own employees in the provision of care. SMC is an important element of the PHSP as it enhances client choice, independence and equitable access to the Program across urban and regional areas of the province.

A comprehensive review of the PHSP conducted in 2016 identified the need to improve SMC, particularly with respect to program oversight, accountability and easing the administrative burden faced by the Regional Health Authorities (RHAs), clients, their families, home support workers (HSW), and, bookkeepers. Additionally, with the planned implementation of service-level agreements (SLAs) with agency-based home support providers, the need exists to harmonize oversight and monitoring requirements across service delivery channels.

As such, the Department of Health and Community Services (HCS) engaged Deloitte Inc. to provide analysis, options and recommendations to improve SMC oversight and accountability. In providing this decision-support to a Steering Committee comprised of representatives from HCS and the RHAs, the following key activities were completed:

- Refinement of the Province's oversight requirements for SMC service plan development and coordination, service monitoring, financial management and client payment processing, and program quality management;
- The identification and evaluation of policy, process and technology options for fulfilling the Province's program monitoring requirements; and,
- Further analysis and design of the preferred approach including considerations for how the future model will be implemented, integrated and operationalized.

From a policy and programming standpoint, the Department working in collaboration with the RHAs, identified the range of requirements that would improve the ability of RHA case managers to monitor service delivery against care plans and measure clinical outcomes, while also minimizing the risk of financial abuse and fraud. Most notably, these requirements include:

- Verification of compliance with legislative and regulatory requirements for operating as a small business;
- Verification of required HSW competencies and qualifications;
- Electronic and independent verification of actual hours of care delivered relative to approved services and funding arrangements;

- Verification of services delivered relative to client needs as determined by a formal clinical assessment;
- Tracking of missed visits, refused services, support worker turnover, safety incidences, family concerns, and other leading indicators for case manager intervention and evidence-based care planning; and
- Centralized service and funding agreements and an auditable record of client payments.

In addition to fulfilling the identified program monitoring requirements, the Department seeks to implement an oversight and delivery model for SMC that:

- Enhances the experience of clients, HSWs, RHA case managers, and, provincial policy-makers while reducing administrative burden;
- Minimizes the upfront and sustaining costs of attaining the desired level of oversight and control;
- Integrates with the wider PHSP, adjacent community-based programs, and the provincial health system; and,
- Is proven, robust and relatively easy to implement in a timely fashion.

Research into the oversight and monitoring policies and practices across comparable self-managed and self-directed programs in Canada failed to identify a mature model that could readily be adapted to meet the Province's requirements. In fact, jurisdictional research confirmed that other Canadian provinces that provide SMC as an option for home supports and home care face similar challenges related to ensuring public funds are being used for the intended purposes and the desired client outcomes are consistently being achieved.

The Canadian provincial landscape can be characterized by policies that are inherently dependent on self-reported information and resource-intensive, yet relatively infrequently completed, clinical reassessment and financial audit processes. While policy and process changes are likely to yield some level of improvement, it is apparent that attaining the Province's oversight and accountability objectives will require providing RHA case managers, clients, and support workers with additional technology tools. Additionally, the timely application of technology in SMC would support alignment of oversight and monitoring requirements with those embedded within draft agency SLAs.

That said, the use of technology in enabling and streamlining oversight of SMC is relatively limited in Canada, and where select examples do exist, they lack scale and integration with other programs and services. From a global perspective, the United States has been among the most aggressive jurisdictions in pursuing increased accountability and oversight in home care through the use of technology.

Federal home care Medicaid funding is dependent on the use of electronic visit verification (EVV) systems at the state level. EVV systems minimize the risk of fraud through electronically capturing the date, time start and finish,

location, and type of service, as well as the identity of the client and the caregiver on-site at the client's home during the visit.

While all EVV systems provide an independently verifiable record of services delivered, significant variation exists across US states in system features beyond visit verification (e.g., clinical reporting, caregiver training, and qualifications, financial management, etc.) and implementation approach. Moreover, while there are many home health technology solutions on the market, many US states have chosen to mandate a single vendor to drive program standardization, consistent reporting, and minimize administration.

Assessing the features and capabilities of home health care systems reveals the functionality exists in the marketplace that substantially aligns with the Province's program monitoring requirements. There are numerous solutions, some of which have been adopted by agency-based providers in Canada including Newfoundland and Labrador, which provide features that span:

- Patient intake and charting;
- Time and task reporting;
- Electronic signature and employee tracking;
- Medication databases
- Visit scheduling; and,
- Billing and invoicing.

The capabilities of existing solutions, which are predominantly cloud-based, suggest significant improvements in case management are also possible with automation of many administrative tasks that are currently time-consuming for the RHAs. Moreover, the reporting and analytics capabilities of home health care solutions would enable quality monitoring at program-level across regions, client groups, and, service delivery channels; and would support the Department's goal of a standardized provincial program.

Many features of home health care systems apply to SMC within the PHSP, and there are select examples where functionality has been extended to support enhanced client choice and self-directed care (e.g., scheduling preferences, support worker preferences, clinical self-reporting). That said, it is important to note these systems have been ostensibly designed to meet the needs of home care agencies, not individual employers who manage their own care.

As such, the design and implementation of technology tools for SMC will need to consider the fragmented and distributed nature of those clients, their unique user requirements (e.g., client frailty, access to devices and mobility services, business management) and the significance of the shift in the Province's accountability expectations. Numerous case examples exist outside of community care where governments have utilized Software-as-a-Service (SaaS) solutions, customer experience methods, user-centered design, agile development methods and analytics to design and deliver personalized, high-quality, low-cost services at scale. Moreover, organizations in the public and private sector are increasingly looking toward

scalable technology platforms, not point solutions in fulfilling their technology requirements.

Given the Province's desire to establish a streamlined, integrated oversight and delivery model for SMC it is important to consider the wider program context and the status of concurrent improvement initiatives. The implementation of agency SLAs will likely drive adoption of new technology tools, and the potential for multiple disjointed systems across the Newfoundland and Labrador home care system to arise. Furthermore, any initiatives aimed at modernizing technologies that support the breadth of community support services and clients across the continuum of care would benefit from a single, integrated approach.

With these considerations in mind, Deloitte recommends the Department work with the RHAs and Newfoundland Centre for Health Information (NLCHI) to:

- Design and deploy a scalable and integrated cloud-based home health care SaaS platform, modified to meet the Province's SMC oversight and monitoring requirements;
- Establish a common and standardized home health platform across agency and SMC service delivery channels within the PHSP;
- Assume primary responsibility for designing and funding[1] the common home health system with the understanding that the Province will be the primary beneficiary of improved oversight, reduced fraud, and administrative efficiencies; and,
- Continue to pursue complementary incremental policy and process improvements in SMC programming.

To implement and operationalize this approach, it is recommended that the Department, the RHAs and NLCHI:

- Gain hands-on experience with the functionality of home health care technology solutions by soliciting multiple vendor demonstrations;
- Gather requirements for external user groups, including PHSP clients; client designates, HSWs, and informal caregivers;
- Undertake a competitive procurement process to select a strategic partner with the technology and organizational capabilities to:
    - o Provide a cloud-based home health care solution under a SaaS licensing model;
    - o Adapt existing technologies to meet the Province's program monitoring requirements for SMC;
    - o Adapt existing technologies to enable monitoring and delivery of agency-based care and SLAs; and,
    - o Evolve the service offering to include enablement of other community-based programs and services.
- Define the Province's preferred technology licensing model and conduct further quantitative analysis to refine and validate expected

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[1] Primary funding responsibility is non-exclusive; the Province should identify the optimal funding model which may involve cost sharing with external entites.

improvements in reduced fraud and operational efficiencies relative to estimated technology costs;

- Apply an inclusive, user-centered and agile approach to solution development and deployment comprised of:
    - Rapid prototype development via co-design to validate and refine requirements; and,
    - Pilot solution deployment and phase implementation beginning with SMC clients, ideally within a RHA or client cohort who are conducive to change.
- Quantify improvements in program effectiveness and efficiency post-implementation and seek continuous improvement as the needs of clients and the PHSP program evolve.

This approach to establishing an improved and integrated approach to SMC represents a bold step forward for the Province but also represents the opportunity to become the leading Canadian jurisdiction in self-managed programming. This course of action is expected to substantially improve program accountability and streamline service delivery in a cost-effective manner to ultimately sustain SMC as a viable choice within the PHSP.

Introduction

As part of a wider renewal of the Provincial Home Support Program (PHSP), the Department of Health and Community Services (HCS) seeks to design and implement an improved oversight and integrated delivery model for self-managed care (SMC). The following report summarizes research and analysis into policy options to strengthen accountability, ease administrative burden and improve outcomes for clients living in the community.

Background & Context

The Newfoundland and Labrador (GNL) Department of Health and Community Services (HCS) is committed to supporting individuals to live in their homes and remain independent through the Provincial Home Support Program (PHSP). The PHSP represents a significant investment by the Province and is an integral component of the Department's guiding strategy.

In recent years, the PHSP has seen increasing demand for services and significant growth in expenditure. This demand for service is projected to continue as the population ages and as health care resources are challenged to address the increased service demands. Consequently, in 2016 the Department engaged Deloitte Inc. (Deloitte) to conduct a comprehensive review of PHSP aimed at identifying the efficiency and effectiveness improvements necessary for quality, sustainable home support services.

The review identified a future vision applicable to all home support services in the province and guiding principles which the Department and the four RHAs are committed to as fundamental to future service planning, resource allocation and decision making regarding PHSP.

Future Program Vision: All citizens of the Province have access to the home support services they need to help them remain independent in their homes and communities, avoid unnecessary hospitalization and long-term care placement, and maintain their well-being.

Within this vision and guiding principles, the Department is in the midst of implementing the various recommendations to improve program effectiveness and efficiency identified by the review.

SMC whereby eligible clients employ and direct their own home support workers was identified in the review as a valuable element of the wider

Guiding Principles:
- The home support services provided will be of high quality, client-centered and based on determined need;
- Home support services will be planned in collaboration with clients, their families and other informal supports, and key health and community service providers;
- Clients will have choice in determining how home support services are delivered in their homes
- Access to and delivery of home support will be undertaken by the RHA's in a timely manner;
- Home support services will help promote independence, safety, and social and community inclusion; and
- Home support services will be fully integrated with other health and community services.

program. SMC is fundamental to maintaining the well-being and independence of seniors and persons with disabilities, or their designate, who are eligible and capable of managing their own care in their home. It is particularly relevant for clients residing in rural regions where agency-based home care services may not be available. SMC contributes to the efficient and effective utilization of the provincial health system by reducing more costly care alternatives including emergency room visits, acute care alternative care days and inappropriate admissions to long-term care. Recognizing the relevance and importance of SMC, the review also recommended the need for increased oversight and integration in the delivery of the Program.

Presently, the ability for the RHAs to effectively monitor the delivery of care and adherence to established service plans and client clinical outcomes is limited. Effective service monitoring is impacted by resource intensive paper-based processes, a significant reliance upon self-reported information, and relatively infrequent financial audit and clinical reassessment processes.

These deficiencies in service delivery monitoring result in the potential for payments to care providers for services that are not delivered. Furthermore, a lack of visibility into clinical client outcomes impedes the ability of the RHAs to make informed, timely and risk-based decisions on the scope of service plans and referral to other support and services that may help sustain clients living independently in the community.

