ENABLING EFFECTIVE, QUALITY POPULATION AND PATIENT-CENTRED CARE: A PROVINCIAL STRATEGY FOR HEALTH INFORMATION MANAGEMENT AND TECHNOLOGY

CROSS SECTOR POLICY DISCUSSION PAPER
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Executive Summary

Introduction

In February 2014, the Ministry of Health (the ministry) set out a refreshed strategic direction for the province’s health system in Setting Priorities for the B.C. Health System. By March 2015, the ministry published policy discussion papers for three cross-sector focus areas: primary and community care, rural health services and surgical services. These documents identified the need for an Information Management and Information Technology (IM/IT) strategic framework to support and enable the health sector’s priorities.

The purpose of this paper is to set the strategic framework and direction for health sector IM/IT and to recommend key IM/IT actions to support implementation of the provincial health care strategy.

The ministry will consult with key stakeholders on the proposed provincial IM/IT strategic framework and recommended key actions, as outlined in this paper, with a view to beginning implementation starting in the fall of 2015.

Strategic Context

The health care needs of B.C. residents can be examined in terms of major health concerns: staying healthy, getting better, living with illness or disability, and coping with end of life. IM/IT has a key role to play in enabling health care service delivery in all of these areas.

Given the potential breadth of roles that IM/IT might play, the province will focus its IM/IT efforts on enabling the strategic directions across three cross-sector focus areas, as outlined in the following three policy papers:

- Primary and Community Care in BC: A Strategic Policy Framework
- Rural Health Services in BC: A Policy Framework to Provide a System of Quality Care
- Future Directions for Surgical Services in British Columbia

Analysis of these three papers yielded the following key implications for IM/IT. These implications form the backdrop for the recommendations identified in this document.

Integrated Clinical Systems

- Connect health information systems across the continuum of care – including electronic medical record systems, clinical information systems and provincial eHealth systems – to enable the flow of up to date patient information.
- Expand the adoption and use of electronic medical record systems and services.
• Establish a common, integrated, end-to-end clinical information system, with standardized administration functions, such as referrals, scheduling, and registration.

**Single Health Record**
• Continue efforts to establish a fully interoperable electronic health record that allows clinicians to access up-to-date, longitudinal patient information at the point of care, and enables patient access to their own health information over the long-term.

**Shared Care Planning**
• Provide multidisciplinary health care team members with the ability to contribute to a patient’s health care plan and access up-to-date patient health information, at the point of care.

**Telehealth Expansion**
• Standardize and expand use of telehealth, including use of videoconferencing technologies for appointments and home health monitoring.
• Use telehealth to support regional, and where appropriate, provincial networks of specialized care delivery teams in primary and community care settings across rural and remote communities.
• Leverage telehealth technologies for recruitment, retention and professional development of clinicians.
• Expand the use of telehealth services for pre- and post-surgical assessments and consultations.
• Support telehealth policy recommendations to ensure emerging technologies are leveraged for key populations:
  1. The frail senior population living in residential care;
  2. Patients with low, medium or high complex chronic conditions;
  3. Patients with severe mental illness and/or substance use issues; and,
  4. Patients living in rural and remote communities.

**Surgical Booking and Waitlist Management**
• Proceed with the surgical booking and waitlist management model prepared in 2015 as the solution for surgical wait list management, surgical booking, and synchronization of wait list data between stakeholders to create a single and reliable source of information for surgical services.
• Prototype electronic referrals between family physicians and surgeons.

**Improved Data and Analytics**
• Continue to strengthen quality, robustness and access to health related data in B.C. resulting in better evidence to improve policy, enhance system sustainability, and enhance the health of the population.
• Improve the quality of health data and enable advanced statistical analysis by supporting development and implementation of standardized data sets to be used across primary and community care services.
• Standardize data fields to ensure accurate and timely business intelligence, allowing for identification of service demand trends and evidence based decision-making.

**Current Health Sector IM/IT Assets and Services**
Health care in British Columbia is publicly funded and delivered by a mixture of public and private sector organizations. In general, primary care (including family physicians and specialists) and supporting community services, such as laboratory, medical imaging and pharmacy services, are provided by the private sector. Hospital and acute care, home, community, mental health and addictions, and most residential care services are provided by the public sector health authorities. In addition to care delivery services, the ministry directly manages health insurance and benefits through programs and services such as the Medical Services Plan and PharmaCare.

**The Case for Change**
IM/IT services and systems have grown within this dynamic mix of organizations and care settings, resulting in different and only partially connected IM/IT systems across the health sector. In response, the past decade has seen substantial consolidation and integration of computer systems supporting health care in B.C. with a major focus on building the foundations and common electronic services that can be leveraged in the future. However, due to the complexity and breadth of B.C.’s health care system, there is still significant work ahead.

**Current Health Sector IM/IT Challenges**
For health IM/IT to enable proposed cross-sector focus area actions, the following strategic challenges must be considered and addressed:

1. Lack of a common sector-wide vision and approach for IM/IT;
2. Distributed IM/IT governance and limited business representation and leadership;
3. Multiple funding sources and lack of long-term investment strategy;
4. Multiple, loosely connected clinical information systems and a lack of provincial clinical information standards; and,
5. Lack of a comprehensive change management strategy to support and sustain required change.

**The Next Steps: A Strategic Framework for Health IM/IT**
The strategic framework illustrated below captures how IM/IT will support the transformation of the health system. The light blue area highlights the key IM/IT implications arising from the three cross-sector focus areas. The green area features three strategic priorities for IM/IT that offer a common response to the needs of the cross-sector focus areas. The dark blue area indicates three foundational enablers of IM/IT that must be addressed in order to provide an effective IM/IT response.
Consultations will be occurring regarding the policy directions set out in the three cross-sector focus area papers (primary and community, rural and surgical) and in this provincial IM/IT enabling strategy. Results of these consultations will be used to establish IM/IT priorities and confirm near-term IM/IT commitments from amongst the various recommendations set forth in this paper. This will be reflected in an IM/IT action plan supporting the three cross-sector focus areas over the next two fiscal years (2015/16 - 2016/17). It is anticipated the implementation of this IM/IT strategy will be an ongoing and multi-year process requiring continual commitment and balancing of priorities and resources to the IM/IT action plan. As items in the IM/IT action plan are completed, both the strategy and action plan will need to be revised and refreshed to ensure relevance.

The following recommendations are based on the strategic priorities and enablers in the above strategic framework.
IM/IT Strategic Priorities

1. Health Information Exchange

A dominant IM/IT theme across the policy frameworks for primary and community, rural and surgical services is the need to share and exchange patient health information across the continuum of care. Health Information Exchange (HIE) is a term used to describe the many ways in which information is shared or moved between different parts of the health system.

The fundamental intention of HIE is to enable better decision making at the point of care and ensure a high-quality and sustainable patient-centered care system. This can be achieved by ensuring relevant up-to-date, complete and accurate patient information at the point of care.

Currently in B.C., health information does not consistently follow the patient as they move between care settings, resulting in potentially sub-optimal care, and duplicative clinical effort and cost. While some health information exchange services exist in the B.C. health system, these services are far from fully integrated.

In order to move from the current situation towards our target outcomes for HIE, the following recommendations have been put forward:

1.1 By Fall 2015, Establish Sector-Wide HIE Governance

Establish sector-wide HIE governance under the authority of Leadership Council and its standing committees, including leaders representing the business of health and other key health system partners, to oversee and guide clinical and IM/IT transformation in all areas of health information exchange. This governance authority will prioritize the standardization of clinical processes and exchanges of health information in the areas of most need, and establish and oversee an integrated clinical and IM/IT transformation roadmap, including project and change management plans for all HIE-related projects and investments.

1.2 By Winter 2016, Establish the HIE Vision, Architecture and Roadmap, Through Business and Clinical Engagement

Leadership Council’s Standing Committee on IM/IT, the health sector’s most senior cross organizational IM/IT governing body, has sponsored and initiated the HIE project. This project includes clinical engagement and will set the necessary foundation for agreement and commitment to HIE as a provincial priority. It will establish the overall framework, conceptual model and priorities for all types of health information exchange in B.C. Health (e.g., referrals, reports, care plans, advanced care directives, etc.). It will also include consideration of the role and content of a longitudinal patient health record, support for interdisciplinary care teams and shared care planning, electronic referrals (which is anticipated to be a high-priority project under the resulting HIE roadmap), and providing patients with access to their own longitudinal health record.
1.3 Establish a Roadmap for Clinical Systems Integration
Within the frame of the HIE vision and architecture, develop an overall provincial integration strategy to drive the connection of existing health information systems, including provincial, hospital and acute, diagnostic and pharmacy, and primary, community and residential care services.

1.4 Identify Foundations for Shared Care Planning
Within the frame of the HIE vision and architecture, support clinicians in developing a shared care planning vision and business architecture to establish the overall model, definitions, concepts, work processes and information standards for shared care planning – as a backdrop for determining IM/IT enablers.

1.5 Continue the Surgical Booking and Waitlist Management Solution
Proceed with the surgical booking and waitlist management model prepared in 2015 as the solution for surgical wait list management, surgical booking, and synchronization of wait list data between the various stakeholders to create a single and reliable source of information for surgical services.

1.6 Enable Electronic Prescribing
Continue current efforts towards realizing the vision of electronic prescribing, to support patient safety, patient centred-care and an efficient health care system. This project includes policies supporting the use of electronic prescriptions, standards for integrating clinical systems, and supporting the subsequent systems integration and transition of community pharmacists, physicians and hospitals.

2. Data Sharing for Decision Support
This strategic priority is motivated by the need to enhance decision support for health care research, analysis, and health system performance assessment. Setting Priorities for the B.C. Health System calls out three specific IM/IT accountabilities in this area:

- Address access, quality, standardization and timeliness of administrative and clinical care data for health system planners, policy makers, managers and researchers.
- Build informatics capacity to use data to enhance decision-making and improve outcomes at all levels of the system, while meeting privacy and security requirements.
- Review the current patchwork of legislation governing the use of health data with a view to improving its utilization while respecting patient privacy.

The sharing of health information in the B.C. health sector can be difficult, and is further complicated by a patchwork legislative framework consisting of twelve distinct acts and regulations. As a consequence of this complexity, there tends to be uneven risk tolerance towards data sharing across health sector organizations. When this is contrasted with increased expectations to use health information for research purposes, and changing expectations of citizens to have their own health information follow them through the health system, it becomes clear the current model of risk aversion as the key determinant for sharing information must be revised.
In order to move from the current situation towards fulfilling the accountabilities identified above, the following recommendations have been put forward:

2.1 By Fall 2016, Establish Health Information Management Policy Framework
Proceed with development of a health information management policy framework, ensuring patient data is adequately protected while also being used to improve health outcomes and reduce costs. This will establish a single framework for health information management in B.C., covering both public and private domains, and addressing consent, collection, use and disclosure of health information. The intent is to better enable access by decision makers to the information needed to influence and inform decisions that have an impact on the health sector.

2.2 By Fall 2016, Establish Data Sharing Accountability Framework
Articulate an accountability framework for data sharing that identifies roles and accountabilities of each and every partner in the health sector. Ideally this should be undertaken within the context of the new health information management policy framework.

3. Patient-Centred Information and Technology

Patient-centred care has become a driving priority for the health sector. Patient-centered care is defined as embedding shared values around creating the experience of individualization through recognition, respect, empathy, compassion and dignity underscored by comprehensive and understandable information provided to patients and their families through excellent communication, transparency, and partnership.

Moving to a patient-centred care model is a long-term goal that requires a shift in health care culture, implementation of new technologies and services, and potentially changes to existing legislation. The change is driven by a number of factors including growing patient and citizen expectations for greater access to their health information and online health services, and the health systems needed for citizens to be more actively engaged in managing their health.

