Executive Summary

In 2015, the Council of Medical Officers of Health (COMOH) established an Electronic Medical Records (EMR) Working Group. This working group was mandated to:

i) explore and provide recommendations on a standard EMR system for all Ontario public health units;
ii) provide recommendations for data sharing and access between public health units; and,
iii) provide recommendations on standardized data elements of EMR systems to enable data sharing and reporting in Ontario.

Specifically, this report supports the objective of the COMOH Working Group Members to pursue a standard EMR system for all Ontario Public Health units and investigates the current state of EMR implementation within public health units. Members of the COMOH Working Group finalized in 2016 their interest in collaborating on the preparatory phase this goal, information gathering and established Task Groups to address funding, procurement, system requirements, lessons learned and interoperability including the digital footprint in Ontario.

Through surveys, one-to-one telephone conversations/interviews, meetings and presentations this report brings together the accumulation of result aligned per six key theme areas. The executive summary is best described through the task groups recommendations.

The COMOH EMR Working Group request the Chief Medical Officer of Health of Ontario to:

Interoperability

1. Accelerate work to ensure Panorama's immunization module is inter-operable with both PHU and physician-based EMR systems;
   a. For PHU EMR procurements, require that EMR’s adopt the provincial DHR:HL7-FHIR Standard that provide interoperability capabilities between PHU’s to ensure sharing of EMR specific data using a similar CDR mechanism as used by Hospitals and/or directly with Ontario CDR
   b. Request that MOHLTC work to provide a consistent shared patient/client view across multiple provincial systems including Panorama, iPHIS and ISCIS and integration with Provincial Client Registry (EMPI)

2. begin work to ensure iPHIS, ISCIS and other key provincial public health information systems are inter-operable with PHU EMR systems by;
   a. Implement better OLIS Integration with iPHIS
   b. Sharing and synchronizing client demographic information by leveraging provincial client registry

3. Develop standard and operating procedures to ensure consistent usage of provincial information systems and local EMR in alignment with provincial initiative including "Immunization 2020" and "Patient’s First";
4. Update the Ontario Public Health Standards, Immunization Protocol to use Panorama as the immunization repository for all immunizations for all ages;

5. Update eHealth Ontario strategy/blueprint etc. to ensure public health and their systems are included.

**EMR Selection, Procurement and Access for PHUs in Ontario**

1. That all Ontario PHUs obtain access to clinical viewers used in the Connecting Ontario Hub;

2. That PHUs select no more than 2, but preferably one standard EMR vendor for PHUs and encourage PHUs to migrate to this standard. That EMR Vendor provide inter-PHU capabilities and integration and view to a ASP model and include integration with:
   1. The Ontario Immunization Repository
   2. The Provincial Client Registry
   3. The Provincial Provider Registry
   4. The Provincial Authentication Mechanism
   5. The Ontario Provincial Laboratory Information System (OLIS)

3. Leverage EMR within each of the ConnectingOntario hubs (cSWO, cNEO, cGTA);

4. Explore options to leverage existing physician EMRs certified by OntarioMD or connect with hospitals who have larger more robust hospital information systems (e.g. CERNER, EPIC) that address the needs of Public Health.

**Partnering and Collaboration**

1. Public health partner with a health care organization that has already implemented an EMR and has a contract with the vendor that allows the option to offer the contract to other organizations, piggy back. This would be an excellent option for PHUs, as they would be able to link onto an existing installation with a data center and servers already established. This reduces the cost of installing a separate, new data center;

2. The second option would be to partner with a procurement agency, if wanting to purchase an EMR for a group of PHUs in a LHIN or ConnectingOntario Hub, such as an existing SSO or Group Purchasing Organization (GPOs). HMMS, Transform and Shared Services West have expressed interest in supporting this initiative for PHUs, with the addition of industry experts and technical support;

3. Collaborate within ConnectingOntario Hubs, LHINs and the new regions, MOHLTC and eHealth Ontario to achieve EMR interoperability. Investigate the impact of local health system reform, Patient's First to leverage data sharing and technology. Public health units may benefit from shared information and tools arising from forming new relationships between boards of health and LHINs and their regions;

4. Work closely with eHealth Ontario to develop a provincial roll out strategy for ConnectingOntario for all public health units who have not engaged with one of the ConnectingOntario hubs. The strategy should include:
   a. communicating the benefits to local health units;
   b. working with public health units and engage them as partners.
Funding

1. Investigate funding available through alternate channels such as Canada Health Infoway;

2. Leveraging existing ConnectingOntario hubs and use of their assets may support this approach. Other funding sources may become available if a collaborative approach is taken for an EMR and especially if an ASP model which is preferred;

3. Single EMR or not, partner to cost share for project management, support, training, and implementation be considered along with a per ConnectingOntario Hubs (cNEO, cSWO, cGTA) model.