Finally, as the Department is seeking concurrent improvements to oversight of agency-based care through the implementation of agency service-level agreements (SLAs), the need exists to harmonize oversight practices across service delivery channels in the interests of a standardized program.

Objectives & Approach

Given this background context, the Department subsequently re-engaged Deloitte to:

- Conduct analysis and make design recommendations on a SMC oversight model and integrated delivery approach that:
    - Improves the Province's ability to monitor compliance with governing policies and the conditions of SMC funding;
    - Simplifies the delivery of the services needed for effective SMC management (e.g., bookkeeping);
    - Improves the visibility of client clinical outcomes; and,
    - Supports and complements the wider array of PHSP objectives (e.g., quality, client-centeredness, sustainability, family collaboration, etc.).
- Provide guidance on how the Department and the RHAs may implement and operationalize recommendations.

In providing this decision support to a Steering Committee comprised of representatives from the Department and the RHAs, the following key activities were completed:

- Refinement of the Province's requirements for SMC service plan development and coordination, service monitoring, financial management and client payment processing, and program quality management;
- The identification and evaluation of policy, process and technology options for fulfilling the Province's program monitoring requirements; and,
- Further analysis and design of the preferred approach including considerations for how the future model will be implemented, integrated and operationalized.

Per Figure 1 below, research and analysis activities were completed over approximately 6-weeks and were complemented with stakeholder consultations[2] and workshops with the Steering Committee. Additionally, working recommendations were presented to the PHSP Advisory Committee for input and validation.

Consolidate Program Requirements	Identify Monitoring Options	Evaluate Monitoring Options	Develop & Report Recommendations
• **Duration:** ~1 week	• **Duration:** ~2 weeks	• **Duration:** ~1.5 weeks	• **Duration:** ~1.5 weeks
• **Key Activities:**	• **Key Activities:**	• **Key Activities:**	• **Key Activities:**
• Document review	• Jurisdictional research	• Analysis of options	• Research, consultation with internal SMEs into other key considerations
• Stakeholder consultations	• Desktop market scan	• Workshops with HCS and RHA leaders	• Report writing
• Workshops with HCS and RHA leaders	• Stakeholder consultations	• Additional design of how short-listed options may be implemented (e.g. RFP) and operationalized	• Consultations to validation recommendations
• **Deliverables / Work Products:**	• **Deliverables / Work Products:**		• **Deliverables / Work Products:**
• Preliminary requirements document	• Inventory of potential monitoring options	• **Deliverables / Work Products:**	• Summary report detailing analysis and recommendations
• Evaluation framework for monitoring options		• Assessment / ranking of options	
		• Short-list of preferred options (up to three)	
		• Revised requirements document	

Figure 1: Project Approach

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[2] See the report appendix for a full listing of stakeholders consulted.

Oversight & Monitoring Requirements

The Province's future oversight and monitoring requirements for SMC seek to address control deficiencies and workflow inefficiencies that currently exist in service delivery. Given this, the following section profiles the current state of SMC oversight and monitoring and presents refined, future requirements. The refined program requirements were consolidated from various sources including a review of policy and program documents, consultations with RHA stakeholders, draft agency SLAs, as well as the preliminary requirements definition for home health technology completed by the Newfoundland and Labrador Centre for Health Information (NLCHI).

Current Oversight & Monitoring Practices

Understanding the current state of oversight and program delivery is essential for determining the gaps to be addressed in a future model, and Figure 2 below defines the process relevant to SMC within the wider PHSP.

Figure 2: PHSP Process Framework & Scope of SMC Oversight & Monitoring

Review of policy and programming documents and consultations with stakeholders across the RHAs and the Department revealed key issues and challenges related to oversight and monitoring within each of these key processes. Table 1 below presents the key activities undertaken by RHA staff in administering SMC and the observed issues and challenges.

Table 1: Current Issues & Challenges in SMC Oversight & Monitoring

Process	Key Activities	Issues & Challenges

Service Plan Development & Coordination	Confirm SMC Eligibility
	
	Communicate Clinical Assessment
	
	Create Service Plan
	
	Create Service Agreement
	
	Create Funding Agreement
	
	Initiate Services
		• Service plan development involves multiple technology systems (e.g., CRMS, interRAI, Meditech), manual interfaces, and paper-based workflows.
		• Communications among RHA staff, clients and care delegates involves various disparate methods (e.g., email, telephone, and fax), lack a single system of record for documentation and is labour intensive to manage.
		• Clinical assessments have not been historically communicated with client, HSW, and others within the client's circle of care.
		• Literacy level in service agreements can be challenging for some clients.
		• Service initiation can be delayed, or supports can be provided without valid service or funding agreements, due to delays in clients fulfilling the requirements for setting-up and operating a business.
		• Various conditions of funding are included in client handbook and contract documents that are not routinely verified before the initiation of services, these include:
		  o Compliance to legislative and regulatory requirements for small businesses;
		  o Business and Canada Revenue Agency (CRA) registration; and,
		  o A valid employment contract, support worker job description and criminal record check.
		• SMC clients have discretion over the selection of bookkeeping services, which may be of varying quality; this may create a risk to service continuity if payroll administration is inadequate.

Service Monitoring	Monitor Client Progress & Outcomes Investigate Incidents Review Service Plan Re-Assess Client Needs Refer Client to Other Support Services	• RHAs lack the ability to independently verify compliance to approved client service plans; while clients approve HSW timesheets, there remains a risk of fraud and financial abuse. • There are currently no requirements in place for routine progress reportingrelative to clients' defined care objectives, or of issues and concerns with service delivery. • RHAs lack the ability to investigate where HSWs missed scheduled service hours and have limited visibility over leading indicators of client safety and service continuity risks. • Issues with SMC service delivery are typically identified during clinical re-assessment or following an adverse event (e.g., service disruption, client safety incident). • Client progress and outcomes monitoring typically involve paper-based workflows. • Client needs are typically re-assessed on an annual basis, or sooner should there be a significant change in the client's health status. Criteria for re-assessment lacks standardization and is frequently based upon client self-identification or clinical judgment on the part of the RHA case manager.
Client Payment Processing	Create Service Authorization Reconcile Invoices to Service Authorization Authorize Payments Conduct Financial Audit	• Client payment authorization involves a manual three-way reconciliation between invoices, timesheets and the service authorization in CRMS. Timesheets and invoices are often paper-based and labour intensive to reconcile. • RHAs lack the ability to independently verify timesheets, and to easily track supplementary client benefits and payments. Quarterly payment reconciliations are labour intensive as a result of paper-based workflows and working across multiple disparate systems. • Transactional client payment processes are duplicated across RHAs, limiting workload leveling and achieving economies of scale.

Program Quality	Monitor SMC Caseloads	• Performance reporting lacks standardization across regions and lacks integration at the provincial level
	Monitor SMC Expenditures	• Producing performance reports from CRMS is manual and labour intensive. • Performance management typically involves caseloads and program expenditures but limited quality indicators (e.g., client satisfaction, clinical outcomes, incidences, service disruption, and institutional placement).
	Monitor SMC Quality Indicators	

Individually and collectively, these issues and challenges adversely impact the Department, the RHAs, clients, their caregivers, agency-based providers, and providers of bookkeeping services in the following ways:

- **Client outcomes:** Supporting un-met needs that are essential for individuals to live independently within the community and client centeredness are among the central tenants of the PHSP. However, the ability of the RHAs to adapt individual client service plans to their evolving needs is impeded by a lack of quality and timely information. Rather than take a proactive and evidence-based approach, the RHAs are forced to be reactive to adverse events or rely upon relatively infrequent clinical assessment processes to support clients in meeting their goals.
- **Financial accountability:** As the Department seeks to maximize the effectiveness and accessibility of community-based programs and service, a high degree of confidence that public funds are being used for the intended purposes is essential. Presently, the lack of independent verification of compliance to service plans represents an unacceptable risk of fraud and financial abuse for a program that exceeds $80M in annual subsidy expenditures.
- **Administration efficiency:** As per the 2016 program review, administration of the PHSP involved over 280 full-time equivalent (FTE) resources across the RHAs. With SMC comprising approximately 40% of the provincial caseload, this represents a significant investment of human resources. However, with resource-intensive paper-based workflows, program staff face a substantial administrative burden and limits to working to their full scope of practice.
- **Program standardization:** Consistency of service delivery across regions, client groups and between agency and SMC remains an important guiding principle for the PHSP. However, oversight of agency-based care has historically exceeded that for SMC, and the risk exists that this accountability gap will widen with the implementation of agency SLAs. The long-term viability of both service delivery channels relies upon concurrent and equivalent action to improve oversight and monitoring. Ultimately, individual client circumstances and needs must drive clients' choice between service delivery channels, not deficiencies in oversight and monitoring.

Policy changes currently being pursued by the Province at the program-level improve various aspects of SMC oversight and monitoring. Most notably, these include:

- Consistent sharing of full clinical assessments with clients, their families, HSWs and other within the client's circle of care;
- The submission of monthly progress reports detailing services provided, fulfillment of client needs, attainment of care objectives, and, concerns; and,
- Progress report follow-up by client contact from the RHAs on a quarterly basis, with at least two in-person visits per year.

While these changes are very important, they are perhaps insufficient relative to the Province's oversight objectives and misaligned to the case management and administrative resources available within the RHAs.

Future Program Oversight & Monitoring Requirements

Given the issues and challenges note above, Table 2 below presents the Province's consolidated future oversight and monitoring requirements. These requirements were refined based on input from Department and RHA stakeholders, and calibrated against draft agency SLAs and preliminary home health technology requirements gathered by the NLCHI. They represent, from the perspective of the Department and RHAs, the minimum attributes of the future oversight model that will deliver the desired level of control, financial accountability and information availability for effective care planning and case management.

Table 2: Future SMC Program Monitoring & Oversight Requirements

Process	SMC Monitoring & Oversight Requirements
Service Plan Development & Coordination	- Provides a central record of a valid funding agreement between client, client delegate and RHA - Provides a client service plan accessible to RHA, client, client delegate and support worker - Verifies client or delegate competency to fulfill the role of an employer - Verifies compliance to applicable employment legislation and standards - Verifies client or client delegate business registration with the Canada Revenue Agency (CRA) - Verifies valid employment contract - Verifies support worker qualifications and competencies - Verifies written HSW job description - Verifies valid bookkeeping service contract (if applicable)
Service Monitoring	- Tracks clients who received the first visit against time of referral - Tracks client need in groups according to complexity of need and type of service required - Identifies clients refused to service and reason for refusal - Tracks client change in health status - Tracks reassessment conducted - Tracks client progress on clinical assessments stated goals in categories of functional dependence, cognitive staging and mobility - Tracks service type and number of hours delivered to client and associated payment - Tracks clients approved service plan hours against actual hours of service delivered - Tracks service integration via referral to other health and community services and refused referrals - Tracks staff turnover - Tracks regional monthly utilization data including volume of clients, services used and per hour usage - Tracks safety incidents

	• Tracks client incidents • Tracks missed appointments
Client Payment Processing	• Ease client burden associated with bookkeeping requirements. • Tracks client invoice timing capturing delays • Allows RHA or HCS to conduct audits on service need, service provided and services billed • Tracks method and precise payment amounts to bookkeeper and HSW • Administers RHA quarterly reporting of service utilization and cost • Tracks supplementary benefits and other allowances • RHA confirmation of place of residence, financial eligibility and proof of formal diagnosis
Program Quality	• Tracks client incidence • Tracks client, family, and support worker concerns • Tracks confidentiality breaches • Tracks workplace safety incidents • Tracks client satisfaction levels • Tracks monthly Regional utilization data including volumes of clients, services used and per hour usage • Tracks client progressed on clinical assessment stated goals in categories of functional dependence, cognitive staging and mobility • Tracks volume of clients with change in health status • Tracks volume of reassessments conducted • Tracks SMC staff turnover

Beyond these requirements that would sustain the viability of SMC as a service delivery option within the PHSP, the Steering Committee also identified the following desirable attributes for the future model of SMC oversight and monitoring:

- **User Experience:** Ease of use and easing of administrative burden across client, support worker, RHA and Departmental users.
- **Financial:** Upfront and sustaining costs, including capital, working capital and operational costs.
- **Integration:** Integration with the wider PHSP, community support services and health system.
- **Ease of Implementation:** Ease and timeliness of implementation.
- **Proven:** An established robust approach to increasing home care oversight and accountability.