Advancements in technology have already allowed the health system to begin to move towards a more patient-centered model of care. One such example is the expanded use of telehealth services across the province, which allows physicians to communicate with patients remotely, when geographic or other restrictions make face-to-face interactions impractical. Two telehealth projects currently underway include the First Nations telehealth expansion project and a home health monitoring project. The First Nations telehealth expansion project will extend health care delivery services via telehealth to 45 rural and remote communities. The home health monitoring project enables patients to monitor their conditions at home through remote monitoring technology, while staying connected to their care providers.
Another patient-centered technology being rolled out by the province is the new BC Services Card, which replaces the existing CareCard. It provides an identity credential that will act as the key to unlock citizen health solutions online. The new card will assist with confirming identity and MSP eligibility at all points of care, reduce fraud, increase accuracy of health record information and will eventually enable citizen’s secure online access to their health information (e.g., prescription drug information, status of claims and immunization histories).

As the province continues these efforts, the following recommendations have been put forward:

3.1 Develop a Patient-Centered Information and Technology Strategy
Establish the vision, intent and scope for patient-centred services within the health sector, as needed to support BC’s patient-centred care model. This strategy includes approaches for ensuring secure online exchange of health information with patients, whether through a secure portal or access to a personal health record. This strategy will also contemplate how patients will use technology to access the health system in a more patient centred format, for example, by booking appointments online, tracking their spot on waitlists or using email and text to communicate with care providers.

3.2 Finalize and Implement the Provincial Telehealth Strategy
Establish the vision, intent and scope for telehealth services. This will ensure a consistent approach, use of compatible technologies, and availability of services across the health sector. The strategy will identify the necessary infrastructure, architecture, standardization, and key policy decisions necessary to meet the needs of priority and target populations identified in Setting Priorities for the B.C. Health System. Linkages will also be needed to the development of practice guidelines for the use of telehealth services.

This recommendation is also an umbrella for other related telehealth efforts, including:

- **Telehealth Infrastructure Inventory** – Determine requirements and options to support Telehealth across the continuum of care (currently underway);
- **Telehealth Oversight and Operations** – Establish provincial telehealth governance and accountability, clinical leadership and an operational support model;
- **Telehealth Expansion** – Enable telehealth into primary and community settings using existing network infrastructure and services. Telehealth expansion will also consider how private vendor telehealth services could be leveraged while ensuring:
  - privacy and security of patient information;
  - longitudinal, attached patient care;
  - clinical information from a telehealth consultation is included in the electronic health record; and,
  - sustainability of the health care system.
3.3 Expand Home Health Monitoring Services
Home health monitoring (HHM) is a suite of services targeted at educating and monitoring patients with chronic conditions in the home. Island, Interior and Fraser health authorities are the first to pilot the use and integration of HHM services. Results of these efforts will be used to expand HHM services for key patient populations across the province.

IM/IT Strategic Enablers

4. Health Information Standardization
This strategic enabler is directed towards enhancing health care quality and patient safety through standardization of health information. Standardization is a requirement for realization of HIE expectations – HIE addresses procedural and technical standardization (i.e., processes and systems for information exchange), while health information standardization addresses the content of information exchanges.

Current sector-level capabilities towards health information standardization are limited and must be strengthened as part of advancing the IM/IT strategic agenda. This includes sector-level capabilities to develop, agree upon, implement and enforce common health information standards. Within this frame, specific standards for priority information exchanges are required, from basic administrative information through to clinical information. Specific recommendations include:

4.1 Establish Provincial Information Standards Governance
Establish a centre of accountability to drive development, promotion and conformance to sector-wide BC information management standards.

4.2 Establish Provincial Information Standards Service Responsibilities
Establish responsibilities for developing and overseeing the adoption and implementation of provincial-level health information standards. This includes acting as the “arms and legs” for the provincial information standards governance referenced above, with responsibilities for leading or coordinating standards development in partnership with health authority and private physician stakeholders.

4.3 Drive Foundational Provincial Information Standards
Drive standards development and adoption in foundational areas, including client identity, use of the personal health number, provider identity, location identifiers, and commonly used clinical references like problem lists and allergies, and using standard health information vocabularies.

4.4 Establish Project Gating for Standards Compliance
Gate the initiation of projects and stipulate that all procurement activities conducted within the health sector reflect established provincial information management requirements, with a view to driving the adoption of provincial information standards.
5. IM/IT Governance and Investment

Transforming B.C.’s health IM/IT system is about more than new technology or information systems; it requires a shift in how organizations across the province work together. Health organizations must work collaboratively towards a shared vision for IM/IT and ensure investment and effort are co-ordinated and maximized to the benefit of all BC residents.

The current approach to IM/IT governance and investment across publicly-funded B.C. health organizations is largely organizationally-centric with some efforts towards common investments for shared needs. Independent organizational efforts to enable business and clinical transformation through IM/IT are no longer appropriate or sustainable. If we are to advance the health system strategy, IM/IT must shift to addressing common or shared interests collectively.

In order to advance in this area, the following are recommended:

5.1 Health Authorities to Commit to Provincial IM/IT Accountabilities
Increase provincial accountabilities and expectations of health authority executive and leadership roles (across IM/IT, finance, planning and clinicians), with a view to incenting them to advance common and shared interests (specifically HIE) from a provincial rather than regional perspective.

5.2 Make Explicit IM/IT Funding Expectations and Linkages
Make better use of existing authority mechanisms to advance the strategic IM/IT agenda expressed in this document, with a view to ensuring IM/IT funding is directed towards the provincial agenda.

5.3 Develop a Common and Shared Interest Policy and Associated Funding and Resourcing Framework
Establish a framework and process for IM/IT funding and resourcing of efforts where those efforts are of “common or shared interest”, with the intent to align and collaborate on IM/IT strategic priorities and expenditures. This could initially be focused towards HIE interests as a way of piloting the concept, and then could be expanded beyond HIE to include all IM/IT projects of common or shared interest.

5.4 Integrate IM/IT Planning Cycles Across the Health Sector
Synchronize ministry and health authority planning cycles and deliverables to drive consistency of purpose and direction into IM/IT efforts across the sector.

5.5 Develop an IM/IT Capital Planning and Expenditure Review Process
Develop an IM/IT capital review process for publicly-funded health sector investments, regardless of the funding source. The underlying intent of this process is towards more effective alignment of funding to the provincial, strategic IM/IT agenda, through monitoring and control of potential investments.
5.6 Develop Change Management Strategy for Key Policy Changes

Resource, develop and implement a comprehensive change management strategy to support successful implementation of the provincial IM/IT strategic plan and recommended key actions in this paper. The change management strategy will focus on: creating awareness of the provincial agenda and need for change; building desire and commitment to the change; knowledge of what exactly will be changing when; ability to support the change; and, reinforcement of the change.

6. Shared IM/IT Services

Within the context of IM/IT in the B.C. health sector, this strategic priority further advances the IM/IT service centre concept, which was established by government to provide shared delivery and optimization of business and technology services common to all health authorities. This IM/IT service centre concept has been implemented as one of the lines of business within the mandate of Health Shared Services BC (HSSBC). The purpose of all of HSSBC’s lines of business is to improve administrative cost effectiveness and enhance service quality for all health authorities.

Progress toward the shared IM/IT services model has been made with the shared use of data centres and with transition to a provincial desktop management service. However, shared IM/IT services are still not evenly deployed across health authorities and introduction of new services has been challenging.

In order to facilitate continued realization of the benefits of shared IM/IT services, the following action is recommended:

6.1 Formalize Organizational Roles, Mandates and Establish a Plan of Action to Transition to Shared IM/IT Services Model

Establish a clear, shared IM/IT business and technology services vision, model and mandate, including organizational roles and any other functional responsibilities that may be required as sector-level services come to fruition, including integration and conformance services. Confirm the scope of services to be delivered through a shared services model. Back this with a transformation plan to expedite the transition to the shared IM/IT services model.
Introduction

In February 2014, the Ministry of Health (the ministry) set out a refreshed strategic direction for the province’s health system in *Setting Priorities for the BC Health System*. By March 2015, the ministry published policy discussion papers for three cross-sector focus areas: primary and community care, rural health services and surgical services. These documents identified the need for an Information Management and Information Technology (IM/IT) strategic framework to support and enable the health sector’s priorities.

The purpose of this paper is to set the strategic framework and direction for health sector IM/IT and to recommend key IM/IT actions to support implementation of the provincial health care strategy.

The first half of the paper provides an overview of the business of health care and the potential role that IM/IT might play in enabling and supporting strategic change of the health system. It includes an overview of the purpose of the health system – population and patient health – and a brief overview of the emerging population and patient needs of British Columbians.

The paper links the emerging population and patient needs to three cross-sector focus areas: primary and community services, rural services, and surgical services. A high-level synopsis is provided of the policy directions, key principles and IM/IT implications arising from each of the three associated cross-sector focus areas policy papers:

- *Primary and Community Care in BC: A Strategic Policy Framework*
- *Rural Health Services in BC: A Policy Framework to Provide a System of Quality Care*
- *Future Directions for Surgical Services in British Columbia*

The paper then provides an overview of the landscape of health sector IM/IT and highlights some of the significant challenges of addressing the implications of these cross-sector papers.

The second half of this paper outlines the strategic framework for IM/IT. It includes an overview of the strategic IM/IT priorities recommended for best supporting the three cross-sector focus areas. It also includes a discussion of foundational IM/IT enablers that are needed to bring health sector IM/IT services to a level of maturity that most effectively supports the strategic IM/IT priorities.

The ministry will consult with key stakeholders on the proposed provincial IM/IT strategic framework and recommended key actions, as outlined in this paper, with a view to beginning implementation starting in the fall of 2015.
Strategic Context

What is the province’s health status and how is it projected to change over the coming 10 to 15 years?

To understand the population’s health care needs, the ministry groups B.C. residents according to their major health concern in a given year. The population is first divided into the four dimensions: Staying Healthy, Getting Better, Living with Illness or Disability, and Coping with End of Life. These dimensions are further divided into smaller segments, as reflected in Figures 2 and 3 below.

The ministry tracks health service utilization by population segment in a number of areas, as highlighted in the tables below. The services identified contribute to approximately two-thirds of all yearly health expenditures, providing a good representation of provincial health service usage. This information is then used for analysis and decision making, particularly to project future health service needs.

Figure 2 identifies the health services cost of the average person in each of the population categorizations, while Figure 3 represents the total cost of that population category.

Figure 2: Health System Matrix ($ PER PERSON)
These tables help to illustrate what the population and patient health needs of the province are and allow us to identify emerging trends in service utilization. It is important to note that the three population segments that stand out as using a significant percentage of health services and health care dollars include:

1. The frail senior population living in residential care;
2. Patients with low, medium or high complex chronic conditions; and
3. Patients with severe mental illness and/or substance use issues.

Successfully meeting the needs of these and other patient populations is therefore a critical component of any strategy moving forward. ¹ Below is a brief overview of the four main patient categorizations within British Columbia.

**Staying Healthy**

This dimension accounts for 16 per cent of the provincial population, who account for nine per cent of expenditures for minor episodic health needs and maternity care services. The optimal outcome for the health system is to ensure that as many British Columbians as possible reside in this group, free from major health crises. The majority of patients in this category will have minor episodic health concerns and live relatively healthy lives. The key focus for health service delivery to this group is to provide timely access to quality, minor episodic care in the community and to avoid unnecessarily using

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¹ This section provides a high level summary of population and patient health care needs. More detailed data and analysis can be found in each of the three cross-sector focus area papers.
emergency departments and other hospital services for non-urgent care. A second important service delivery area in this grouping is maternity care, which is currently largely provided in hospitals in British Columbia.

**Getting Better**
This dimension accounts for only three per cent of the population and uses six per cent of services. The majority of patients in this category have major or significant, yet time-limited, health needs. The focus for health service delivery in this group is to provide timely access to quality, major or significant time-limited care that includes access to diagnostics, medical and surgical services as required. A key area of growth is the demand for elective surgery.

**Living with Illness or Disability**
This dimension accounts for over 40 per cent of the population and almost 50 per cent of all health system expenditures accounted for in the matrix ($5.2 billion). From a health service delivery perspective, the focus for this group is three-fold: to help manage their health conditions as best as possible over time; to help prevent their condition from becoming more severe or complicated by additional health issues; and, if possible, to return them to full health. This group requires significant, sustained, and co-ordinated effort on the part of health service providers to achieve the best possible health outcomes.

**Coping with End of Life**
The population in this category are dealing with health challenges that will likely not diminish. Some are in the final stages of life while others have significant and often age-related health concerns that either require residential care or substantial community based health care and support. While accounting for less than two percent of the provincial population, this group uses 35 per cent of all services accounted for in the table ($3.7 billion). Here, the focus is on aiding in the management of conditions in a way that produces the best possible health outcomes and quality of life delivered in a cost-effective manner.

IM/IT has a key role to play in enabling health care service delivery in all of these areas. Given the potential breadth of roles that IM/IT might play, the province will focus its IM/IT efforts on enabling the strategic directions across the three cross-sector focus areas described in the following section.

**What are the health cross-sector focus areas?**
Understanding the province’s health status and how it is projected to change over the next 10 -15 years helps inform where significant change is required in health care service delivery. Rethinking how the province delivers care to populations consuming the majority of the health care dollars is instrumental in the strategy moving forward. A synopsis of the three cross-sector focus areas and how best to serve these key populations is outlined in the rest of this section, along with any key principles and implications for establishing a provincial IM/IT strategy.
Primary and Community Care in BC: A Strategic Policy Framework

Synopsis
Primary health care – as the foundation of Canada’s health care system – provides a critical entry point to the health care system and serves as the vehicle for ensuring continuity of care across the system. Complementary to this, home and community care provides services designed to help people receive care at home, rather than in a hospital or long-term care facility, allowing patients to live as independently as possible in the community.

Primary and community care services in B.C. are delivered by a variety of health professionals in a number of different settings. These include: general practitioner offices and health authority run primary care locations in the community; private providers; as well as aspects of hospital care and residential care.

The Primary and Community Care in BC paper emphasizes the need to drive decision making and care restructuring based on the following principles:

1. **Patient-Centred**: Recognizing the need for health care to consider the whole person and not simply the presenting health issue, primary and community health services will be centered on the health needs of individuals, their families and communities.

2. **Integrated and Comprehensive**: Ensuring integrated and comprehensive patient-centred health care including health promotion and disease prevention drives all policy and system redesign. Primary and community services will be integrated around the patients and clients.

3. **Quality and Value for Money**: Primary and community care will be built on the domains of quality (i.e., effectiveness, acceptability, appropriateness, accessibility and safety), a desire to provide care outside of facility-based settings, achieving value for money and budget sustainability.

4. **Responsible Operational and Capital Investment**: Existing expenditures will be protected, appropriate reallocations from the acute to the community services sector must become part of go forward health authority planning and going forward a majority of net new funding must be assigned to developing primary and community services.

The key themes of the primary and community care paper are to improve health service delivery by:

- Reducing complexity of the current service delivery system,
- Wrapping services around the patient,
- Enabling multidisciplinary teams,
- Allowing for specialist medical input, and redesigned consulting services,
- Providing alternatives to hospital stays,
- Aligning the priorities and resources of partnered organizations,
- Building an infrastructure to support the model, and
- Harnessing the power of the wider community.
Implications for a Health IM/IT Strategy

Primary and Community Care in BC identified the following actions that require the support of a provincial IM/IT strategy:

Shared Care Planning
- Provide multidisciplinary health care team members with access to up-to-date patient health information, at the point of care.
- Enable multidisciplinary health care teams to contribute to the patients’ health care plan.

Improved Data and Analytics
- Improve the quality of health data and enable advanced statistical analysis by supporting development and implementation of standardized data sets to be used across primary and community care services.
- Standardize data fields to ensure accurate and timely business intelligence, allowing for identification of service demand trends and evidence based decision-making.

Telehealth Expansion
- Standardize and expand use of telehealth, including use of videoconferencing technologies for appointments and home health monitoring.
- Support telehealth policy recommendations to ensure emerging technologies are leveraged for key populations:
  1. The frail senior population living in residential care;
  2. Patients with low, medium or high complex chronic conditions; and
  3. Patients with severe mental illness and/or substance use issues.

Rural Health Services in BC: A Policy Framework to Provide a System of Quality Care

Synopsis
The focus of the Rural Health Services in BC paper is on the wide variety of challenges and strategies to improve access to health care in rural and remote communities. While there are many benefits to rural life, living in rural BC clearly presents some unique challenges to providing appropriate access to health care. These challenges stem from multiple factors: geographic remoteness, long distances, low population densities, less availability of other providers and severe weather conditions. The challenge is how best to meet the range of health service needs for rural and remote communities.
The rural health services policy paper is a planning and action framework that will be used to enable a consistent approach to addressing health service priorities through a rural lens. It emphasizes the need to improve access to health care in rural and remote communities using the following principles:

1. Understanding population and patient health;
2. Developing quality and sustainable care models;
3. Recruiting and retaining engaged, skilled health care providers; and,
4. Supported by enabling IM/IT tools and processes.

These principles must work together to allow innovation and flexibility in responding to the diversity of geographies that exist across the province.

**Implications for a Health IM/IT Strategy**

The *Rural Health Services in BC* paper identified the following actions that require the support of a provincial IM/IT strategy:

**Integrated Clinical Systems**
- Connect health information systems across the continuum of care – including electronic medical record systems, clinical information systems and provincial eHealth systems – to enable the flow of up to date patient information.
- Expand the adoption and use of electronic medical record systems and services.
- Establish a common, integrated, end-to-end clinical information system, with standardized administration functions, such as referrals, scheduling, and registration.

**Single Health Record**
- Continue efforts to establish a fully interoperable electronic health record that allows clinicians to access up-to-date, longitudinal patient information at the point of care, and enables patient access to their own health information over the long-term.

**Telehealth Expansion**
- Use telehealth to support regional, and where appropriate, provincial networks of specialized care delivery teams in primary and community care settings across rural and remote communities.
- Standardize and expand use of telehealth, including use of videoconferencing technologies for appointments and home health monitoring, to improve patient centred care delivery to those living in rural and remote communities.
- Leverage telehealth technologies for recruitment, retention and professional development of clinicians.
Future Directions for Surgical Services in British Columbia

Synopsis
A patient-centred and cross health system approach is required to achieve significant improvement in timely access to appropriate surgical treatments and procedures to realize the vision of high quality, patient centered surgical care within a sustainable health system for the residents of British Columbia.

Future Directions for Surgical Services in B.C. emphasizes the need to improve timely access to appropriate surgical treatments and procedures built on the following principles:

1. Providing patient-centered care;
2. Understanding population and patient surgical health care needs;
3. Developing quality and sustainable surgical care delivery models;
4. Recruiting and retaining engaged, skilled health care providers;
5. Using IT/IM tools and processes as supports to allow innovation and effective co-ordination and delivery of surgical services;
6. Using financial models to support the achievement of intended health system outcomes; and
7. Using all of these elements across the province for the complete continuum of care.

Implications for a Health IM/IT Strategy
The surgical services paper identified the following actions that require the support of a provincial IM/IT strategy:

Single Health Record
- Continue efforts to establish a fully interoperable electronic health record that allows clinicians to access up-to-date, longitudinal patient information at the point of care, and enables patient access to their own health information over the long-term.

Improved Data and Analytics
- Continue to strengthen quality, robustness, and access of health related data in B.C. resulting in better evidence to improve policy, enhance system sustainability, and enhance the health of the population.
- Increase access to health data for secondary purposes to inform policy decision making, improving health outcomes for the health sector as a whole.

Surgical Booking and Waitlist Management
- Proceed with the surgical booking and waitlist management model prepared in 2015 as the solution for surgical wait list management, surgical booking, and synchronization of wait list data between stakeholders to create a single and reliable source of information for surgical services.
- Prototype electronic referrals between family physicians and surgeons.

Telehealth Expansion
- Expand the use of telehealth services for pre- and post-surgical assessments and consultations.
Current Health Sector IM/IT Assets and Services

Health care in B.C. is publicly funded and delivered by a mixture of public and private sector organizations. In general, primary care (including family physicians and specialists) and supporting community services, such as laboratory, medical imaging and pharmacy services, are provided by the private sector. Hospital and acute care, home, community, mental health and addictions, and most residential care services are provided by the public sector health authorities. In addition to care delivery services, the ministry directly manages health insurance and benefits through programs and services such as the Medical Services Plan (MSP) and PharmaCare.

IM/IT services and systems have grown within this dynamic mix of organizations and care settings, resulting in differing and only partially connected IM/IT systems across the health sector. In response, the past decade has seen substantial consolidation and integration of computer systems supporting health care in B.C. with a major focus on building the foundations and common electronic services that can be leveraged in the future.

In particular, there has been significant effort and investment toward establishing electronic health record (HER) systems. A patient EHR is a longitudinal view of an individual’s significant health information over their lifetime. EHR systems enable patient health information to be securely stored and shared electronically. Today, in B.C., an individual’s EHR is spread across a number of systems and data stores. Consolidation of laboratory test results and prescriptions filled is complete and now available to providers provincewide. Electronic prescribing is ready to be deployed provincially. Work continues on integrating additional key health information. B.C.’s EHR solution will eventually provide consolidated and consistent access to medical imaging studies, immunizations, care summaries, referrals, problem lists, allergies, end of life instructions and more.

The remainder of this section provides an overview of some of the key IM/IT assets and services at each of the principal levels of the health system: provincial services, hospital and acute care services, diagnostic and pharmacy services, and primary, community and residential care services.

Provincial Services

Provincial information systems support integration of health information and services across health care organizations in the province with the objective of improving clinical access to information for decision making purposes, minimizing cost, redundancy and improving standardization. Provincial services also support use of aggregated health information for health system management purposes: provincial health policy development, population health analysis and health research.
Provincial Lab Information Solution

The Provincial Lab Information Solution (PLIS) is a consolidated repository of laboratory test results and reports for individuals. As of March, 2015, more than 90 million reports are held in the repository, including over 98 per cent of B.C. public and private laboratory tests.

Clinician access to patient lab results and reports is supported in one of two ways:

- **Direct access to PLIS** from within the clinician’s own information system. Work is currently underway to continue integrating major regional health systems and physician EMR’s to PLIS.
- **Secure PLIS viewer access** for authorized clinicians to view PLIS information online. The web browser viewer enables authorized users to conveniently access lab test results and reports outside of normal health information systems, thereby broadening provider access to test result information.

Client Identity Services

The Client Registry is a repository of personal information on all recipients of B.C. health care services. It contains information such as the personal health number, patient identifiers, personal demographics and contact information. Underlying the Client Registry is an Enterprise Master Patient Index, which links together a patient’s identifiers, and enables integration of clinical information systems to the provincial client identity service – ensuring instant confirmation of client identity. The client registry also enables electronic health record functionality by uniquely identifying a patient no matter where or when they interact with the B.C. health system. This unique identification service provided by the Client Registry enables provincial clinical systems to accurately associate an individual’s health records and present a complete clinical view to care providers.

Provider Identity Services

The Provider Registry is a provincial repository of health care provider information. Information about providers is supplied by various colleges and associations, including identifiers, personal demographics, contact information, licensing status and expertise. The information is made available to authorized consumers within the health sector. Connecting to the Provider Registry improves data quality and decision making by providing the consumer with up to date provider information and licensing status. This eliminates the need for multiple information feeds from the various colleges directly to consumer databases.

PharmaNet

PharmaNet is a provincial system used primarily by community pharmacists to support the dispensing of medication and related insurance processes. In 2014, PharmaNet was used to process over 68 million claims and support clinical decision-making in over 1,200 community pharmacies, by 2,000 community physicians, and in many hospitals and emergency departments across the province. Electronic prescribing has been enabled within PharmaNet and plans are underway to deploy the service to all community pharmacies in British Columbia. This will include integration of regional
clinical information systems, community electronic medical record systems and pharmacy systems with PharmaNet’s electronic prescribing services.