These attributes represent important guides for identifying the policies, processes, and technological tools that the Province may wish to consider and pursue in improving oversight of SMC.

Trends in Home Health Accountability

Research into trends in home health accountability was conducted to inform the Province's policy, process, and technology options for improving oversight and monitoring of SMC. Additionally, research efforts looked beyond practices in community-based programs and services to tools and strategies that governments are applying to address complex policy challenges. The research and analysis presented in the following section provides important insights into where the Province should focus its efforts in enhancing accountability and outcomes in SMC programming.

Home Health Oversight & Monitoring in Canada

Given a common federal legislative framework and similarities in health care programming at a sub-national level, Newfoundland and Labrador's Canadian provincial and territorial counterparts are a logical starting point for identifying policies, processes and technologies relevant to improving SMC. As such, this review was informed by research into comparable programs across Canada; which included the review of publicly available policy documents, program evaluations, and, interviews with select program leaders.

Overview of Policies & Practices

From this research, it is evident that Nova Scotia, Manitoba, Saskatchewan and Alberta have SMC options with their home care programs that are administered in a relatively consistent way.   Similar to what is observed in Newfoundland and Labrador, these provinces experience a lengthy and inefficient intake process involving paper, email, fax, and several different information systems.

Nova Scotia, Manitoba[3], and Alberta complete assessments to admit a client into the program. These are followed by periodic reassessments on an annual basis unless there is a change in the client's health status, which prompts an immediate reassessment. Saskatchewan completes an assessment three months after a client has been admitted to the program, following that, no assessments are completed unless there is a flagged change in the client's health status.

All four of these provinces conduct a quarterly reconciliation of clients' bank accounts against subsidy payments paid. These provinces face the same risk

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[3] (Audior General Manitoba, 2015), (Auditor General Nova Scotia, 2017)

of fraudulent reporting that is observed in Newfoundland and Labrador, given that payments are based upon self-reported HSW timesheets. While clients or their care designates authorize timesheets, this is a substantially weaker financial control relative to an independent, objective verification of services.

Accountability Outcomes

Various Auditor General (AG) reviews and program evaluations conducted across Canada have consistently found deficiencies in home care programming, particularly from an accountability standpoint.

Nova Scotia invests approximately $140M per year to support individuals remain living independently within their home and community. The November 2017 Nova Scotia AG report[4] finds that the provincial government is taking too long to address accountability issues in the program. It calls upon the Department of Health and Wellness and the Nova Scotia Health Authority to monitor payments to home care agencies to verify approved service and quality of service, so to ensure contract obligations are being met. The AG recommends the implementation of automated virtual verification systems as a means to address potential fraud and increase program oversight. It also recommends the Department of Health and Wellness establish a complaints system inclusive of resolution tracking, and that the provincial health system develop a common set of indicators to monitor and report on the program.

In 2015, the Manitoba AG[5] reported $4M in potentially fraudulent billing when comparing services approved against services actually delivered. The report called for the Department Health, Seniors and Active Living to identify key provincial home care standards related to timeliness, service reliability and client outcomes. It also required Manitoba's RHAs to review their compliance with these standards and report them to the Department. The Department is required to analyze RHAs statistical, utilization and financial reports. Additionally, the RHAs are required to review their intake processes to avoid unnecessary reassessments and ensure urgent referrals are addressed promptly.

A subsequent program evaluation[6] completed in 2016 confirmed financial accountability challenges, but also provided deeper insights into clinical, service delivery, and performance management aspects of Manitoba's home care program. While the evaluation concluded Self Managed & Family Care to be effective, efficient and an important service delivery option relative to Manitoba's evolving population needs, it also noted:
- Information and communications technologies that lack integration and provide inadequate support for service monitoring, performance management and reporting;
- An increasing need for respite for informal caregivers;

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[4] (Auditor General Nova Scotia, 2017)
[5] (Audior General Manitoba, 2015)
[6] (Toews, 2016)

- Opportunities to enhance support worker training and competencies;
- The need to standardize policies and practices across regions; and,
- Opportunities to pursue greater adoption of tablets and other point of care devices to replace paper-based charting and improve service and outcomes monitoring.

Ontario's AG[7] reports that inconsistency in home care delivery, rising costs, and a lack of accountability, are very concerning. In particular, in instances where the same types of clients are approved, they receive different service hours and types of service. Home care services are without adequate care coordination, monitoring, and reporting. These findings are largely concerned with agency-based care as Ontario is currently conducting pilots of SMC in selected regions. Finally, consultation with program leaders in British Columbia suggest there is a desire to expand eligibility for the Choice in Supports for Independent Living option, but also concerns over financial accountability and control.

Home Health Oversight & Monitoring in the United States

Research into international jurisdictions revealed that countries in Europe[8] and Australia[9] have similar approaches to SMC to Canada whereas the United States (US) has taken aggressive steps to increase accountability in home care. This finding and the overall intent to identify alternative policy, process, and technology options led subsequent research efforts to be focused on the US.

Like Canada, the US is confronted with rising health care costs, and with estimates that health care comprises 20-25% of each state's budget[10], it is of ongoing concern. Government officials have identified potential fraudulent billings in home care services and have targeted this as an opportunity for savings. In December 2016, the Federal Government passed the 21st Century Cures Act, legislating that all states are mandated to use electronic visit verification (EVV) systems for personal care services and home health care under Medicaid. This requirement would replace manual tracking and reporting of HSW visits, the duration of the visit, and the type of service provided, with electronic systems. The HSW reports directly from the clients' home using Global Positioning System (GPS) and mobile devices, and all states must implement EVV system that complies with basic functional requirements by 2019[11].

Basic EVV systems use caller identification or GPS, depending on the vendor selected, to capture in real time:

- Client and provider names;
- Current location;

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7 (Auditor General Ontario, 2015)
8 (Vabo, 2012)
9 (Australian Government, 2017)
10 (Sandata, 2017)
11 (Sandata, 2017)

- Start and end times of service; and,
- Specific types of services provided.

In addition to the basic EVV features, other optional EVV functions include:

- Client service planning;
- Clinical outcome monitoring;
- No show alerts;
- Alerts to Care Coordinators that a provider visit has started;
- Care Coordinator check awake calls for overnight shifts;
- Flagging of variances to the approved visit schedule;
- Flagging of variance if services requested will exceed approved budget;
- Service and budget authorization and linkage between departments during intake and payment processes;
- Caregiver communications (e.g., voice and text messaging, email); and,
- Alerts to agency providers on training or licensing requirements.

EVV systems provide independent verification of program data rather than self-reported manual timesheets, resulting in a reduced risk of fraud. Additionally, the EVV optional functions allow for communication between administrative and clinical processes within the region and between all key stakeholders; including the government, the health organization funder, home care agencies, and the frontline worker.

The clients do not necessarily require a device and are not required to submit hours, given the worker requires a device and the hours are automatically tracked. These passive elements of EVV systems, and home health systems in general represent a significant shift in administrative burden from a client's perspective. HSWs typically will check-in when they arrive at the client's home using an identification code on their handheld device. From the device, the worker also identifies the services provided and checks-out when the visit is ended. This enables the roll-up of utilization and billing data by providers and subsequent reposting to various levels of government.

As previously noted, states in the US have until 2019 to implement EVV but have the flexibility to choose how they proceed. Several states have already made strides in implementation. There are four main models of implementation[12]:

- **State Choice:** State is fully engaged and mandates EVV vendor(s).
- **Provider Choice:** No state involvement; EVV vendor selection is left to agency providers.
- **Managed Care Organization (MCO) Choice:** Minimal, if any, state involvement in EVV vendor selection for MCOs.

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[12] (Sandata, 2017)

- **Hybrid / Open Option:** State selects a preferred EVV vendor while allowing providers to maintain use of compliant systems.

The two main alternatives being State Choice or Provider Choice. See Figure 3 for a depiction of the implementation models and various state approaches to date[13]. With the State Choice option, the states select a single vendor to supply EVV systems across the jurisdiction. The government pays for the technology, and all agencies must use this system; the government also controls and is engaged in the implementation process. The single-vendor approach allows for consistent delivery and reporting state-wide. With the Provider Choice option, agencies must pay for their own EVV systems. The agencies control the implementation timeline while still required to meet the mandated 2019 deadline. This approach leads to some variation in service delivery information and client billing throughout the state. The Hybrid / Open Option and MCO Choice alternatives for EVV implementation are currently only under development.

Legend

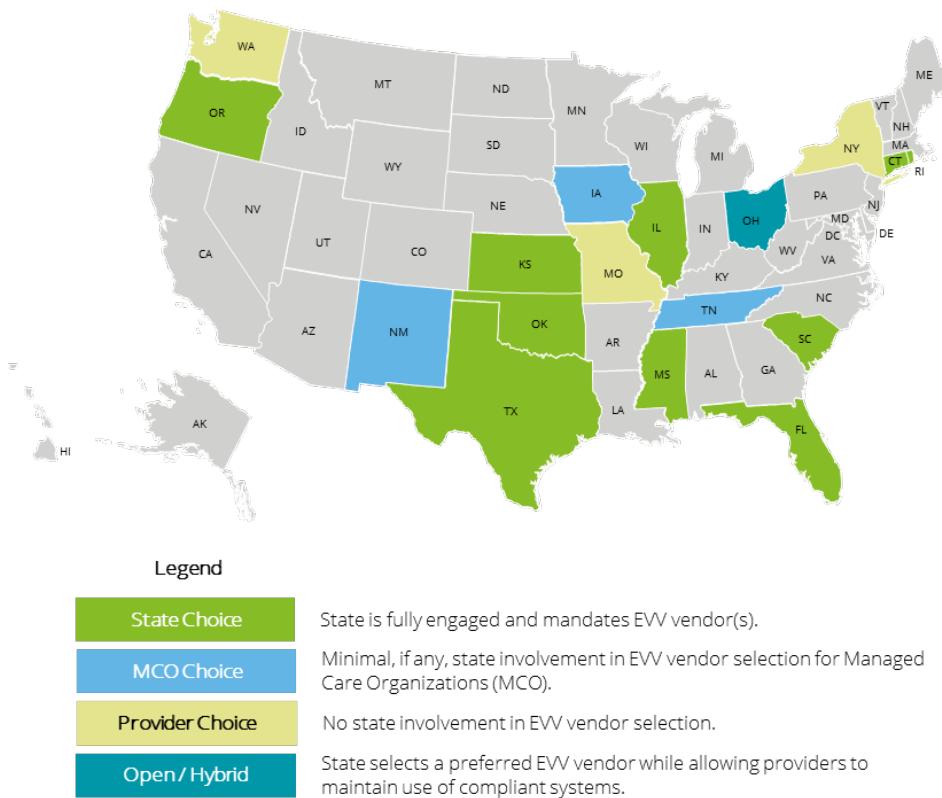|	
State Choice	State is fully engaged and mandates EVV vendor(s).
MCO Choice	Minimal, if any, state involvement in EVV vendor selection for Managed Care Organizations (MCO).
Provider Choice	No state involvement in EVV vendor selection.
Open / Hybrid	State selects a preferred EVV vendor while allowing providers to maintain use of compliant systems.