Panorama
Panorama is a public health application supporting surveillance, communicable disease, outbreak, case, vaccine, family health and immunization management services. It improves the ability of public health officials to detect outbreaks and collect, share and analyze information in real-time, which is critical for managing communicable diseases and efficiently managing outbreaks. Panorama supports customized infant screening, assessment, and care plans. It has a centralized vaccine inventory program which reduces waste by monitoring and re-deploying vaccines before they expire. This provides improved inventory information that has better prepared B.C. to respond to any potential future outbreaks. Activities are underway to complete the provincial immunization repository through integration with physician electronic medical records and other point-of-service clinical applications, and to integrate Panorama with the provincial electronic health record, enabling laboratory test ordering and electronic delivery of reportable communicable disease laboratory test results. B.C. is the first jurisdiction to implement the full suite of Panorama functionality supporting the national objective of sharing public health information with other jurisdictions across Canada and allowing patient access to immunization data. B.C.’s efforts have also laid the foundation for achievement of our future-facing public health strategic priorities.

Provincial Telehealth Services
Telehealth is an overarching term used to describe information and communication technologies, such as videoconferencing, to connect health care providers, patients and educators over distance, to enable: clinical consultation; health care management; general health promotion; and, continuing professional education.

The capacity for two-way, live videoconferencing for clinical, administrative and health related educational encounters exists in more than 130 communities throughout British Columbia. Today, there are approximately 260 telehealth facilities, providing access to approximately 1100 videoconferencing end points.²

Health authorities have successfully provided telehealth for over 10 years. Health authority delivered telehealth services started from the principles of: enabling long-term care by specialists and allied health professionals; and, being clinician driven (the patient has been assessed before a telehealth appointment) to avoid mental health, language or health literacy issues that would put the patient at risk; and, fulfills privacy and security requirements.

² B.C. health authorities self reported to Ministry of Health: 2015. BC Telehealth Videoconference Inventory.
There are currently over 70 different services available using telehealth technologies. In addition, the ministry is currently engaged with the First Nations Health Authority and Canada Health Infoway to expand telehealth services to remote First Nations communities.

Recently, there has been growth in internet-based telemedicine options for physicians to provide Medical Services Plan insured telemedicine services from anywhere, to patients located anywhere in the province. Billing codes used by general practitioners for telemedicine services saw increases of 42 per cent, 180 per cent and 617 per cent in year over year growth between 2011 and 2013.

The emergence of these new, privately delivered internet based telemedicine options and the popularity of this service offering, demonstrated by the increase in billing, suggests the current telehealth services and infrastructure may not be meeting demand. Further examination of this issue is underway and findings will need to be considered as telehealth is expanded.

**Home Health Monitoring**

While there are a variety of terms and definitions used in the telehealth space, home health monitoring (HHM), tele-homecare and remote monitoring are typically used to refer to services that give clinicians the ability to monitor and measure patient health data and information remotely. HHM is especially useful for patients with chronic conditions who would otherwise require daily travel to a clinician’s office for routine measurement. This monitoring can now be done from the patient’s residence using standardized monitoring devices. The education and health benefits resulting from patient participation in remote monitoring also supports improvements in ongoing self-care. Widespread access to home health monitoring services will be expanding in B.C. over the next five years, supported by the establishment of a provincial HHM program.

**BC Services Card**

On Feb. 10, 2013, the ministry, in partnership with the Insurance Corporation of BC and the Ministry of Technology, Innovation and Citizens’ Services, launched the BC Services Card to replace the CareCard. The BC Services Card supports government’s vision of enabling citizens to safely and securely access multiple government services, both in person and on-line, through the creation of a security-enhanced photo identification card. The new card is a more secure identity credential for the health sector than the current CareCard and will greatly enhance assurance of the patient’s identity. Use of the new card in the B.C. health system and the resulting assurance of patient identity will help to reduce fraud and identity theft, enable validation of eligibility for MSP coverage, reduce card sharing, enhance patient safety, and enable secure future online access to government programs and information. As of March 1, 2015, over two million new BC Services Cards have been issued. Plans are to completely retire the current CareCard as a valid identity document in 2018.
**Hospital and Acute Services**

Hospitals and acute care providers use clinical systems to support service delivery at the point of care by providing reliable and up to date patient health information to inform decisions.

**Clinical Information Systems**

Clinical Information Systems are large scale, comprehensive and integrated IM/IT services supporting clinical activities. They can be used to support acute, community and primary care, and have been successfully implemented with varying degrees of functionality in all health authorities using one of two provincially approved solutions: Cerner and Meditech. These systems are essential tools to delivering high quality care. They enable standardization of clinical work flows, which better supports the adoption of clinical best practices, resulting in improved patient safety and care.

**Medical Imaging**

Medical imaging services are provided by both public and private sector organization in British Columbia. Work is presently underway to interconnect health authority acute care medical imaging systems, providing health authority radiologists with access to historical images and reports from across the province. Future activities will fully integrate community (private sector) imaging clinics and physician electronic medical records, enabling general access to imaging studies by authorized health care providers.

**Diagnostic and Pharmacy Services**

Diagnostic laboratories, pathology clinics, and pharmacies are unique because patients can be referred to them from a variety of sources, from private physician clinics to hospitals to long term care facilities. As these facilities are generally operated privately, a large variety of health IM/IT system are used across the province.

**Primary, Community and Residential Care Services**

Clinical systems in primary, community and residential care have undergone a significant transformation in recent years as paper charts have largely been phased out in favor of electronic records. This transformation was partially facilitated with the establishment of the Physician Information Technology Office (PITO) in 2006 which provided over one hundred million dollars over six years to private practices in support of electronic medical record system adoption by community-based general practitioners and specialists. For residential care facilities – including extended care facilities and mental health and addiction clinics – a variety of systems are still in use. This variety is due to the fact that a large portion of residential care services are provided by independent contracted service providers.
**Electronic Medical Record Systems**

Fully-utilized electronic medical record (EMR) systems replace paper-based medical records in physician practices. Over 5,035 physicians have implemented EMRs in B.C., using primarily one of eight EMR vendor solutions.\(^1\) Since the initial adoption of EMR systems, there has been an increasing use of the full features and potential of these EMRs, starting with basic capabilities for managing basic patient information and scheduling and now moving into care planning, electronic prescribing, and electronic referral of patients to specialists. EMR systems are also increasingly capable of exchanging clinical information with other systems (e.g., lab results, patient admissions and discharges), resulting in better flow of information across the continuum of care. This connection of EMRs with core provincial and regional clinical information systems will continue to advance, unlocking abilities to:

- Search for and register patients, through integration with the provincial Client Registry;
- Search for providers, through integration with the provincial Provider Registry;
- Electronically prescribe medication and access and download patient medication histories through integration with PharmaNet; and,
- Review historical lab results through integration with the Provincial Lab Information Solution repository.

\(^1\) PITO (2014)
The Case for Change: Current Health Sector IM/IT Challenges

Over the past decade, B.C. has built a foundation of IM/IT systems and infrastructure that can and must be leveraged to enable the desired strategic transformation of the health care system. However, due to the complexity and breadth of B.C.’s health care system, there is still significant work ahead. In order to advance B.C.’s strategic transformation agenda, the following IM/IT challenges must be considered and addressed:

1. **Lack of a common sector-wide vision and approach for IM/IT.**
   The role of IM/IT within the health system is to support efficient health care service delivery. The IM/IT actions identified in this paper require a different approach to IM/IT, a common, provincial approach. While today’s model of health care service delivery is regionally oriented, cross-sector action is now needed. IM/IT strategies and information systems must shift from their current regional orientation towards a common provincial vision and approach, including an effective health sector IM/IT organizational structure with clear mandates, roles and accountabilities.

2. **Distributed IM/IT governance and limited business representation and leadership.**
   B.C.’s health care system is comprised of a multitude of independent organizations, each with their own mandates and budgets. This organizational structure results in dozens of governing bodies directing and funding IM/IT projects across the health sector, leading to duplication of effort, resourcing, and conflicting IM/IT priorities. IM/IT governance is also challenged by limited representation from health sector leadership.

3. **Multiple funding sources and lack of long-term investment strategy.**
   The multiplicity of funding sources for IM/IT projects challenges the execution of an integrated, provincial plan. Funding for IM/IT projects comes from multiple sources and is secured through a variety of processes. A more co-ordinated approach to IM/IT funding, with a focus on provincial priorities, would facilitate project planning and the effective implementation of a provincial plan. In addition, major IM/IT solutions are typically multi-year endeavors that can require a funding commitment over a period of years and an ongoing stream of funding for operations. The annual budget approval cycle can present challenges to the effective management of these large multi-year projects.
4. **Multiple, loosely connected clinical information systems and a lack of provincial clinical information standards.**

The complex nature of health care service delivery and the independent nature of health sector organizations are reflected in the multitude of clinical information systems across the health sector today. While some clinical information standards, conventions and policies do exist, they are not applied inconsistently nor are they provincially accepted. This inconsistent landscape inhibits the interoperability of health information. Without clinical information standards and standardized business processes, investments in clinical information systems and interoperability of health information will not be realized.

5. **Lack of a comprehensive change management strategy to support and sustain required change.**

IM/IT is a key enabler of the cross-sector focus area actions. For IM/IT to play its part, a comprehensive change management strategy is needed to support both business transformation and the adoption of enabling IM/IT systems and services.

These challenges must be addressed for IM/IT to support and enable the provincial cross-sector focus areas. The next section of this paper presents the strategic framework for provincial IM/IT, along with a number of recommended key actions to address these challenges.
The Next Steps: A Strategic Framework for Health IM/IT

Overview of the Strategic Framework
The previous chapter described why the health system will be changing over the next 10 to 15 years, what the cross-sector focus areas are for supporting these changes, and the role IM/IT must play. It also outlined the current state of IM/IT at a general level, indicating possible challenges that IM/IT might face as it plays its part in the larger transformation of the health system.

This chapter now turns to how IM/IT efforts will be organized to best support the transformation. This includes both directly supporting each of the three cross-sector focus areas and transformation of IM/IT itself. The strategic framework illustrated below captures how IM/IT will support the transformation of the health system.

Figure 4 – Strategic Framework for Health IM/IT
Layer 1: Aligning to Our Policy Directions (light blue)
The top layer identifies the three cross-sector focus areas and the key opportunities for applying IM/IT in each of these areas. The cross-sector focus areas collectively establish the health system’s strategic policy direction and landscape. The key IM/IT opportunities are reflected in the diagram within their respective focus areas.

Layer 2: Prioritizing Our Efforts and Investments (green)
Looking across all three cross-sector focus area, there are several common IM/IT opportunities. Given that IM/IT acts as an enabler for all of the policy directions, these common opportunities form the basis for three cross-cutting provincial IM/IT strategic priorities: Health Information Exchange; Data Sharing for Decision Support; and, Patient-Centred Information and Technology. Action in these three IM/IT strategic priorities will directly contribute to attainment of the overarching strategic policy directions.

Layer 3: Enabling and Organizing for Success (dark blue)
While the IM/IT strategic priorities are the most pressing from a direct health care perspective, there are also several foundational changes that must be addressed in order to fully and effectively deliver each of the IM/IT priorities. Three further foundational enablers have been identified: Health Information Standardization; IM/IT Governance and Investment; and Shared IM/IT Services.

Consultations will be occurring regarding the policy directions set out in the three cross-sector focus area papers (primary and community, rural and surgical) and in this provincial IM/IT enabling strategy. Results of these consultations will be used to establish IM/IT priorities and confirm near-term IM/IT commitments from amongst the various recommendations set forth in this paper. This will be reflected in an IM/IT action plan supporting the three cross-sector focus areas over the next two fiscal years (2015/16 - 2016/17). It is anticipated the implementation of this IM/IT strategy will be an ongoing and multi-year process requiring continual commitment and balancing of priorities and resources to the IM/IT action plan. As items in the IM/IT action plan are completed, both the strategy and action plan will need to be revised and refreshed to ensure relevance.