Figure 3: EVV Implementation Approach by State

There are numerous competitive and experienced EVV vendors in the US. Agencies have been receptive to EVV because of the increased efficiency it offers agency operations, particularly the ability to schedule and manage their HSW workforce. EVV aids human resources in shift planning, service planning, tracking employee locations, and tracking which services were

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[13] (Sandata, 2017)

delivered. More significantly, state governments in the US are interested in the reduced fraud and cost savings possibilities with EVV.

Select states have conducted a cost analysis of home care billings before and after EVV implementation; briefly highlighting these findings:

- Oklahoma reported spending $1,415,513 to implement state-wide EVV in 2010 and has saved an average of $3.7M in each of the next three years.[14]
- Florida conducted an audit of home care billings before and after EVV implementation in the Miami-Dade County. In the first two years of implementation, they observed savings of $19M and $3.5M, respectively.[15]
- South Carolina observed 10% savings to their homecare billings in year one and 7.5% savings in years two and three. Additionally, clinical and financial intake processes were reduced by an average of 12 days.[16]

In all three states publicly reporting financial outcomes from EVV, the key finding was a significant reduction in billed hours of service due to the electronic check-in (time visit started) and check out (time visit finished) feature of EVV.

Technology Enablement

Reviews of Canadian home care programs by the respective provincial Auditor Generals and by other independent parties, and experiences in improving accountability in the US all point to the important role that technology might play in the Province's future oversight model for SMC. Indeed, this would be consistent with a wider trend in the Canadian health care sector and in citizen services delivery in general.

Home Health Technology

In the face of the identified service delivery and oversight challenges, other Canadian provinces are investigating technical enablers to address compliance and outcomes monitoring. Use of mobile devices in health care is increasing as the industry faces challenges of continued resource constraints and increased service demand, associated with the aging population. The need to provide cost-effective, accessible services to Canadians in rural regions has also driven an increase in the use of technology.

There is a particular focus on client-centered platforms accessed through cell phones, smartphones, and personal devices (PDAs). These devices are equipped with the ability to connect through mobile, wireless local area network (LAN), and Bluetooth networks. Based on a review of health technology literature[18] and consultation with subject matter advisors it is

"Expanded technology-enabled home care offers a promising pathway to bend the cost curve for ever-growing health care expenditures. Independent of the economic benefit, the moral value of enabling older members of society to live in grace and dignity in their own homes, with a ripple effect on their caregivers, is arguably the most important—if unquantifiable—benefit of home care."

Kayyali et al. (2011)[17]

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[14] (Lester, 2013)
[15] (Sandata Technologies, LLC, 2017)
[16] (First Data, 2011)
[17] (Kayyali, Kimmel, & Van Kuiken, 2011)
[18] (Canadian Institute for Health Information, 2016), (MacDonald, 2017)

expected that mobile devices with audio, video, and text will be used more frequently for early detection and treatment of patients. These tools will also support appropriate service utilization, particularly allowing persons to remain at home (e.g., 811nursing telehealth paired with other providers such as paramedics, nurse specialists, or general practitioners) and in turn avoid hospital admission, emergency visits, or long-term care admission. Canadian and health technology literature, in general, reflects that mobile devices will be critical to health care providers in the future for:

- Informing consulting, diagnosis, and treatment;
- Medical education and research;
- Conducting quick access to information in shift change environments;
- Chronic disease management;
- Patient empowerment;
- Rapid communication regardless of distance; and,
- Increased efficiency and effectiveness.

Within the home care sector, many Canadian agency-providers are following their US counterparts and increasing adoption of technology, particularly those that feature EVV. In many cases the primary driver is not necessarily improved accountability, but rather an increased their ability to effectively manage their workforce. EVVs inform where employees are in real time using GPS tracking, what service they are providing, and the time and duration of a visit. Some notable examples include:

- AlayaCare's integrated suite of home health technologies that are in use across a number of provinces, and in Ontario in particular;
- Procura by Compliahealth is used by many home care agencies in British Columbia; and,
- eShift by Sensory Technologies is utilized by agencies and Local Integrated Health Networks in Ontario.

These systems allow service providers to track patient goals against approved service plans. They also enable agency operators to plan shifts and collect all data for reporting to the RHA. A scan of available home health technologies reveals there are at least 94 home health software products available in North America[19], many of which were likely developed in response to legislative and regulatory change in the US. There is of course, significant variability in the quality and features of home health technologies as approximately 32 solutions attract high user ratings, and just ten of those that lead the market are considered to be full feature.

The availability and functionality of home health technologies naturally raise the question of how applicable, such tools may be to enabling SMC delivery in Newfoundland and Labrador, particularly from an oversight and accountability standpoint. This important question will be explored further in the following section of the report.

Functionality of Full Feature Home Health Technology Products:

- Billing & Invoicing
- Charting
- Electronic Signature
- Employee Tracking
- Medication Database
- Patient Intake
- Scheduling
- Visit Verification
- Time and Task Reporting

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[19] (Capterra, n.d.)

Breaking Trade-offs

Beyond community-based services, governments in general are continuously faced with demands for increased public accountability, improved service quality and personalization while concurrently minimizing regulatory burden and program expenditures. These kinds of trade-offs, where pursuing one objective (e.g., high policy compliance) can often lead to unintended and undesirable outcomes (e.g., high regulatory and administrative burden) can be difficult to effectively address[20]. Such challenges become even more complex in health and human services delivery where privacy, client safety, and service integration across the continuum of care are additional key considerations.

Many of these traditional trade-offs will need to be overcome for the Province to achieve its oversight and monitoring objectives for SMC. Digital technologies and a specific set of innovative tools and strategies lie at the heart of many public sector efforts to address these challenges. For example[21]:

- The City of Boston utilized customer experience methods and co-design to improve regulatory compliance without adding administrative burden. The City created a digital permitting platform through a hackathon event which guided permit applicants and city inspectors through project-specific permitting requirements and reduced average review time by 20%.
- To improve service quality while also reducing administrative costs, the Australian federal Department of Human Services utilized cognitive technologies, agile development and customer experience methods to develop a virtual assistant for its staff. The assistant, named Roxy, uses machine learning and natural language recognition to answer staff questions about Departmental rules and regulations. She successfully responds to over 75% requests, freeing up supervisor time for higher value activities.
- The California state Department of Public Health and Information has partnered with the Text4Baby mobile app to deliver maternal and child health information that is personalized to pregnant women and new parents, including appointment and immunization reminders. By using predictive analytics, behavioural nudges, and design thinking the department was able to reduce missed appointments and increase immunization rates.

These case examples provide important insights[22] into how tools such as design thinking, customer experience methods, analytics, cognitive technologies, agile development, and behavioural nudges can come together to solve the complex problems inherent to SMC in innovative ways.

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[20] (Eggers, Datar, & Chew, 2017)
[21] (Eggers, Datar, & Chew, 2017)
[22] (Walker & Fishman, 2015)

Summary of Research Findings

In reviewing the status of SMC programming across Canada, trends in home care accountability in the US, and the increasing role of technology in enabling health care and driving innovation in the public sector, it is apparent that technology will be central to a renewed oversight and integrated delivery approach for SMC.

This finding is aligned with the view of the Department and RHAs who believe that without providing clients, their care delegates, HSWs, and RHA case managers with new technology tools:

- Oversight and monitoring processes will continue to be unacceptably labour intensive for all involved;
- The risk of fraudulent billings remains largely unaddressed;
- Limited additional assistance would be provided to the client in fulfilling their role as an employer; and,
- Information silos will be preserved and reporting processes will remain inconsistent and laborious.

That said, introducing new technologies requires careful consideration of solution suitability given the unique attributes of SMC in Newfoundland and Labrador, implementation and sustainment costs, and overcoming barriers to adoption.

Suitability of Home Health Technology

Research into trends in home health accountability in Canada and globally suggest that technology will likely play a central role in advancing oversight of SMC in Newfoundland and Labrador. The following section elaborates on this topic as it discusses the availability and suitability of home health technologies. It assesses the extent to which existing home health solutions can meet the Province's oversight and monitoring requirements, as well as key considerations for developing a system that holistically meets the needs of clients, care delegates, RHA case managers, and the Department.

Solution Availability & Suitability

Home health technology has emerged in the industry as a means of lowering the cost of delivering service while simultaneously bettering clinical outcomes for clients. The types of technology available are wide-ranging in their purpose and have typically been built as point solutions to specific problems within the industry.

The available technology can be broken down into two main categories: software and hardware. The focus of this section will be on the available software. Reseach efforts suggest that along with significant policy changes, software can have the greatest return on investment, with the least capital cost. Hardware solutions also require software systems to run them, therefore without a significant strategy around software, there isn't much to gain with hardware alone.

That said, there is value in having insight into what is available for hardware in the industry today, as that may well be the next logical step once a solid digital system is in place. As such this section will briefly cover hardware towards the end. The types of technology available to the industry have been analyzed objectively, with recommendations held until an overall picture of what is available is understood.

A market scan was completed to gain a deeper appreciation of the availability and functionality of home health technology solutions. There is a very broad range of options available within the home health industry. However, these solutions are typically point solutions built for specific requirements based on

the market needs which unfortunately often do not align fully with the particular needs of Newfoundland and Labrador and its SMC option.

While the research was certainly not exhaustive the analysis concludes:

- No single vendor can provide an out of the box a solution that will meet all the unique requirements of Newfoundland and Labrador's SMC programming.
- The vast majority of vendors are built for the US market as opposed to the Canadian market. The core differences between the US and Canadian health care systems pose a significant barrier to simply selecting an American system and attempting to tailor fit it to the Province's needs.
- Many of the systems available are legacy systems that have likely outlived their usefulness. They are built on software principles that are behind today's standards and certainly aren't futureproof. Some of the areas of concern are hosting options, connectivity channels, integration limitation, and scalability.
- Vendor and solution capability can vary significantly, with relatively few solutions, <15%, rated highly from a functionality and usability standpoint.

Despite these challenges, there remains significant potential to adapt an existing home health technology to meet the Province's oversight and monitoring requirements for SMC. Table 3 below presents an overview of relevant home health technology capabilities[23] and the potential scale of improvement spanning the enablement of clinical decision-making, improved financial accountability, and administrative efficiency.

Table 3: Home Health Technology Oversight & Monitoring Capabilities

Process	Key Activities	Relevant Home Health Technology Capabilities	Nature & Scale of Potential Improvements		
			Clinical Decision-Making	Financial Accountability	Administrative Efficiency
Service Plan Development & Coordination	Confirm SMC Eligibility	• Automatic import and verification of key documents. • Document digitization and optical character recognition • Automatic template service plan creation. • Automatic application of business rules to forms and agreements. • Automatic scheduling based on eligibility.	0	1	4
	Communicate Clinical Assessment		**4**	**1**	**4**
	Create Service Plan		**4**	**1**	**4**
	Create Service Agreement		0	2	4
	Create Funding Agreement		0	2	4
	Verify Legislative Compliance[24]		0	4	4
	Verify Business & CRA Registration		0	4	4
	Verify Contracts		0	4	4
	Verify HSW Qualifications		4	4	4

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[23] Technology capabilities are reflective of leading home health solutions in general; specific capabilities will vary by individual vendor and product.

[24] Incremental oversight and monitoring activities are presented in bold.

	Initiate Services	• Automated eligibility verification tools.	0	0	4
Service Monitoring	**Monitor Service Plan Compliance**	• Automated timestamping of visits and care activities.	4	4	4
	Monitor Client Progress & Outcomes	• GPS location tracking.	4	4	4
	Investigate Incidents	• Notifications based on clinical performance indicators.	2	4	4
	Investigate Non-Compliant Visits		2	4	4
	Review Service Plan	• Automted exceptions flagging (e.g., non-compliant visits, re-assessment triggers).	4	2	4
	Re-Assess Client Needs		4	0	0
	Refer Client to Other Support Services		1	0	4
Client Payment Processing	Create Service Authorization	• Automatic generation of digital forms and invoices.	0	1	4
	Reconcile Invoices to Service Authorization	• Automated reconciliation and exceptions flagging.	0	4	4
	Authorize Payments	• Digital signature and payment auhtorization.	0	4	4
	Conduct Financial Audit		0	4	4
Program Quality	Monitor SMC Caseloads	• Customizable, point-and-click digital reports and dashboards.	2	4	4
	Monitor SMC Expenditures	• Automated report distribution.	2	4	4
	Monitor SMC Quality Indicators		4	4	4

Most notable in assessing the suitability of adapting existing home health technologies to the Province's requirements for SMC is the extent of automation and digitalization relative to the current state. Indeed, this is a recurring theme when looking at various aspects of SMC monitoring and oversight and supports the prioritization of technology enablement over incremental policy and process improvements.

The software systems in the home health industry typically fall into several key subcategories:

- Business Enablement Technology (BET);
- Clinical Enablement Technology (CET);
- Quality Assurance (QA); and,
- Monitoring.

There typically isn't much overlap between clinical software and business software. However, both usually come with some degree of quality assurance and monitoring. The nature of SMC and the Province's policy objectives demands the confluence of all four categories. However, as noted above, there currently isn't an out of the box software solution for SMC, or other Canadian home care programs in the market today.

The vast majority of software in the market is targeted towards the US. There are very few high-quality vendors with systems built specifically for the Canadian market, although there are a select few. The array of systems available are disparate, however, do hold several key themes between them:

- Elimination of repetitive manual tasks;
- Improved efficiencies for their users;
- Improved reporting accuracy;
- Reduced clinical and financial risk and liability; and,
- Optimization of critical path workflows.

Each of the software subcategories is explored in the sections below.

Business Enablement Technology

BET software enables organizations to focus on their primary purpose while minimizing time spent on the mundane administrative aspects of running a business. Common features of these types of software include tax preparation, invoice creation, automatic population of key forms (government or otherwise), reporting, auditing, compliance verification, and, workforce management.

Many systems exist in this space as it is an opportunity for developers to meet the demands of large markets with a small number of programs. BET systems are usually disparate, providing solutions for dissimilar business needs. For example, a business may find a useful workforce management system, but it is unlikely that the same software will simultaneously provide support for invoicing or auditing activities.

That being said, some larger systems exist today that fulfill multiple purposes simultaneously, allowing for features to be selectively chosen. These systems are typically referred to as platforms, as they host many point solutions together on the one piece of technology. The core benefits of platform software are interoperability between solutions on the platform, single licensing, low maintenance, limited integration required, and futureproofing.

However, it is important to note that platforms are not a magic bullet, there are trade-offs which need to be weighed. Platforms can require significant customization for a particular client; they don't typically meet a client's the needs straight 'out of the box.' Upfront design is commonly required between the vendor and client in order to scope their needs and form an implementation plan. This is completed by piecing together and configuring existing vendor components.

Most industries have trended towards platform solutions where possible. For complex projects out of the box point solutions often don't exist and those that do only partially fit specific client needs. They typically come at a lower overall cost of ownership.

Clinical Enablement Technology

CET software enables clinical and occasionally non-clinical, workers to complete their tasks with more efficiency and higher accuracy. There are many types of clinical software in general; however, for the home health industry, the list is shorter.

The relevant CET software for the home health industry include:

- **Fieldworker Software:** Which allows a fieldworker to schedule visits with clients, manage their tasks, fill out electronic charts, and receive instruction from management.
- **Service Plan Software (SPS):** Which allows clinicians to create generic service plan templates. These can be backed by a complex rules engine that will automatically generate a service plan for a client based on all known information (e.g., demographics, scheduling, clinical assessment outcomes, eligibility parameters).
- **Clinical Decision Support Systems (CDSS):** Which are used by clinicians to create digital versions of best practice guidelines and clinical protocols. These systems allow for generic decision support based on client demographics, health status, and many other inputs into clinical services planning and delivery. These systems are used typically in combination with SPS to generate client care plans. The benefit of a CDSS is that they vastly improve the clinical outcomes for clients and patients by ensuring they are always recommended for the best intervention for their needs, according to agreed-upon clinical best practices.
- **Care Plan Software (CPS):** Which allows for the creation of individual care plans for clients. These systems range widely, with different levels of automation. They range from simple electronic forms that are manually filled out by a clinician (i.e., an electronic chart), to a templating engine, to as far reaching as using a CDSS in tandem with SPS to generate the optimal care plan for a particular client automatically.
- **Remote Device Monitoring (RDM):** Which is software that combines with physical devices (e.g., biometric devices like blood pressure cuffs, weight scales, pulse-oximeter, etc.) to monitor the health of a client in real time. These systems typically work with a CDSS as well as CPS to provide preventative healthcare. RDM is relatively new technology; some pilots have been successfully launched in North America, but widespread adoption is currently limited.
- **Virtual Visit Software (VVS):** Which allows for clients that reside outside of a reasonable distance for typical healthcare to still receive clinical services, and has had a lot of success. This type of technology is often associated with telemedicine as it began there, but the two are in fact different. Nurse advice lines are prevalent all over Canada. However, VVS has expanded beyond the simple telephone medium. It now includes real-time video visit software, artificial intelligence (AI) chatbots, AI 'Avatar' telephone calls, text message advice lines, and social media engagement systems. VVS is cost effective as it allows for the routing of care to the least expensive, appropriate channel for the patient. Additionally, benefits of VVS are the provision of healthcare where it might not otherwise be available, and engagement with the younger generation. VVS is a potential avenue of significant provincial savings and improved patient care.

Quality Assurance

QA software has features that enable the management of resources in the field, escalation of key events, as well as the creation and monitoring of SLAs

and other performance measures. These types of software typically allow users to create flags and handle exceptions over a broad range of information. An example of QA software in action would be if a field worker doesn't visit their client despite being scheduled, a flag can automatically be raised and escalated to that worker's manager, case manager, or a client family member via their preferred basic communication channel.

Monitoring

Many industries rely on real-time monitoring and optimization of resources, including shipping, transportation, sales, and justice. Monitoring systems have existed for many years, and generic methods of tracking whether or not an event has occurred (e.g., a field worker showing up for a remote visit) have been vetted for decades. EVV, which was an important concept introduced in the previous section is, in general, a subset of monitoring software. In the home care world, of particular note in the US, it has been a very effective tool to ensure that field workers are actually doing the work assigned to them. It has been very successful for decreasing fraud across the board, while simultaneously creating better relationships between the client, workers and agencies. They also decrease overhead, as less human oversight is required and automatic generation of invoicing and reports can be achieved as a result of these systems.

EVV systems are a small piece of a bigger solution. As was discussed in the previous section, in the simplest form it could provide a digital signature system that allows the client to provide witness that the worker showed up and stayed for the appropriate time. The better systems use a combination of GPS and a mobile application (i.e., tablet or cell phone) to provide real-time tracking of the worker. If connectivity is not an issue, the embedded mobile phone GPS paired with a simple fieldworker mobile application is ideal for EVV.

In the event of challenging network connectivity (e.g., the client doesn't have internet access, or cell signal is unavailable in the area) there are other options. GPS can be achieved with a relatively inexpensive device, an example being SPOT satellite service, and the mobile application can be designed to work offline then synchronize when an internet connection is available. EVV does not typically work alone; it needs to be backed up by quality assurance software and policy. As a component in a broader system, EVVs contribute to the overall wellbeing of a client and support financial accountability.

Delivery Model Options

There are factors besides the software itself that must be also be taken into account, including selecting a delivery method and hardware considerations.

Software-as-a-Service

Software-as-a-Service (SaaS) has emerged as a dominant trend in the home health industry. Essentially, the software is not purchased, rather a recurring payment plan is arranged with a vendor who handles all of the typical challenges associated with owning software (e.g., maintenance, hardware implantation, upkeep, uptime, and, redundancy). One of the most valuable

features of SaaS is that the liability of the software is usually owned completely by the vendor. In this case, the vendor is typically responsible for issues like downtime, data loss, and security breaches that would normally have burdened both the purchaser and the vendor.

Additionally, SaaS is significantly less expensive in terms of upfront cost, and if negotiated properly it usually has a lower cost of ownership. It's also much easier for the purchaser to part ways with the vendor if SLAs aren't met given that fees aren't paid up-front, and there is no large capital investment. SaaS is prevalent in many cloud-based solutions, although it is not exclusive to the cloud.

On-Premise License

Choosing a standard, on-premise license for delivering software is associated with several burdens including expensive up-front cost of implementation, large capital investments, the hidden cost of ownership (e.g., maintenance, upgrades, and security), and sharing of liability. Even so, sometimes these standard license models are a preferred method, especially when they meet legislative requirements, or fit within internal strategic plans. For example, with patient information, a datacenter with a standard license is required in Canada. If one is not available through the vendor, an on-premise install would be required.

Hardware Considerations

Some of the technical solutions available in the home care industry require hardware; specifically virtual visits, EVV, fieldworker software, and remote device monitoring. The different hardware ranges in price, availability, suitability, and quality. To minimize costs, instead of purchasing hardware, strategies exist to use existing hardware wherever possible. For example, most people today own a cell phone, therefore having an application that works generically across common phone brands can drastically reduce costs. Targeting Wi-Fi connectivity where available is another valid consideration for cost reduction.

Key Local Considerations

When considering technology enablement of SMC in Newfoundland and Labrador, the province's attributes and limitations must influence and guide the decision, in order to ensure a suitable match. Geography, population density, connectivity, population demographics, integration, and the technical ability of client users are all important considerations.