The following recommendations are based on the strategic priorities and enablers in the above strategic framework.
IM/IT Strategic Priorities

1. Health Information Exchange

Strategic Context

A dominant IM/IT theme across the policy frameworks for primary and community, rural and surgical services is the need to share and exchange patient health information across the continuum of care and for patients to have access to their own health information. Health information exchange (HIE) is a term used to describe the many ways in which information is electronically shared or moved between different parts of the health system. In this context, all of the following opportunities reflect a common underlying need for coherent and interoperable HIE strategies and solutions:

- **Single Health Record for each Patient** – The call for a single health record is fundamentally rooted in the ability to see all of the information about a patient in one location. HIE strategies and solutions need to reflect this underlying need.

- **Integrated Clinical and Electronic Medical Record Systems** – Integration of distinct systems across different parts of the health system is already underway. The intent of such efforts is to expedite the flow of work and information, reducing systemic inefficiencies. HIE strategies need to provide direction to these ongoing efforts so that information can flow seamlessly without regard for the original system of collection.

- **Shared Care Planning** – Shared care planning involves multiple care providers, along with the patient having access to a common care plan for the patient, along with all of the other information associated with that plan. HIE strategies and solutions need to consider how to enable such capabilities.

- **Surgical Booking and Waitlist Management** – Many of the services that will be built in support of surgical booking and waitlist management will be directly extensible to other types of scheduling and waitlist services in the health system. HIE strategies and solutions need to consider how to ensure that the whole health system benefits from the investments made in surgical booking and waitlist management.

The impetus for common HIE strategies and solutions is rooted in current systemic inefficiencies in how patient information is exchanged today. The fundamental intention is to enable better decision making at the point of care and ensure a high-quality and sustainable patient-centered care system. This can be achieved by ensuring relevant up-to-date, complete and accurate patient information at the point of care. Currently in B.C., health information does not consistently follow the patient as they move between care settings, resulting in potentially sub-optimal care, and duplicative clinical effort and cost.

*Setting Priorities for the BC Health System* calls out two specific IM/IT accountabilities in this area:

- Expanding the capability for cooperation, enabling referrals, improved wait time management and improved exchange of patient information across service areas to support inter-professional care teams in the delivery of high quality patient care.
• Enabling electronic prescribing across the health care system continuum to support greater efficiency, safety and closed loop medication management.

Target Outcomes
The target outcomes against which progress will be measured are:
• Commitment to standardized HIE across the health sector.
• Care providers have relevant complete, accurate, up-to-date patient health information, at the point of care, to inform their decisions.
• Care providers IM/IT systems support working in inter-professional care teams.
• Care providers electronically refer patients to other care providers.
• Patients have access to their own health information.
• Prescribers submit electronic prescriptions through the provincial PharmaNet system.
• Improved medication reconciliation, resulting in greater patient safety.
• Greater efficiency managing medical and surgical wait lists.
• Achieving high levels of maturity using Healthcare Information and Management Systems Society (HIMSS) Electronic Medical Record Adoption Model (EMRAM) benchmarking system.3

Current State
While some health information exchange services exist in the B.C. health system, these services are far from fully integrated. Referring back to the current health sector IM/IT assets and services, the following elements are considered to be integral parts of the health information exchange landscape:
• Provincial Services: The Province provides common and cross-sector services, such as the electronic health record infrastructure backbone that was developed in accordance with Canada Health Infoway’s blueprint, an eHealth Viewer and Shared Health Record, and the CareConnect Services Gateway. Other provincial services include the Provincial Diagnostic Image Exchange Service, Provincial Lab Information Solution (lab results), PharmaNet (drugs), Panorama (public health), the Client and Provider Registries, telehealth scheduling, and many other legacy information exchange services with the health authorities.
• Hospital and Acute Care Services
  o Health Authority Clinical Services: Each health authority has one or more clinical information systems supporting their own operations. In some cases the same software suite is used (i.e., Cerner or Meditech) in more than one health authority, but each is generally configured in a different way and uses differing information standards.
  o Health Authority Brokers and Integration Services: A variety of services have been developed to support the exchange and distribution of information between disparate systems. These services translate messages from one information standard to another and assist in routing the results to the appropriate destination. This includes the use of common standards, like HL7 Clinical Document Architecture, to specify the encoding, structure and semantics of clinical documents for exchange.

3 Refer to Appendix C for more information on the HIMSS EMRAM maturity model.
• **Primary, Community and Residential Care Services:** Several distinct electronic medical record (EMR) systems are in use within primary care practices in B.C., supporting about 90 per cent of primary care physicians. Efforts are underway to support electronic referrals between two EMR vendor software packages. In some cases, exchanges are enabled with patients, supporting the notion of personal health record services.

The need for health information exchange services is already acknowledged by many stakeholders and efforts to advance the exchange of health information are already underway. Current efforts tend to be for specific clinical solutions within a specific geographic or organizational context. However, there are no assurances that these solutions will interoperate. A provincial vision and strategy is currently under development in an attempt to unify these efforts and lay a solid architectural foundation for future efforts.

**Recommended Key Actions to Achieve Target Outcomes**

In order to move from the current situation towards our target outcomes for health information exchange, the following recommendations have been put forward. Some of these recommendations are IM/IT-centric, while others involve further strategy development and clarification of business directions and requirements so that appropriate IM/IT solutions can be formulated and supported.

1.1 **By Fall 2015, Establish Sector-Wide Health Information Exchange Governance**

Establish sector-wide health information exchange (HIE) governance under the authority of Leadership Council and its standing committees, including leaders representing the business of health and other key health system partners, to oversee and guide clinical and IM/IT transformation in all areas of health information exchange. This governance authority will prioritize the standardization of clinical processes and exchanges of health information in the areas of most need, and establish and oversee an integrated clinical and IM/IT transformation roadmap, including project and change management plans for all HIE-related projects and investments.

Some of the key responsibilities for consideration in setting up this authority include:

- Developing the overarching strategy and architecture for HIE.
- Establishing and acting as the ongoing custodian of HIE vision, strategies and roadmaps.
- Establishing processes and controls across independent ministry and health authority capital and operating funding sources to both influence and ensure optimal allocation of funding to HIE projects. See recommendation 5.3, Common and Shared Interest Policy and Associated Funding and Resourcing Framework, for further discussion of this point.
- Articulating HIE policies, including such things as:
  - Requiring the use of HIE services both within and across organizations;
  - Discouraging net new regionally focused HIE solutions; and
  - Decommissioning existing services as and when common services become available.

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4 PITO (2014)
• Driving the creation of the HIE backbone, HIE standards, and HIE compliance mechanisms.
• Rationalizing independent and overlapping efforts and investments occurring across the sector.
• Overseeing not only new HIE efforts but also existing HIE services and operations.
• Assessing interoperability of the health system by tracking and reporting maturity of health systems interoperability by using the HIMSS EMRAM benchmarking system.

1.2 By Winter 2016, Establish the Health Information Exchange Vision, Architecture and Roadmap, through Business and Clinical Engagement
Leadership Council’s Standing Committee on IM/IT (SCIMIT), the health sector’s most senior cross organizational IM/IT governing body, has sponsored and initiated the health information exchange (HIE) project. This project includes clinical engagement and will set the necessary foundation for agreement and commitment to HIE as a provincial priority. It will establish the overall framework, conceptual model and priorities for all types of health information exchange in B.C. health (e.g., referrals, reports, care plans, advanced care directives, etc.). It will also include consideration of the role and content of a longitudinal patient health record, support for interdisciplinary care teams and shared care planning, electronic referrals (which is anticipated to be a high-priority project under the resulting HIE roadmap), and providing patients with access to their own longitudinal health record.

1.3 Establish a Roadmap for Clinical Systems Integration
Within the frame of the health information exchange vision and architecture, develop an overall provincial integration strategy to drive the connection of existing health information systems, including provincial, hospital and acute, diagnostic and pharmacy, and primary, community and residential care services. This includes:
• Rationalizing and prioritizing existing electronic medical record (EMR) integration activities which are establishing connections between EMR systems and health authority clinical information systems, the provincial lab and drug solutions, and provincial client demographic services,
• Establishing business and clinical governance of integration efforts to ensure appropriate decision-making and priority-setting, and
• Ensuring alignment of IM/IT funding with integration priorities.

1.4 Identify Foundations for Shared Care Planning
Within the frame of the HIE vision and architecture, support clinicians in developing a shared care planning vision and business architecture to establish the overall model, definitions, concepts, work processes and information standards for shared care planning – as a backdrop for determining IM/IT enablers. Considerations for this exercise include:
• Confirming the content of shared care plan
• Identifying a champion and putting in place joint clinical and business governance of shared care plan solution definition, development and implementation.
• Establishing and carrying out organizational change management strategies and plans to ensure successful transformation of current practices and systems towards new care planning models.
1.5  **Continue the Surgical Booking and Waitlist Management Solution**  
Proceed with the surgical booking and waitlist management model prepared in 2015 as the solution for surgical waitlist management, surgical booking, and synchronization of waitlist data between the various stakeholders to create a single and reliable source of information for surgical services.

1.6  **Enable Electronic Prescribing**  
Continue current efforts towards realizing the vision of electronic prescribing, to support patient safety, patient-centred care and an efficient health care system. This project includes policies supporting the use of electronic prescriptions, standards for integrating clinical systems, and supporting the subsequent systems integration and transition of community pharmacists, physicians and hospitals.

2.  **Data Sharing for Decision Support**

**Strategic Context**  
This strategic priority is motivated by the need to enhance decision support for health care research, analysis, and health system performance assessment. In particular, *Setting Priorities for the BC Health System* calls out three specific IM/IT accountabilities in this area:

- Address access, quality, standardization and timeliness of administrative and clinical care data for health system planners, policy makers, managers and researchers.
- Build informatics capacity to use data to enhance decision-making and improve outcomes at all levels of the system, while meeting privacy and security requirements.
- Review the current patchwork of legislation governing the use of health data with a view to improving its utilization while respecting patient privacy.

**Target Outcomes**  
The target outcomes against which progress will be measured are:

- Health system administrators have access to the information needed to influence and inform decisions that have an impact on the health sector.
- Health information is used to improve health outcomes and create efficiencies, while also being protected from unauthorized or inappropriate access through strong legislation and information security policies.
Current State

When considering how the health sector might further support evidence-informed health decision-making, a clear understanding is needed of where the sector is actually starting from. The current environment for sharing and analyzing health information is relatively complicated and needs to be understood from several perspectives:

- **Data Sharing in Legislation and Regulation** – The sharing of health information in the B.C. health sector is governed under a patchwork legislative framework of twelve distinct acts and regulations.\(^5\) Within this, the *Freedom of Information and Protection of Privacy Act* (FOIPPA) and the *Personal Information Protection Act* (PIPA) are the overarching acts pertaining to public and private bodies respectively. They prevail over all other legislation unless other acts specifically exempt the application of FOIPPA/PIPA or restrict their provisions to a stricter interpretation. The health sector straddles both the public and private sectors, meaning that different rules and standards apply to publicly versus privately held health information. As such, many information management provisions have been created on an ad hoc basis. The consequences of this patchwork legislative framework include:
  - Inconsistencies in the application of information management legislation and regulation across the sector;
  - Inability to readily share information across organizational domains within the health sector, or across government sectors and ministries; and,
  - Inconsistent or limited utilization of existing information sources to support and inform effective decision making due to legislative, policy, risk tolerance, privacy, process, and quality barriers

- **Managing Risks of Data Sharing** – There tends to be uneven risk tolerance towards data sharing across health sector organizations, with each organization tending to stay strictly within its sphere of influence. FOIPPA states that personal information may be collected if it is necessary for the purposes of planning or evaluating a program or activity of a public body; however when coupled with the privacy commissioner’s ruling of 2010,\(^6\) organizations tend not to disclose information unless legislation explicitly states that it can be disclosed. Given the highly sensitive nature of personal health information, organizations tend to be risk adverse when it comes to disclosing information. In particular, health information is not seen or treated as an “asset” that can inform health decision-making. Rather health information is largely viewed from the perspective of risk through a security and privacy lens. When this is contrasted with increased expectations to use health information for research purposes, and changing expectations by citizens to have their own health information follow them through the health system, it becomes clear that the current model of risk aversion as the key determinant for sharing information must be revised.