Geography & Population Density

Newfoundland and Labrador is a vast province with many towns connected by a single road; this makes contact between residents, in a health care sense or otherwise, considerably more difficult than in other Canadian and international jurisdictions. Any software chosen to aid SMC must account for the vastness of the province. For example, scheduling systems could aid in route optimization as a means of reducing overall cost, and VVS coupled with other systems could help in bridging the gap between remote locations and provide better care for clients.

In terms of population density, it is of great significance that the province has a few dense urban areas coupled with vast areas of low density. In many of these low-density areas, where agency-based care is simply not viable, SMC the only available option. The chosen software must account for this, both clinically and through the strategic use of resources, in the form of service plans, care plans, and scheduling.

Connectivity

Relative to the vastness of Newfoundland and Labrador, the province has significant network connectivity overall. However, there may be some cases of low connectivity in more remote regions, which needs to be addressed by the chosen technology. The technology should provide an 'Offline First' design. There exist solutions that work completely offline, synchronizing when connectivity becomes available. A key consideration of this type of solution is that offline applications store client data on the device itself; given that client health data is highly sensitive information, it must be ensured that the chosen software meets all privacy and security requirements.

Population Demographics

The Province is faced with an aging population that has some of the highest rates of common morbidities such as diabetes, obesity and congestive heart failure. This places a particularly important emphasis on improving clinical outcomes and the health of clients in general in order to drive down the burden on the health care system.

Integration

The Province has many different software systems that span the continuum of care, both for clinical and financial applications. Integration with these systems will be particularly difficult and will require a guiding technology strategy. There are several solutions available which put a focus on interoperability, integration architecture, and cohesiveness between systems. The most coherent solutions are built on platforms which can have more than one application built within the platform and allow all applications in the platform to communicate without expensive integrations.

User Needs

Finally, it is highly important that the chosen software is accessible to the broadest possible audience. Specifically, it should be accessible to different levels of technical literacy and ability. User-centered design should be considered to capture what is acceptable from a graphical user interface perspective. Ideally, the system will require little to no interaction with the client or fieldworker to limit any accessibility issues. Such software does not presently exist, however, with customization there are vendor solutions that could meet this need. Home health technologies have been designed around the need and capabilities of agency-based users. SMC clients possess distinctly different requirements and user-attributes (e.g., setting-up and operating a small business, technological maturity, and potentially impaired cognitive functioning) that an effective solution needs to be designed around.

Summary of Suitability Analysis

The research and analysis concluded that there are many solutions available today, but unfortunately, there are very few that meet the needs of the province to a reasonable degree. Furthermore, there appears to be no single solution currently available that meets all requirements without customization.

It is likely that an amalgamation of several solutions will be required to meet all the needs of the SMC program, or complex tailoring of a leading solution to fill in the gaps. That said, there are proven examples of all the proposed requirements of SMC within some solution used in industry today.

Recommendations

With oversight and monitoring requirements defined, Canadian and global trends in accountability analyzed and the suitability of home health technology solutions assessed, the following section outlines recommendations for the Province's future oversight and integrated delivery approach for SMC. It discusses various key design decisions for the future model and the rationale for the recommended approach. Further, it lays forth considerations for implementing and operating the model.

In analyzing the Province's oversight and monitoring requirements for SMC, it is evident that the desired program control and consistency with agency-based care cannot be achieved through policy and process changes alone. Moreover, existing home health systems that are in use by agencies within Canada appear to have the requisite functionality, with adaptation, to meet the needs of the Department and RHAs in monitoring clients who manage their care.

The introduction of new technology tools for SMC clients, HSWs, RHA case managers, and, client designates will, therefore, be a central element to the future model of SMC oversight. This, however, raises the following important questions:

- What attributes should the technology tools possess?
- How will consistency with oversight for agency-based care be achieved?
- How will the technology be funded?
- What will happen with policies and processes?

The following section explores these important questions and defines a recommended future model of SMC oversight that:

- Enhances the experience of clients, HSWs, RHA case managers, and, provincial policy-makers and reduces administrative burden;
- Minimizes the upfront and sustaining costs of attaining the desired level of oversight and control;
- Integrates with the wider PHSP, adjacent community-based programs and supports and the provincial health system; and,
- Is proven, robust and relatively easy to implement in a timely fashion.

Furthermore, it also outlines key implementation and operational considerations for the recommended model.

Future Integrated Oversight & Monitoring Approach

Defining the recommended future model for SMC oversight and monitoring involves the careful evaluation of a range design choices across five key elements as defined in Table 4 below.

Table 4: SMC Oversight & Integrated Delivery Model Design Choices

Model Element	Design Choices
Licensing & Service Delivery	• Traditional • Cloud-Based SaaS
Scope & Degree of Integration	• Point Solution • Platform
Implementation Approach	• Province Choice • Provider Choice • Open / Hybrid
Funding & Financial	• Government • External Users
Policies & Processes	• Eliminate • Streamline • Migrate • Consolidate • Digitize • Automate

Licensing & Service Delivery

Home health technologies, and citizen-centered technologies in general are seeing an increasing trend toward cloud-based Software-as-a-Service (SaaS) models. Under this approach, a cloud-hosted application would be licensed on a subscription basis, for specific Province defined features. RHA case managers, clients, HSWs, and others within the client's circle of care would access the application through web-browsers and mobile devices. Distributed hosting, application maintenance, and security would be the responsibility of the technology vendor.

Further, the licensing and subscription fee structure would be negotiable between the Province and the solution provider and may be based upon a range of usage parameters including total users, daily active users, login volumes, and transaction volumes. The Province would have discretion over configurable features and functionality and development costs would be amortized in subscription fees.

In contrast, a traditional licensing and service delivery approach would involve hosting the application on government server infrastructure and outright purchase of a perpetual license. Typically, this would also involve on-going support fees. The Province would be responsible for implementation and ongoing application maintenance, including security. From a functionality standpoint, the Province would get access to a broad set of standard features, which would likely require significant investment to customize.

In considering the Province's objectives, technology trends, and the available home health solutions, a cloud-based SaaS approach is recommended based on the following rationale:

- Improved ability to design and deploy a solution that is fit-for-purpose for SMC;
- Faster implementation time;
- Lower total cost of technology ownership with hosting, maintenance and security the responsibility of the vendor;
- The subscription-based model, whereby development costs are amortized, aligns with the Province's current financial constraints; and,
- It aligns with the availability of leading solutions in the marketplace and vendors' preferred model.

Scope & Degree of Integration

In pursuing technology enablement of SMC, the Province has substantial latitude in solution scope and the degree of integration. A point solution would entail discrete fulfillment of the Province's oversight and monitoring requirements and at the exclusion of other aspects of community support services and the needs of other user groups (i.e., clients, care delegates, HSWs). For example, the Province has the option to focus exclusively on implementing EVV within SMC, using limited technology to complement other ongoing policy and process improvement efforts.

Alternatively, a platform oriented strategy would consider not only the Province's immediate accountability needs in SMC but also how technology capabilities may be progressively expanded to support other aspects of care management and integration with other community programs and services. A platform approach would include the potential to:

- Establish a common technology system across SMC and agency service delivery channels;
- Expand functionality to support individualized funding within the PHSP; and;
- Support an expanded suite of programs and services delivered in the community, such as rehabilitation, chronic disease prevention and management, wound care management, and renal programs.

As integration with the wider PHSP, community support services and the health system and financial feasibility are among the Province's key desirable attributes for the future model for SMC, a platform approach is recommended. The alternative, pursuing a point solution that is highly specific to SMC would, by its very definition, lack integration with the wider program. Furthermore, this approach would perpetuate information silos, create redundant interfaces, and be relatively costlier to design, deploy and maintain.

With the intent of future proofing the selected model against evolving population needs and health system goals, the Province would ideally select a

home health technology that offers scalability beyond the immediate needs of SMC oversight and monitoring.

Implementation Approach

Review of home health technology implementations at the state-level in the United States reveals the following three distinct approaches that are relevant to Newfoundland and Labrador:

- **Province Choice:** The Province selects and mandates a single, common home health technology solution.
- **Provider Choice:** No Province involvement in the selection of home health technology in delegated service delivery. Providers, i.e., agencies and SMC clients, maintain exclusive rights in vendor selection.
- **Open / Hybrid:** The Province selects a preferred solution and vendor while allowing providers to maintain use of compliant systems.

In evaluating these model design options, it is essential to consider concurrent improvement initiatives within the PHSP. Efforts to improve oversight of agency providers and to identify agency technology standards, a collaborative effort between the Department and NLCHI, bring the following important considerations:

- **Program standardization:** As previously mentioned, harmonizing oversight requirements across PHSP service delivery options is an important goal that the Department is pursuing. The approach taken by various states in the United States, including Oregon, Texas, Oklahoma, Florida, South Carolina, Kansas, Mississippi, and Illinois, of selecting a state-mandated system was done so in part to drive standardization and consistent reporting.
- **Agency adoption of SLAs:** As part of implementing the 2016 program review recommendations, the Province is proceeding with introducing SLAs for agencies which represent a significant step in accountability and oversight. That said, current technology adoption varies significantly across agencies, and there is concern about the ability of some providers to meet the Department's increased expectations in a timely fashion. A common home health system, or common standards at a minimum, would aid agencies in fulfilling their future service level obligations.
- **Economies of scale:** It is important to keep in mind that Newfoundland and Labrador is a relatively small sub-national jurisdiction, with a population of approximately 520,000, a figure that is expected to decline in the coming years. Multiple home health systems within a small sector may result in inefficient and costly duplication, costs that will ultimately be borne by the Province. Furthermore, multiple small-scale systems may also dilute purchasing power and be a disincentive to technology vendors innovating to meet the Province's needs.

With these considerations in mind, it is recommended that the Province select and mandate a single home health technology solution (i.e., Province Choice), with an Open / Hybrid model the preferred alternative. This approach is preferred as it:

- Provides the Department and RHAs with the level of consistent oversight they are seeking across SMC and agency care;
- Supports agencies meet SLAs, particularly those that are relatively small or currently make minimal use of technology in service delivery; and,
- Reduces the cost to the provincial home care sector of meeting to the Department's accountability expectations.

While this may be a major departure from current practices, the alternatives cannot be justified for a jurisdiction of such a relatively small size and the overriding need to find the most cost-effective means to achieve the desired level of consistent oversight and accountability.

Funding & Financial

The establishment of a province-mandated home health technology system naturally raises the question of funding responsibility. For this model element, the Province has the choice to follow the precedent established by US states and to fund the system or to seek cost recovery, either full or in part, from external users.

In assessing this design choice, it is important to consider the expected financial benefits and to whom they will accrue. Financial benefits for a home health technology system are expected to include:

- **Savings in program subsidies from reduced fraud:** As noted above, US states such as Oklahoma, South Carolina, and Florida have reported annual savings from home health and EVV implementation of 7.5% to 10%. This magnitude of improvement potential is consistent with independent analysis completed by home care agencies in Newfoundland and Labrador, as noted in the 2016 program review. Given this and with current PHSP expenditures of approximately $200M per annum, home health technology has the potential to deliver $15M to $20M in annual savings to the Province. The expected financial benefits for SMC are $6M to $8M per year, assuming SMC remains approximately 40% of the total PHSP caseload. As the Province is the sole funder of program subsidies, it will be the beneficiary of savings from reduced fraud.
- **Savings in administration resource from operational efficiencies:** The opportunity to reduce administrative burden is a consistent theme throughout the 2016 program review and assessment of SMC specific practices. Indeed, the analysis presented in the assessment of home health technology suitability above suggests significant opportunities exist to digitize and automate processes that are currently paper-based and resource intensive. From an RHA perspective, over 280 FTEs are currently dedicated to administering

the program, with many more involved administrative aspects of the program across agencies and SMC. At this level of investment, even modest operational efficiencies will result in material savings. For example, a 5% improvement, or just 24 minutes saved on administrative tasks per day, among RHA program staff would result in savings of over $1M per annum. While the RHAs, SMC clients, and agencies, would all benefit from operational efficiencies, the RHAs would benefit disproportionately by their relative size and involvement in all aspects of program delivery.

Furthermore, it is necessary also to consider the ability of external parties to contribute to funding a system. Under current service reimbursement rates that are set by the Province and wage rates that are negotiated by the Province and the union representing HSWs, agency-based providers currently operate with a gross margin of approximately 15.6% per hour. Compared to other private sector businesses and the fixed costs associated with operating an agency, current margins can be considered modest. As such, the full incremental cost associated with a government-mandated technology system would be likely difficult for agencies to absorb in their current cost structure. Furthermore, by meeting financial eligibility criteria for the PHSP, the ability for SMC clients to contribute to technology costs is also challenged.

One final, but important financial and funding consideration is the expected cost to design, implement, and sustain a technology system. Unfortunately, given the nature of innovation required to adapt an existing solution, unknown level of vendor interest in partnering with the Province, and licensing model permutations, it is premature to provide cost estimates at this point. That said, the implementation approach presented in the following section includes a number of stage-gates where the Department can assess financial feasibility with the appropriate information and vendor engagement.

On balance of these factors and the prevailing fiscal climate, it is reasonable to conclude that the Province should be the primary, but non-exclusive, funder of home health technology. The Province should explore appropriate cost sharing arrangements with home care agencies and other external entities once technology vendors are engaged and platform costs are estimated.

Finally, the opportunity may exist to leverage Federal government investment in the development and deployment of a common home health platform. Indeed, the approach recommended to the Province aligns well with a current strategic priority of Canada Infoway of supporting Canadians access their health information through expanded platforms.

Policies & Processes

Assessment of the suitability of home health technologies to fulfill the Province's requirements for SMC demonstrates significant potential to digitize and automate key processes and activities. Indeed, automation

> ## Connect Canadians to their Health Information
>
> "Infoway will launch a new program to expand Canadians' access to their health information through their preferred digital device. To accomplish this, we will establish and expand patient platforms across Canada by leveraging and nationally scaling the kind of capabilities available in a number of jurisdiction patient health platforms."
>
> Canada Health Infoway,
> Corporate Plan (2017-2018)

wherever possible, and digitization where it isn't should be considered a prevailing philosophy within the review recommendations. By automating as much as possible, the Province will decrease administrative overhead, drive accountability, sustain and strengthen the client-case manager relationship. This, in turn, will underpin important improvements in clinical outcomes.

However, there remains incremental policy and process improvements that the Province should consider to further strengthen oversight of SMC and reduce administrative burden.

From a policy standpoint, these include:

- **Progressive development of the level of detail and quality of client progress reporting:** As noted earlier, mandating the submission of monthly progress reports detailing services provided, fulfillment of client needs, attainment of care objectives, and, concerns is a key policy initiative being pursued by the Department. The first iteration of standard progress reporting is focused on gathering basic information from the clients' support worker. As implementation of the policy matures and its administration appropriately supported by technology, the opportunity exists to progressively advance the level of detail in progress reporting and strengthen the link to factors that truly underpin the attainment of client outcomes.
- **Progressive increase of client contact and in-home RHA case manager visits:** As resources become available through the realization of operational efficiencies, the opportunity may exist to increase client contact beyond the planned quarterly policy target. Moreover, the communication, coordination and telehealth capabilities inherent within many leading home health technology systems will naturally drive increased client and case manager contact.

From a process standpoint, these include:

- **Consolidation of bookkeeping services in select, qualified providers:** As noted above, the RHAs currently have no involvement in the selection and contracting of bookkeeping services. This degree of client choice comes with the risk that an underqualified bookkeeper may be engaged to support management of client financial affairs. By identifying an approved list of qualify bookkeepers, the Province will further strength controls and minimize risk in SMC service administration.
- **Consolidation of client payment processes activities:** Consistent with the Newfoundland and Labrador Health Shared Services Strategy, client pay, is a highly transactional activity that is conducive to consolidation to realize processing efficiencies through economies of scale.
- **Migrate compliance verifications to non-clinical staff:** Many verifications defined in the Province's oversight and monitoring requirements (see Table 2) such as compliance to relevant legislation

and regulations, and CRA business registration are of a non-clinical nature. Wherever possible, these tasks should be delegated to paraprofessionals to allow Social Workers and Community Health Nurses work to their full scope of clinical practice.

Summary of Future Model Recommendations

In summary, the recommended future oversight and integrated delivery approach for SMC builds upon the existing PHSP policy framework by Department and RHAs:

- Working with the NLCHI to design and deploy a scalable and integrated cloud-based home health care SaaS platform, modified to meet the Province's SMC oversight and monitoring requirements;
- Mandating the use of a common and standardized home health system across agency and SMC service delivery channels within the PHSP;
- Assuming primary responsibility for funding the common home health system with the understanding that the Province will be the primary beneficiary of improved oversight, reduced fraud, and administrative efficiencies; and,
- Continuing to pursue complementary incremental policy and process improvements in SMC programming.

These changes represent a significant departure from current practices, but they are, however, necessary for the Province to meet its policy objectives and goals. Furthermore, it is worth noting that such an approach is without precedent across Canadian provincial and territorial jurisdictions in its totality.

Newfoundland and Labrador is presented with the unique opportunity to lead Canada in efficient, effective, accessible and accountable self-managed care.

While this might create a degree of apprehension among many stakeholders, the future model for SMC oversight is built from individual elements and design choices that have been tested and validated in other global jurisdictions, the private home care sector and other areas of public sector policy and citizen service delivery. This is often the shape that policy innovation takes when governments seek to address complex problems in times of resource scarcity and increasing citizen expectations.

Implementation and Operational Considerations

The design and implementation of the future SMC oversight model and integrated delivery approach can be thought of a following a philosophy of "think big, start small, scale fast." With the preceding section outlining the recommended future end-state, the focus of these report will now turn to the approach the Province should take in making this ambitious step forward.

Guiding Principles

Recommendations to implement and operate the proposed future model for SMC are shaped by the attributes identified by the Steering Committee as important (e.g., user-experience, cost-effective, timeliness) as well as wider public sector trends. On this later point, inspiration has been drawn from various leading strategies, and tools governments are increasingly leveraging to deliver technology-enabled citizen services such as:

- **User-Centred Design:** A design process in which usability goals, user attributes, situational and environmental characteristics, and critical tasks are extensively analyzed and validated iteratively in the development of new products and services. Maximizing convenience, usability, and alignment to user-specific requirements are key objectives of the design process.

- **Customer Experience (CX) Methods:** Beyond specific interactions, functions, and tasks, CX methods seek to maximize customer, and in this instance client, engagement and experience across the full breadth of touchpoints with a service, product or program. Once again, the goal is to place client needs at the center of the design process.

- **Agile Development:** A framework for software development that emphasizes collaboration within cross-functional teams, early prototype delivery, iterative development, and continuous improvement. A common feature in agile processes is the rapid development of minimum viable products (MVP), a design with sufficient features to satisfy early users, as a means to test and validate user requirements.

- **Procurement by Co-Design:** A model of competitive procurement for innovative solutions that focuses on collaboration, shared value creation, and outcomes. Procurement by Co-Design arose in response to the limit traditional procurement processes pose to solving novel and complex challenges, particularly in sectors such as healthcare[25]. Pioneered by the MaRS Discovery District in Ontario, it is an emerging model that offers healthcare providers the unique opportunity to participate in the design of innovative solutions before procuring them.

Implementation Approach

Implementation of the future model of SMC oversight and accountability should ideally take an iterative and progressive approach involving the following phases:

1. **Design:** This phase involves the design and development of the technology solution that is necessary to support the Province's SMC oversight and integrated delivery objectives. It includes solution prototype development, a competitive procurement process, and

What is the Procurement by Co-Design Program?

"The program introduces an innovation procurement approach that enables healthcare providers to procure innovative service and technology solutions using design challenge principles. In contrast to traditional procurement, providers seek solutions by publicizing a Challenge Brief that vendors can respond to. Following vendor selection, providers and selected vendors work together in a design and prototype phase to co-design then evaluate solutions, leading to a procurement decision (positive or negative). It allows providers to collaborate with one or more vendors and work together before a procurement decision is made."

MaRS Health Procurement by Co-Design Program Guide

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[25] (MaRS)

refinement of financial estimates, leading to a decision-gate for pilot solution deployment.

2. **Deploy:** Following solution design and the validation of requirements, the Province would proceed with a pilot deployment to a select cohort of SMC clients. This would allow the Province to further test and refine the robustness and usability of the technology solution before full-scale implementation.

3. **Scale:** Upon a successful pilot deployment, the Province would then look to progressively expand technology adoption to the full SMC caseload as well as agency providers. Furthermore, following a scaled technology deployment to the PHSP, the Department and RHAs attention can turn to continuous improvement of policies and processes and the potential expansion of technology to support individualized funding within the PHSP and adjacent community-based programs.

Table 5 below provides recommended detailed steps and further supporting rationale for the three phase approach to implementing and operationalizing the future state model.

Table 5: Recommended Implementation Approach & Supporting Rationale

Phase	Steps	Supporting Rationale
1. Design	A. Gain hands-on experience with the functionality of home health care technology solutions by soliciting multiple vendor demonstrations.	• The Department and RHAs have had limited practical exposure to the capabilities of home health technologies; demonstrations will aid in building awareness and understanding.
	B. Conduct further collection of user (e.g., SMC clients, client designates, HSWs, and, informal caregivers), functional, and technical requirements (e.g., integration, privacy standards).	• Presently, detailed requirements for SMC are significantly focused on achieving the Province's level of service delivery oversight. • These are undoubtedly important requirements. However, further work is necessary to define requirements that drive usability, and appropriate integration with other systems in the provincial health sector. • Importantly, these requirements include supports to SMC client in managing their business obligations and standards related to the protection and privacy of health information.
	C. Undertake a competitive Procurement by Co-Design process to: • Validate and refine requirements; • Confirm the viability of adaptizng home health technology to meet the Province's policy objectives; and, • Select qualified vendors with the requisite technology and organizational capabilities. This process would consist of: • Soliciting and evaluating responses to problem statement focused challenge briefs, either on an open or invitational basis.	• While the capabilities of home health technologies are relatively well aligned to the Province's needs, innovation is required to adapt existing solutions for SMC programming. Designing technology solutions specifically for SMC is novel for both the Province and home health technology vendors. • Furthermore, the Province seeks a solution that is fit-for-purpose, cost-effective and can be implemented quickly (ideally, concurrent to the establishment of agency SLAs).