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\(^5\) Refer to Appendix B for further information on existing legislation framework.
\(^6\) The information and privacy commissioner for B.C. stated in an investigation report that the ministry did not need personal information from the health authorities since the ministry does not provide direct patient care.
• **Information Shared with and by the Ministry** – Health authorities provide non-personally identifiable data to the ministry. Physicians and other allied professionals also provide data as part of MSP billing. The ministry performs normalization and linking of data for the ministry’s administrative data and provides this to health authorities, researchers, and federal and provincial agencies for further analysis.

• **Analytic Information Quality** – The ministry requires data at the level of the individual in order to perform its stewardship accountability. For data provided by others, rather than using the data “as is”, the ministry has assumed responsibility for data quality and has a culture of getting the data “right” before publication/sharing. However, accountability for data quality correctly belongs to the originating data provider. As such, current ministry practices do not incent data providers to improve their data quality practices.

• **Analytic Data Collection Practices** – Health care data used for analytic purposes is almost exclusively collected as a by-product of care or the administration of care (e.g., MSP billing). However, the ministry requires data that isn’t necessarily tracked in clinical systems, resulting in health authorities undergoing potentially inefficient and cumbersome processes to assemble and provide data to the ministry.

• **Private Physician Sharing with the Ministry** – Outside of MSP billing, there is currently no authority to stipulate delivery of data from private physicians to the ministry, which limits analytic capabilities of the ministry in fulfilling its stewardship accountabilities.

• **Data Sharing Between Physicians** – The not-for-profit Physician Data Collaborative allows divisions of family practice to collaboratively share clinical data to improve primary care through health care projects, continuous learning, and clinical research.

• **Third Party Data Sharing Practices** – There is currently a heavy reliance on formalizing all instances of data sharing with third parties through information sharing agreements and other instruments. However, the current *General Health Information Sharing Agreement* does not cover secondary use of information with the ministry. This has resulted in cumbersome and extensive processes and documentation to fully authorize and initiate each data sharing agreement.

**Recommended Key Actions to Achieve Target Outcomes**

In order to move from the current situation towards fulfilling the accountabilities identified above, the following recommendations have been put forward:

2.1 **By Fall 2016, Establish Health Information Management Policy Framework**

Proceed with development of a health information management policy framework, ensuring patient data is adequately protected while also being used to improve health outcomes and reduce costs. This will establish a single framework for health information management in B.C., covering both public and private domains, and addressing consent, collection, use and disclosure of health information. The intent is to better enable access by decision makers to the information needed to influence and inform decisions that have an impact on the health sector.
2.2 By Fall 2016, Establish Data Sharing Accountability Framework
Articulate an accountability framework for data sharing that identifies roles and accountabilities of each and every partner in the health sector. Ideally this should be undertaken within the context of the new health information management policy framework, and include:

- Articulate the vision, principles and requirements of the data sharing framework, including topics of information governance, data stewardship, linking of data and associated services, sector-wide integration, and cross-jurisdiction sharing.
- Review of accountability options for addressing requirements.
- Review and recommended changes to existing data sharing mandates, services, processes, roles and responsibilities.
- Establishment of sector-wide authoritative bodies, if needed.
- Formulation of a transition strategy and roadmap, addressing the establishment of new mandates, services, processes, roles and responsibilities.

3. Patient-Centred Information and Technology

Strategic Context
Patient-centred care has become the driving priority for the health sector. Patient-centered care is defined as, “embedding shared values around creating the experience of individualization through recognition, respect, empathy, compassion and dignity underscored by comprehensive and understandable information provided to patients and their families through excellent communication, transparency, and partnership.”

Moving to a patient-centred care model is a long-term goal that requires a shift in health care culture, implementation of new technologies and services, and potentially changes to existing legislation. The change is driven by a number of factors including growing patient and citizen expectations for greater access to their health information and online health services, and the health systems needed for citizens to be more actively engaged in managing their health.

Setting Priorities for the BC Health System identifies the specific accountabilities that fall within the patient-centred information and technology strategic priority, including:

- “Increase information flow and personal access to health data to empower patients to be full partners in actively managing their health concerns.”
- “Expanding telehealth to support patients with chronic disease, mental illness and substance abuse; access to specialists; and acute care services in remote service areas.”

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7 Don Berwick, 2008.
Target Outcomes
The target outcomes against which progress in this area will be measured are:

- Citizens’ health records contain advanced care directives indicating their critical care wishes in the event of illness or serious injury.
- Patients in remote locations and other priority populations will have more convenient access to health services through telehealth.
- Patients are active partners in managing their health, empowered by greater access to their health information.
- Patients can share their health information with care providers.

Current State
Advancements in technology have already allowed the health system to begin to move towards a more patient-centered model of care. One such example is the expanded use of telehealth services across the province, which allow physicians to communicate with patients remotely, when geographic or other restrictions make face-to-face interactions impractical. Two telehealth projects currently underway include the First Nations telehealth expansion project and a home health monitoring project. The First Nations telehealth expansion project will extend health care delivery services via telehealth to 45 rural and remote communities. The home health monitoring project enables patients to monitor their conditions at home through remote monitoring technology, while staying connected to their care providers.

Another patient-centered technology being rolled out by the province is the new BC Services Card, which replaces the existing CareCard. It provides an identity credential that will act as the key to unlock citizen health solutions online. The new card will assist with confirming identity and MSP eligibility at all points of care, reduce fraud, increase accuracy of health record information and will eventually enable citizens’ secure online access to their health information (e.g., prescription drug information, status of claims and immunization histories).

Recommended Key Policy Actions to Achieve Target Outcomes
In order to move towards our target outcomes for patient-centred information and technology, the following recommendations have been put forward:

3.1 Develop a Patient-Centered Information and Technology Strategy
Establish the vision, intent and scope for patient-centred services within the health sector, as needed to support B.C.’s patient-centred care model. This strategy includes approaches for ensuring secure online exchange of health information with patients, whether through a secure portal or access to a personal health record. This strategy will also contemplate how patients will use technology to access the health system in a more patient centred format, for example, by booking appointments online, tracking their spot on waitlists or using email and text to communicate with care providers.
3.2 Finalize and Implement the Provincial Telehealth Strategy

Establish the vision, intent and scope for telehealth services. This will ensure a consistent approach, use of compatible technologies, and availability of services across the health sector. The strategy will identify the necessary infrastructure, architecture, standardization, and key decisions necessary to meet the needs of priority and target populations identified in Setting Priorities for the BC Health System. Linkages will also be needed to the development of practice guidelines for the use of telehealth services.

This recommendation is also an umbrella for other related telehealth efforts, including:

- **Telehealth Infrastructure Inventory** – Determine requirements and options to support Telehealth across the continuum of care (currently underway);
- **Telehealth Oversight and Operations** – Establish provincial telehealth governance and accountability, clinical leadership and an operational support model;
- **Telehealth Expansion** – Enable telehealth into primary and community settings using existing network infrastructure and services. Telehealth expansion will also consider how private vendor telehealth services could be leveraged while ensuring:
  - privacy and security of patient information;
  - longitudinal, attached patient care;
  - clinical information from a telehealth consultation is included in the electronic health record; and,
  - sustainability of the health care system.

3.3 Expand Home Health Monitoring Services

Home health monitoring (HHM) is a suite of services targeted at educating and monitoring patients with chronic conditions in the home. A project is currently underway by Island, Interior and Fraser health authorities to pilot the use and integration of HHM services. Results of these efforts should be used to expand HHM services for key patient populations across the province.

**IM/IT Strategic Enablers**

While the IM/IT strategic priorities just discussed are the most pressing from a clinical perspective, there are also foundational changes that must be addressed in order to fully and effectively deliver each priority. This part of the paper discusses three IM/IT strategic enablers:

- Health Information Standardization
- IM/IT Governance and Investment
- Health Shared Services
4. Health Information Standardization

Strategic Context
Health information standardization (HIS) is directed towards enhancing health care quality and patient safety through the standardization of health information. Standardization is a requirement for realization of health information exchange (HIE) expectations – HIE addresses procedural and technical standardization (i.e., processes and systems for information exchange), while HIS addresses the content of information exchanges.

Current sector-level capabilities towards HIS are limited and must be strengthened as part of advancing the IM/IT strategic agenda. This includes sector-level capabilities to develop, agree upon, implement and enforce common health information standards. Within this frame, specific standards for priority information exchanges are required, from basic administrative information through to clinical information.

Setting Priorities for the BC Health System calls out three specific IM/IT accountabilities in this area:
- Harmonize and standardize clinical data sets for improved, evidence based decision support in clinical information systems at the point of care.
- Advance and standardize implementation and adoption of clinical information systems at the point of care.
- Address access, quality, standardization and timeliness of administrative and clinical care data for health system planners, policy makers and researchers.

Target Outcomes
The target state outcomes against which progress will be measured are:
- A recognized provincial body of IM standards.
- Organizations clearly define IM and IT functions and responsibilities and understand the need for these two functions to operate together.
- Provincial adoption of information standards, enabling system integration.
- Patient health information is recorded, accessed and transferred in a consistent and repeatable manner across the health sector. The use of standard clinical vocabularies and structured data organization (ontologies) greatly enhances the ability of clinical systems to interoperate, allowing the data to be used in a meaningful way.
Current State
The current landscape surrounding health information standardization in B.C. is disparate, with pockets of promising work and progress. Some of the key aspects of this current landscape include:

- **Provincial Standards Authority** – There has been no provincial health information standards authority for the past decade, meaning that there has been no basis from which to drive provincial information standards development and adoption. While a Health Information Standards Council was in place, it was disbanded in 2003. This shortfall has been recently addressed with the formation of a Health Information Standards standing committee under the provincial authority of the Standing Committee on Health Sector IM/IT.

- **Provincial Information Standards** – There is no single, easily referenced source of B.C. health information standards. Various standards, conventions and policies exist throughout the system (e.g., LOINC, SNOMED) applying to a variety of areas. Some standards development work is occurring, but it is generally only for establishing regional or local standards to specific clinical concerns. This creates a landscape of inconsistent information standards that inhibits the exchange of health information, jeopardizing the Province’s ability to realize the potential benefits of health information exchange. This is acknowledged as a valid concern and some inter-regional attempts are being made to move toward provincial standards (e.g., trial and adoption of Clinical Document Architecture standards).

- **Funding and Development of Information Standards** – Funding for standards development tends to be bundled within IM/IT projects, and as such standards tend to be placed within the context of the business problem addressed by the IM/IT project — and not the needs of the health system as a whole. As such, a larger perspective isn’t generally taken, nor do IM/IT project timelines typically allow for provincial considerations.

- **Consequences of Current Standards** – The lack of provincial-level standardized information makes it challenging to integrate and leverage data for decision-making purposes. Similarly the existence of multiple localized standards lead to risks for patient safety (e.g., through misinterpretation) or risks of duplicative expenditures (e.g., due to lack of trust or understanding of tests previously ordered by other clinicians).

- **Costs of Standards Conformance** – B.C. has significant existing investments in clinical information systems that use locally developed code sets and information standards. This inhibits abilities to more widely adopt consistent information standards. Typically there is a significant cost attached to bringing information up to standard, acting as a disabler towards further information sharing and integration. Even if consistent standards are adopted, standards themselves are subject to continual evolution. This means that alignment of existing systems and information to new standards can continue to be challenging and costly.
Recommended Key Actions to Achieve Target Outcomes

In order to move from the current situation towards our target outcomes for health information standardization, a number of potential actions should be considered. These include:

4.1 Establish Provincial Information Standards Governance
Establish a center of accountability to drive development, promotion and conformance to sector-wide BC information management standards. Specific considerations include:

- Empower an IM/IT Health Standards Standing Committee within the Leadership Council governance model to lead the development of provincial policies that will be enforced across the sector.
- Create and publish an authoritative compilation of information management standards that can be easily referenced. The first set of standards must focus on administrative data, including, for example, provider, location and then the standards required to execute health information exchange priorities (e.g., electronic referrals, electronic prescribing).
- Develop an information management capability strategy to enhance the health sector’s capabilities for standardizing electronic information, and enable future system integration and decision-making at the point of care.

4.2 Establish Provincial Information Standards Service Responsibilities
Establish responsibilities for developing and overseeing the adoption and implementation of provincial-level health information standards. This includes acting as the “arms and legs” for the provincial information standards governance referenced above, with responsibilities for leading or coordinating standards development in partnership with health authority and private physician stakeholders. Fulfillment of these responsibilities would require ongoing access to informatics professionals to support projects in the development of provincial standards.

4.3 Drive Foundational Provincial Information Standards
Drive standards development and adoption in foundational areas, including client identity, use of the personal health number, provider identity, location identifiers, and commonly used clinical references like problem lists and allergies, and using agreed upon health information vocabularies. The use of such standard identifiers allows linking and pattern recognition across datasets, resulting in improved analytical capability and quality of decision-making. Standardization of these items is particularly relevant to integration, aggregation and analysis of clinical data, as well as the successful implementation of electronic prescribing and electronic referral services.

4.4 Establish Project Gating for Standards Compliance
Gate the initiation of projects and stipulate that all procurement activities conducted within the health sector reflect established provincial information management requirements, with a view to driving the adoption of provincial information standards. This would likely need to be tied with the financial review process, as described under in the “IM/IT Governance and Investment” section below.
5. IM/IT Governance and Investment

Strategic Context
Transforming B.C.’s health IM/IT system is about more than new technology or information systems; it requires a shift in how organizations across the province work together. Health organizations must work collaboratively towards a shared vision for IM/IT and ensure investment and effort are co-ordinated and maximized to the benefit of all B.C. residents. Independent organizational efforts to enable business and clinical transformation through IM/IT are no longer appropriate or sustainable. If we are to advance the health system strategy, IM/IT must shift to addressing common or shared interests collectively.

Target Outcomes
The target state outcomes against which progress will be measured are:

- Alignment of IM/IT investment and effort across the health sector in accordance with system-wide priorities.
- Transparent processes, including decision making and priority setting, through the creation of a single, executive governing body for oversight of IM/IT priorities.

Current State
The current approach to IM/IT governance and investment across publicly-funded B.C. health organizations is largely organizationally-centric with some efforts towards common investments for shared needs. Some key aspects include:

- **Organizational Placement of IM/IT** – IM/IT in B.C. has evolved as a result of the large and complex distributed health organizational frame that exists. Over the past several decades, the ministry, health authorities and private practices have all developed their own IM/IT services and solutions, resulting in a diversity of IM/IT services and solutions across the province – which in turn resulted in disparate and disconnected islands of health information throughout the health system. This has been partially addressed through recent efforts such as the consolidation of IM/IT services in the Lower Mainland and also with the establishment of Health Shared Services BC.

- **Governance of IM/IT** – Historically, IM/IT governance has followed the lines of the largely independent organizational authorities within the health sector. This is counter-productive to achieving the collective interests of the health system strategy. Recognizing this, a new governing body has been established under Leadership Council to address common and shared interests of the ministry and the health authorities (called SCIMIT – the Standing Committee on Health Sector IM/IT).

- **Planning for IM/IT** – Provincial strategy and direction for IM/IT are provided through the ministry. As health authorities have historically also undertaken their own IM/IT strategy and planning, a misalignment of inter-organizational planning and funding cycles exists, resulting in provincial strategies that are not consistently incorporated. This is beginning to be addressed through SCIMIT where strategies and plans of common or shared interest are mutually formulated and reviewed.
• **Funding of IM/IT** – Multiple independent funding sources and channels exist for IM/IT investment. Funding sources includes central government (e.g., Deputy Ministers’ Council on Transformation and Technology), the ministry, health authority budgets, physician organizations and colleges, and CHI. Given the diversity of the groups involved, it has been difficult to ensure alignment of independently governed IM/IT investments towards common strategic priorities.

**Recommended Key Actions to Achieve Target Outcomes**

In order to move from the current situation towards our target outcomes for IM/IT Governance and Investment, the following recommendation should be considered:

5.1 **Health Authorities to Commit to Provincial Accountabilities**

Increase provincial accountabilities and expectations of health authority executive and leadership roles (across IM/IT, finance, planning and clinicians), with a view to incenting them to advance common and shared interests (specifically HIE) from a provincial rather than regional perspective.

Initially the focus should be towards provincial accountabilities for chief information officers, chief medical information officers (CMIO) and chief technology officers. For example, the focus of new CMIO accountabilities could include development, adoption and implementation of provincial information standards.

Consideration should also be given to extending this option upward to include provincial IM/IT accountabilities for health authority boards, CEOs and chief financial officers, or downward to significant IM/IT leadership roles such as enterprise architecture, strategy, planning, and project management. Note that this proposed policy direction should also be considered in combination with the proposed directions Explicit Funding Linkages and IM/IT Planning Cycle Integration.

5.2 **Make Explicit IM/IT Funding Expectations and Linkages**

Make better use of existing authority mechanisms to advance the strategic IM/IT agenda expressed in this document, with a view to ensuring the IM/IT funding is directed towards the provincial agenda.

- The IM/IT and Financial standing committees reporting to Leadership Council should be directly linked. In addition, Leadership Council should provide direction to ensure funding for all major IM/IT investments have a provincial focus and reflect the priorities of the health care strategies.
- Clarify expectations that IM/IT investments by health authorities must align with the objectives of provincial, common and shared interest (e.g., health information exchange, standardization, data sharing and informatics, Patients as Partners or shared services).
5.3 Develop a Common and Shared Interest Policy and Associated Funding and Resourcing Framework

Establish a framework and process for IM/IT funding and resourcing of efforts where those efforts are of common or shared interest, with the intent to align and collaborate on IM/IT strategic priorities and expenditures. This would initially be focused towards health information exchange (HIE) interests as a way of piloting the concept, and then the scope could be expanded to include any IM/IT project of common or shared interest. Some potential considerations include:

- Establishing a multi-year HIE investment roadmap and annual HIE fund. The purpose will be to communicate the year to year focus, support annual HIE funding and ensure achievement of the longer term transformational outcomes, including high levels of HIMSS EMRAM maturity.
- Using a portfolio management approach to investments (e.g., treat all HIE-related efforts across the sector as a portfolio, and manage investment to better deliver on the HIE vision and architecture).
- Using the ministry to act as custodian and administrator of the funding made available, year to year.
- Including linkages to the Financial Reporting Subcommittee to support appropriate cost sharing across the sector.
- Requiring existing services to be brought up to the same standard level, enabling interoperability of existing systems and information, and thereby fairly distributing the costs across all organizational partners.
- Establishing processes or other means for ensuring that IM/IT investments made external to the authority of the ministry and health authorities remain in line with provincial intents and strategies (e.g., IM/IT investments funded by Doctors of BC joint clinical committees).

5.4 Integrate IM/IT Planning Cycles Across the Health Sector

Synchronize ministry and health authority planning cycles and deliverables to drive consistency of purpose and direction into IM/IT efforts across the sector. This would include:

- Defined linkages to larger organizational planning and budgeting cycles.
- Defined linkages between provincial and regional IM/IT strategies and plans.
- Common review and approval processes and responsibilities.
- Consistency of planning horizons, deliverables, methods and approaches.
- Clear expectations that all organizations will collaborate and co-ordinate their strategies, plans, investments and activities in areas of provincial, common and shared interest.

5.5 Develop an IM/IT Capital Planning and Expenditure Review Process

Develop an IM/IT capital review process for publicly-funded health sector investments, regardless of the funding source. The underlying intent of this process is towards more effective alignment of funding to the provincial, strategic IM/IT agenda, through monitoring and control of potential investments. This would need to be developed within the context of the policies for the Common and Shared Interest Funding and Resourcing Framework and the IM/IT Planning Cycle Integration. It could also be piloted...
within the context of health information exchange and later expanded to include all expenditures of common or shared interest. This capital review process would consider:

- Inclusion of investments and filtering criteria,
- Planning horizon (multi-year with focus on current and following year),
- Controls for initiation of work,
- Gated release of funding to ensure tracking and alignment, and
- Post-investment reviews.

5.6 **Develop Change Management Strategy for Key Policy Changes**

Resource, develop and implement a comprehensive change management strategy to support successful implementation of the provincial IM/IT strategic plan and recommended key actions in this paper. The change management strategy will focus on: creating awareness of the provincial agenda and need for change; building desire and commitment to the change; knowledge of what exactly will be changing when; ability to support the change; and, reinforcement of the change.

6. **Shared IM/IT Services**

**Strategic Context**

Within the context of IM/IT in the B.C. health sector, this strategic priority further advances the IM/IT service centre concept, which was established by government to provide shared delivery and optimization of technology services common to all health authorities. This IM/IT service centre concept has been implemented as one of the lines of business within the mandate of Health Shared Services BC (HSSBC). The purpose of all of HSSBC’s lines of business is to improve administrative cost effectiveness and enhance service quality for all health authorities.

The IM/IT services provided under the HSSBC model are determined through collaboration between the ministry and the health authorities. HSSBC has the responsibility to formulate an overall vision for shared IM/IT services and the mandate to develop new services and drive process change to meet the emerging needs of partner organizations. By reducing costs and risks while increasing predictability, capacity and opportunity, HSSBC enables health authorities to have more resources available to apply to direct patient care.

**Target Outcomes**

The target state outcomes for shared IM/IT services against which progress will be measured are:

- **Proof**: Shared services provides demonstrable and significant improvements to administrative cost effectiveness and service quality for all health authorities
- **Trust**: Health sector leaders are committed to shared services and view the shared services organization as a trusted partner in health care service delivery
- **Guidance**: Effective governance bodies and processes are in place to both guide and ensure delivery of meaningful and appropriate shared IM/IT business and technology services to health authorities
- **Capability**: The shared services organization has the maturity, capabilities and resources needed to lead IM/IT service transformation efforts

**Current State**
The use of an IM/IT shared services model has been in place for only a few years within the B.C. health sector, under the mandate of Health Shared Services BC (HSSBC). Progress has been made with the shared use of the Kamloops Data Centre and with transition to a provincial desktop management service. However shared IM/IT services are still not evenly deployed across health authorities and introduction of new services has been challenging. Amongst the key challenges:

- **Governance, Funding and Measurement** – At this point, there is no shared vision and limited buy-in from leadership regarding shared IM/IT service delivery in the health sector. This is exacerbated by a lack of clarity regarding governance and funding models for shared services, including possible performance measures.

- **Trust and Change Management** – Given the shift from autonomous services to shared services, there has been some natural resistance to change. Change management efforts have been limited or ineffective, resulting in a lack of trust and buy-in to the HSSBC model amongst key health care partners.

- **Roles and Accountabilities** – There has been a lack of shared understanding of the roles and accountabilities of both HSSBC and its clients, the health authorities, in the area of shared IM/IT services. Further clarity is needed as the basis for effective working relationships.