		• Formation of collaborative, cross-discipline teams comprising of users (e.g., clients, client delegates, and RHA case managers), and vendor staff (e.g., designers, solution architects, and programmers). • Discovery and ideation whereby requirements are discussed, reframed, concepts developed, and desirable outcomes refined. • Rapid solution prototyping, testing, iteration, and validation. • Final evaluation of prototype solutions and assessment of vendor competencies.	• Given the nature of innovation required and the Province's priorities, Procurement by Co-Design is preferred over a traditional procurement process. • Procurement by Co-Design will provide the Province with the opportunity to gain confidence that home health technology will meet its needs while minimizing investment and risk. • Furthermore, the competitive tension inherent to such a process will incentivize co-investment and innovation among participating vendors. • Finally, the recommended process allows the Province to assess vendor capabilities, not by reading paper-based proposals, but through shared working experiences.
	D.	Conduct further quantitative analysis to refine and validate expected financial benefits (e.g., improvements in reduced fraud and operational efficiencies) relative to estimated technology costs.	• The Procurement by Co-Design process will reveal further insights into the magnitude of potential improvements and estimated technology costs. These factors should be carefully weighed before proceeding to a final procurement decision.
		Decision Gate 1: Proceed with SMC pilot solution deployment.
	E.	Define the Province's preferred SaaS licensing model and establish a contract for pilot deployment with the preferred vendor. It will be important for the preferred vendor to possess both the requisite technology (i.e., an adaptable, scalable, cloud-based platform) and organizational (i.e., clinical and business) capabilities to be an effective strategic partner. Depending on the outcome of Step 1.C, this may include engaging multiple qualified vendors, on a competitive, concurrent basis. Furthermore, the Province should: • Seek to tie vendor subscription fees to defined service-level and outcomes attainment; and, • Explore establishing an ongoing intellectual property interest in the SMC enabling technology.	• As previously discussed, a subscription-based licensing model is the recommended approach. However, the specific commercial arrangement will be subject to negotiation between the Province and the preferred vendor. • Tying SaaS licensing fees to service level expectations and outcomes attainment will foster co-investment and risk-sharing between the Province and the vendor. • Furthermore, given the state of SMC program accountability across Canada noted in the jurisdictional research, home health technology vendors are presented with a wider market opportunity that should motive investment in Newfoundland and Labrador. • As such, the Province may seek to leverage its own investment in SMC technology and gain recurring revenue to offset other program costs.
2. Deploy	A.	Conduct further agile co-design to establish a minimally viable product for SMC. Again, co-design should ideally involve a collaborative cross-discipline team comprised of users. Pilot development should ideally span the client journey through the program and focus on enhancing user-experiences at every touchpoint. The development sprint for a MVP is expected to take up to eight weeks to complete.	• Applying agile, user-centered design across the client journey will help drive a usable, fit-for-purpose solution and reduce risk. • Directly engaging clients and other users in the design process is among the most effective approaches to mitigating change resistance.
	B.	Design, prepare and launch a pilot solution with a select cohort of SMC clients. Pilot participants should ideally be selected within a RHA or client	• Pilot deployment is an effective means for the Province to test solution viability and gather

	cohort who demonstrate sufficient change readiness. Pilot deployment should ideally target up to 100 users and span six to eight weeks.	valuable user feedback while concurrently minimizing risk. • Furthermore, pilot participants will likely become important change champions for a full-scale implementation.
	C. Evaluate pilot deployment outcomes, and, as necessary, gather user feedback and refine the technology solution.	

Decision Gate 2: Proceed with full-scale SMC solution deployment.		
	D. Review, refinement, and extension of the SaaS licensing agreement. This may include changes to the funding model and cost-sharing arrangement with external parties.	• Full scale SMC solution deployment will impact usage parameters, so the SaaS licensing agreement will need to be amended accordingly.
	E. Design, prepare and launch full-scale implementation of technology for SMC clients. This step includes: • The development and delivery of user education and training; • The proactive identification and mitigation of change management risks; and, • Providing on-going post-implementation support to users.	• Phasing implementation of technology to support SMC prior to addressing agencies allows the Province to demonstrate its commitment to equitable oversight of PHSP service delivery channels.
	F. Monitor solution implementation, quantify improvements in program effectiveness and efficiency and pursue complementary policy and process improvements.	• Per the recommendations above, increasing the use of technology in SMC oversight is prioritized over further incremental policy and process improvements due to the extent to automation potential.
3. Scale	A. As required, conduct further collection of agency user (e.g., agency clients, agency care coordinators, and administrators), functional, and technical requirements and conduct further agile co-design to establish a minimally viable product for agency providers.	• Similarly to Step 1.B, the unique needs of agencies need to be recognized and understood in the pursuit of a common provincial home health platform. • While home health technologies were designed for agency use, there are likely important localized requirements (e.g., legislative, regulatory, service-levels, and reporting) that require definition.
	B. Conduct further quantitative analysis to refine and validate expected financial benefits (e.g., improvements in agency scheduling, operational efficiencies) relative to incremental estimated technology costs.	• Similarly to Step 1.D, the Province should take advantage of the opportunity to reassess the benefits and cost of incremental solution functionality prior to pilot deployment.

Decision Gate 3: Proceed with agency pilot solution deployment.		
	C. Design, prepare and launch a pilot solution with a select partner agency. Pilot deployment should ideally target up to 100 users and span six to eight weeks.	• Pilot deployment seeks to reduce risk, refine the solution, and create change champions.
	D. Evaluate agency pilot deployment outcomes, and, as necessary, gather user feedback and refine the technology solution.	
	E. Develop policies supporting a provincially mandated home health system and revise agency SLAs as required. This policy development includes technology cost-sharing arrangements or opt-out fees the Province may wish to pursue	• Driving adoption of the recommended common platform will require incremental policy changes and potential revision of agency SLAs.

	following the evaluation of financial benefits from the pilot deployment.		
	Decision Gate 4: Proceed with full-scale agency solution deployment.		
F.	Review, refinement and extension of the SaaS licensing agreement.	•	As per Step 2.D.
G.	Design, prepare and launch full-scale implementation of technology for agencies. This step includes: • The development and delivery of user education and training; • The proactive identification and mitigation of change management risks; and, • Progressive roll-out based on agency technology maturity. • Providing on-going post-implementation support to users.	•	By phasing roll-out by agency technology maturity, the Province has the opportunity to simplify implementation while concurrently accelerating benefits realization.
H.	Monitor solution implementation, quantify improvements in program effectiveness and efficiency and explore technology enablement of other PHSP policy initiatives (e.g., individualized funding, outcomes-based funding) and adjacent community-based program and services. Expansion of platform capabilities should follow a defined set of priorities for community support services and maintain an agile and iterative approach. This includes: • User-centric requirements definition; • MVP development through co-design processes, typically in four to six-week sprints; • Pilot deployment and solution refinement; • Pilot evaluation and the analysis of incremental benefits and costs; and, • Full-scale deployment.	• •	By engaging a vendor who brings an adaptable, scalable, cloud-based platform, the Province has the flexibility to expand technology capabilities without strategic and program priorities being well-defined from the outset. This step represents operationalizing this flexibility through progressive and agile development, consistent with the approaches taken previously.

Summary of Implementation Recommendations

The recommended approach to implementing the future model of SMC deliberately includes many elements designed to reduce delivery risk, minimize up-front government investment, align various stakeholder groups, and most importantly enable user adoption. Given the technology focus, implementation of the recommended model will require the support of the NLCHI. Further, the support of dedicated project and change management resources, as well as integration with the wider set of improvement initiatives being pursued for the PHSP will also be important elements for a successful implementation. Without visibility into current resource levels, allocations, priorities, and the Department's intended timeline, it is difficult to determine the scale of supports needed.

User-centred design features heavily in the review recommendations as a key tactic for driving adoption by clients and other users. This approach should also be complemented with user-education, training, deliberate pilot participant selection and be governed by an overarching change

management strategy. While the challenges of introducing new client-centered technology should not be understated or underestimated, research conducted by Canada Health Infoway suggests there has never been a better time to advance a digital agenda. Canada Health Infoway's most recent public survey[26] indicates:

- Digital health awareness is at an all-time high;
- 96% of patient respondents believe it is important for the Canadian health care sytem to take full advantage of digital health tools and capabilities;
- Having online access to their health information online helps Canadians feel more confident in the care they receive and improves their confidenece in self-management of their own health.

These sentiments within the client community and the clear need for new approaches to addressing the Province's rising health care expenditures create a positive climate for evolving the approach to SMC oversight, monitoring and delivery.

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[26] (Canada Health Infoway, 2016)

Concluding Remarks

The availability of an accountable self-manged delivery option with the PHSP is an important element of a sustainble, accessible, and effective program, particularly given the increase in demand for home supports expected in the coming years. By transforming the oversight and integrated delivery approach for SMC, the Province has the opportunity to:

- Improve case management and provide the dedicated and hardworking RHA case managers with the information necessary to make timely, proactive, and evidence-based decisions the drive improved client outcomes;
- Maintain confidence that public funding is being used for the intended purposes and those citizens with the highest unmet needs receive the appropriate supports;
- Harmonize oversight and monitoring expectations across PHSP service delivery channels; and,
- Improve operational efficiencies across the RHAs and enable a shift from administrative case management activities to high-value clinical tasks and direct client engagement.

This course of action provides the Department and RHAs to not only lead SMC programming across Canada, but to also a positive example across the Provincial government on the value of citizen-centered digital technologies.

Appendix

Stakeholders Consulted

Organization	Stakeholder	SMC Steering Committee	PHPS Advisory Committee
Department of Health & Community Services	John Abbott – Deputy Minister	-	4
	Annette Bridgeman – Director, Regional Services	4	4
	Andrew Wells – Director, Medical Services	4	-
	Pam Barnes – Program Consultant	4	-
	Deanna Waddleton – Program Consultant	-	-
	Joanne Rose – Program Consultant	-	-
Eastern Regional Health Authority	Judy O'Keefe – Vice President, Clinical Services	-	4
	Katherine Turner – Regional Director, Community Support Services	-	-
	Morley Payne – Regional Manager, Financial and Administration Services	-	-
	Leonard Mercer	-	-
	Joanne Halfyard	-	-
	Carol Byrne – Regional Manager, Cooperative Apts	-	-
	Lilly Mulrooney	-	-
Central Regional Health Authority	Joni Wells – Manager	-	-
	Florence Sentner – Manager	-	-
	Keith Parsons – Regional Director, Community Support Services	-	-
	Barry Boland – Director of Community Programs, Financial Management	-	-
Western Regional Health Authority	Chris Squire – Director, Finance	4	-
	Jackie Hicks	-	-
	Tammy Priddle – Regional Director, Community Support	-	-
Labrador-Grenfell Health Authority	Blenda Dredge – Director	4	-
	Debbie Pelley – Manager, Client Services	-	-
Memorial University	Gail Wideman – Associate Professor, School of Social Work	-	4
Association for Community Living	Pam Anstey – Executive Director	-	4
Department of Seniors & Social Development	Henry Kieley – Director of Adult Protection (Acting)	-	4
Home Care Agency Association	Elizabeth Jenkins – President	-	4
Seniors NL	Kelly Heitz – Executive Director	-	4
CareGivers / Seafair Capital	Anne Whelan – President & Chief Executive Officer	-	-
	Brent Meade – Vice President, Care Partnerships	-	-
	Matthew Head – Operations Manager	-	-
Provincial Health & Home Care	Neil Tremblett – President	-	-

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