**Recommended Key Actions to Achieve Target Outcomes**
In order to move towards the target outcomes for shared health IM/IT services, the following recommendation should be considered:

6.1 **Formalize Organizational Roles, Mandates and Establish a Plan of Action to Transition to Shared IM/IT Services Model**
Establish a clear, shared IM/IT business and technology services vision, model and mandate, including organizational roles and any other functional responsibilities that may be required as sector-level services come to fruition, including integration and conformance services. Confirm the scope of services to be delivered through a shared services model. Back this with a transformation plan to expedite the transition to the shared IM/IT services model.
# Appendix A: Glossary of Terms

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<tr>
<th>Term</th>
<th>Definition</th>
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<tr>
<td>Analytics</td>
<td>Gleaning useful information from statistics, tools, and processes used to gather and assess pieces of information/data that can be used to inform decision making, demonstrate performance, and/or measure outcomes. Analytics extracts meaning from data.</td>
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| Care Provider         | Organizations or individuals authorized to provide health care services and/or goods. These are either an individual that has the authority to act in a specific role or a corporate body or association. Under this definition providers include:  
  - Individual health care providers (e.g., doctors, nurses, dentists, chiropractors, physiotherapists, researchers)  
  - Organizational health care providers (e.g., private medical clinics, health authorities)  
  - Health care administrators (e.g., Ministry of Health, health insurers)  
  - Health care suppliers (pharmaceutical companies, analytics organizations/universities, laboratories) |
| Clinical Information System | Clinical information systems supporting acute, community and primary care have been implemented in all health authorities. The two main strategic systems used are Cerner and Meditech, along with PARIS, Profile, and others. Legacy systems are in the process of being replaced with strategic solutions, particularly in the lower mainland with the Clinical System Transformation project. These systems are essential tools enabling delivery of high quality care in health authorities across the province. |
| Electronic Medical Record | An electronic medical record (EMR) system is a clinical information system used most often in a medical practice setting. It contains individual patient information such as clinical assessment, care planning details, individual interventions and health services, as well as providing access to other health services. An EMR includes other practice management functions such as patient registration, scheduling and billing. |
| Enterprise Architecture | Gartner Group defines enterprise architecture as “the process of translating business vision and strategy into effective enterprise change by creating, communicating, and improving the key principles and models that describe the enterprise’s future state and enable its evolution.” |
| Health System Strategy | Refers to the Setting Priorities for the BC Health System document published by the Ministry of Health in February of 2014. |
| Integration           | Integration services are detailed design and implementation services that link application functionality (custom software or package software) and/or data with each other or with the established or planned IT infrastructure. (Gartner) |
| Interoperability      | In health care, interoperability is the ability of different information technology systems across organizational boundaries to communicate, exchange data, and use the information that has been exchanged, in order to improve health delivery and health outcomes for individuals and communities. (HIMMS, condensed) |
| Informatics | Information technology, and its systems, processes, and policies, as a tool for the management and delivery of health care. This includes activities related to collection, use, and disclosure of information. |
| Information Management | A method of using technology to collect, process and condense information with a goal of efficient management. (Gartner) |
| Information Technology | This is the common term for the entire spectrum of technologies for information processing, including software, hardware, communications technologies and related services. (Gartner) |
| Infrastructure | Infrastructure encompasses the hardware, software, communication networks, and facilities necessary to deliver, monitor and support information technology services. |
| Provincial Electronic Health Record | Provides the core technical infrastructure to allow provincial, hospital and physician office information systems to connect to each other. It allows authorized clinicians to securely access patient health information, in any care setting, and share the information electronically. B.C’s electronic health record is an innovation that supports more efficient health care delivery across service lines. |
| Telehealth | A complementary health care delivery service that uses information and communication technologies to connect health care providers, patients and educators over distance to enable clinical consultation, health care management, general health promotion and continuing medication education. 

There are different modalities of Telehealth offered in BC:

**Real time:** Connects patients to providers and educators in real time via videoconferencing (e.g., B.C. supports over 70 clinical services like telemental health, telethoracics, teleoncology, telecardiology), and via the HealthLink BC 8-1-1 phone line (telephony);

**Store and forward:** Connects providers and patients via store and forward tools that capture patient data and images for diagnostics (E.g. teledermatology, teleophthalmology, telewoundcare);

**Remote Patient Monitoring:** Connects providers and patients using remote patient monitoring tools to allow patient vital signs to be sent to nurses to proactively monitor a patient’s health (e.g. congestive heart failure, chronic obstructive pulmonary disease). |
Appendix B: Key Pieces of “Patchwork” Health Information Legislation

Continuing Care Act, s. 5
Authorizes the ministry and a health authority to require a person to provide information respecting the person or the members of the person’s family thought necessary for the proper administration of the act.

E-Health (Personal Health Information Access and Protection of Privacy) Act
Governs the collection, use and disclosure of personal health information through electronic databases of the ministry and health authorities that have been designated by the minister as “health information banks.” To date, only applied to a repository of lab data that is part of the provincial electronic health record system.

Freedom of Information and Protection of Privacy Act
Applies to personal information that is in the custody or control of the ministry, health authorities, agencies, boards and commissions in the health sector (including the Medical Services Commission) and professional regulatory bodies.

Health Act, ss. 9 and 10
The BC Cancer Agency is authorized to collect, use and disclose information for the purpose of medical research. The health status registry may request that a person provide it with information concerning congenital anomalies, genetic conditions or chronic handicapping conditions of individuals.

Hospital Insurance Act, s. 7
Authorizes the ministry or a hospital to require a person to provide information respecting the person or the members of the person’s family thought necessary for the proper administration of the act.

Laboratory Services Act (not in force)
Governs the collection, use and disclosure of personal information by the ministry in relation to the payment of benefits for laboratory services.

Medicare Protection Act, s. 49
Section 49 provides that individuals must keep matters about beneficiaries and practitioners that come to their knowledge in the course of administering the act confidential subject to certain exceptions.

Ministry of Health Act, Part 2
Authorizes the collection, use and disclosure of personal information by the ministry from a public body for a stewardship purpose.

Personal Information Protection Act
Applies to personal information that is in the custody or control of organizations, including private practices of health professionals and private labs.

Pharmaceutical Services Act
Governs the collection, use and disclosure of personal information by the ministry in relation to the payment of benefits for pharmaceutical services. Additionally, it governs access to and recording of information in prescribed information management technology.

Public Health Act
Part 1, Division 3 sets our purposes for collection, use and disclosure of personal information related to reporting of reporting disease, health hazards and other matters.

Health Act Communicable Disease Regulation
Governs the collection, use and disclosure of personal information related to public health matters, including mandatory reporting of infectious diseases or health hazards.
Appendix C: Synopsis of the Electronic Medical Record Adoption Model

The Electronic Medical Record Adoption Model (EMRAM) is an eight-step process that allows organizations to analyze their level of electronic medical record (EMR) adoption, against other organizations, nationally and internationally. Each level of maturity involves more electronic capability and functions, moving from paper-based to complete semantic interoperability, or the ability of systems to exchange and interpret data. This model is applicable to assessing maturity of HIE adoption and is proposed by this paper as a method for benchmarking progress in British Columbia.

Synopsis of EMRAM

HIMSS (Healthcare Information and Management Systems Society) Analytics EMRAM incorporates methodology and algorithms to automatically score the more than 5,400 U.S. and approximately 650 Canadian hospitals in the HIMSS Analytics database relative to their EMR capabilities. Ranging from limited ancillary department systems through a paperless EMR environment, EMRAM scores provide peer comparisons for hospital organizations as they strategize their path to implementing a complete EMR and participation in an electronic health record.

The stages of the model are as follows:

Stage 0: The organization has not installed all of the three key ancillary department systems (laboratory, pharmacy, and radiology).

Stage 1: All three major ancillary clinical systems are installed (i.e., pharmacy, laboratory, and radiology).

Stage 2: Major ancillary clinical systems feed data to a clinical data repository (CDR) that provides physician access for reviewing all orders and results. The CDR contains a controlled medical vocabulary, and the clinical decision support/rules engine for rudimentary conflict checking. Information from document imaging systems may be linked to the CDR at this stage. The hospital may be health information exchange capable at this stage and can share whatever information it has in the CDR with other patient care stakeholders.

Stage 3: Nursing/clinical documentation (e.g., vital signs, flow sheets, nursing notes, electronic medication administration record) is required and is implemented and integrated with the clinical data repository for at least one inpatient service in the hospital; care plan charting is scored with extra points. The Electronic Medication Administration Record application is implemented. The first level of clinical decision support is implemented to conduct error checking with order entry (i.e., drug/drug, drug/food, drug/lab conflict checking normally found in the pharmacy information system). Medical image access from picture archive and communication systems is available for access by physicians outside the radiology department via the organization’s intranet.

Stage 4: Computerized Practitioner Order Entry (CPOE) for use by any clinician licensed to create orders is added to the nursing and clinical data repository environment along with the second level of clinical decision support capabilities related to evidence based medicine protocols. If one inpatient service area has implemented CPOE with physicians entering orders and completed the previous stages, then this stage has been achieved.

Stage 5: The closed loop medication administration with bar coded unit dose medications environment is fully implemented. The eMAR and bar coding or other auto identification technology, such as radio frequency identification, are implemented and integrated with CPOE and pharmacy to maximize point of care patient safety processes for medication administration. The five rights of medication administration are verified at the bedside with scanning of the bar code on the unit dose medication and the patient ID.

Stage 6: Full physician documentation with structured templates and discrete data is implemented for at least one inpatient care service area for progress notes, consult notes, discharge summaries or problem list & diagnosis list maintenance. Level three of clinical decision support provides guidance for all clinician activities related to protocols and outcomes in the form of variance and compliance alerts. A full complement of radiology picture archive and communication systems (PACS) provides medical images to physicians via an intranet and displaces all film-based images. Cardiology PACS and document imaging are scored with extra points.
**Stage 7:** The hospital no longer uses paper charts to deliver and manage patient care and has a mixture of discrete data, document images, and medical images within its electronic medical record environment. Data warehousing is being used to analyze patterns of clinical data to improve quality of care and patient safety and care delivery efficiency. Clinical information can be readily shared via standardized electronic transactions (i.e., charge coupled device) with all entities that are authorized to treat the patient, or a health information exchange (i.e., other non-associated hospitals, ambulatory clinics, sub-acute environments, employers, payers and patients in a data sharing environment). The hospital demonstrates summary data continuity for all hospital services (e.g., inpatient, outpatient, emergency department, and with any owned or managed ambulatory clinics).

**Canadian EMR Adoption Scores**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Cumulative Capabilities</th>
<th>2014 Q2</th>
<th>2014 Q3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 7</td>
<td>Complete EMR; CCD transactions to share data; Data warehousing; Data continuity with ED, ambulatory, OP</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Stage 6</td>
<td>Physician documentation (structured templates), full CDSS (variance &amp; compliance), full R-PACS</td>
<td>0.6%</td>
<td>0.6%</td>
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<tr>
<td>Stage 5</td>
<td>Closed loop medication administration</td>
<td>0.5%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Stage 4</td>
<td>CPOE, Clinical Decision Support (clinical protocols)</td>
<td>3.6%</td>
<td>3.4%</td>
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<tr>
<td>Stage 3</td>
<td>Nursing/clinical documentation (flow sheets), CDSS (error checking), PACS available outside Radiology</td>
<td>32.5%</td>
<td>32.1%</td>
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<tr>
<td>Stage 2</td>
<td>CDR, Controlled Medical Vocabulary, CDS, may have Document Imaging; HIE capable</td>
<td>28.9%</td>
<td>29.5%</td>
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<tr>
<td>Stage 1</td>
<td>Ancillaries - Lab, Rad, Pharmacy - All Installed</td>
<td>14.5%</td>
<td>14.6%</td>
</tr>
<tr>
<td>Stage 0</td>
<td>All Three Ancillaries Not Installed</td>
<td>19.4%</td>
<td>19.1%</td>
</tr>
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</table>

Data from HIMSS Analytics® Database ©2014  
N = 640  N = 638

PLEASE NOTE: These graphics are an abbreviated version of the HIMSS Analytics EMR Adoption Model. All organizations must secure permission to post our model on any public notices and to obtain their score they must complete the HIMSS Analytics study prior to validation of their score.
## Comparative Provincial Scores

<table>
<thead>
<tr>
<th>Province</th>
<th>Mean</th>
<th>Min</th>
<th>Max</th>
<th>Median</th>
<th>Number</th>
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<td>3.1840</td>
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<td>Nova Scotia</td>
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<td>Yukon Territory</td>
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<td>3.1230</td>
<td>3.1230</td>
<td>3.1230</td>
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References