Project Management

1. Use project management methodology with a project leader who is supported by a steering committee or project management team. Choose representatives for the project management team who have different skill sets and/or represent different groups of end-users. IT is an essential member of the team.

2. Hire a Project Management Director as soon as possible to ensure that the right staff members are acquired for the project and to work with Public Health Leaders regardless of acquisition approach for EMR.

3. Establish project charters early on to ensure common understanding of scope and deliverables. Project charters should be used to define the scope of the project, how the project is being rolled out, the roles and responsibilities of the project team and staff, and the limits to roll-out. It is especially important the project lead prioritizes this project and does not get distracted by other responsibilities.

Operationalize Recommendations

1. COMOH identify a group of members or steering committee of senior decision makers including COMOH, MOHLTC, aPHA, OPHA, PHO and subject matter experts that would lead the discussion of public health integration within provincial strategy for the electronic health record or digital space recognizing Patient First. Because of the importance of Public Health as a contributing member to the digital landscape in Ontario, it is suggested that a project with a designate project lead/director be struck to promote and influence the decision-making and processes pertaining to a provincial electronic health record, inter-operability, data hub, etc.;

2. COMOH discuss and action approach for standard EMR for PHUs one system for province, by hub.

The work of the four Task Groups (Requirements, Funding and Shared Purchase Service, Lessons Learned, Interoperability) was outstanding and completed while fulfilling regular roles in their PHUs. This report and the information contained is provided because of the collective efforts of all involved. The recommendations reflect this.

Appendix B: Task Groups and Members
Overview

Implementing a standard electronic medical record system robust enough to support a provincial public health mandate is a vast undertaking with required changes to both process and workflow. Most PHUs do not have the funding to undertake such an initiative and look to other sources. It was realized early on that funding was no longer available with OntarioMD and no other source is yet to be identified. Funding for this type of collaborative approach is crucial and may be more readily available through initiatives in the ConnectingOntario Hubs as they look at integration and opportunities whereby PHUs could potentially connect with larger more robust systems and leverage existing relationships to become a corner stone service provider within an existing group or contract. As hospitals look to enhance their systems either through upgrade or purchase, PHUs could piggy back on these opportunities. Alternatively, utilizing an existing EMR implemented in one of thirteen PHUs presents a further option.

EMR interoperability is a cornerstone to moving to a standard EMR. Understand existing interfaces and interoperability between public health information systems used by Ontario public health units (PHUs) and to develop recommendations on how PHUs could be better integrated with EHR (Electronic Health Record) /EMR (Electronic Medical Record) solutions is a key component of this report. (For the purpose of this report, the terms EMR/EHR systems are synonymous)

Collaboration among health care service providers is consistent with the current focus to enhance accountability and transparency while embracing a collaborative approach as outlined in the Patient First: Action Plan for Health Care in Ontario.

Minister Dr. Eric Hoskins Speech of February 2, 2015 references stronger links between population and public health and other health services; integration of local population and public health planning with other health services, formalize linkages between LHINS and public health units and connectivity in the context of new technologies and the opportunities to provide faster and more holistic support. All these key points only serve to amplify the need to develop relationships and opportunities at the region, LHIN and provincial level such as with ConnectingOntario Hubs, but most importantly connectivity among and with information systems, use of clinical viewers and establishing robust data hubs.

Protecting Ontario’s universal public health care system is a priority for the Minister of Health. Public Health Unit’s ability to deliver on Population Health as part of Patients First: Action Plan for Health Care is an important focus point. The Action Plan emphasizes four key objectives where Public Health plays an instrumental role within all:

1. Access – Providing faster access to the right care
2. Connect – Delivering better coordinated and integrated care in the community
3. Inform – Providing the education, information, and transparency they need to make the right decision about their health
4. Protect – Making decisions based on value and quality, to sustain the system for
generations to come

The Ontario Public Health Association (OHPA) had an exhilarating and spot on response to
Patient First and suffice to say we in Public Health have initiated the journey to improve our
services, our relationships, our collaboration at the local level. We are great at these and we can

Further, there is the option of embracing a shared purchase model or combined purchasing for an
information system by Public Heath Units that creates an opportunity to consolidate
requirements and facilitate the procurement of a more robust EMR if so desired. Collaborative
procurement will benefit public health units as there will be ability to share the costs of project
management, implementation, training, and maintenance. Consolidating resources and directing
them toward a shared goal can help organizations achieve goals more quickly and at a lower cost
(Hanrahan, 2011).

As you review this report, the synergies in the results are interesting as each task group
completed their work with minimal input from other task groups. It is assuring that the
recommendations or opportunities align for the most part across the four groups.
Background

As EMR adoption has increased at the local PHU level, it has become increasingly important to explore how to optimize and integrate more fully with provincial health systems, local PHU systems and other important clinical systems. EMR interoperability; that being the automated seamless electronic exchange of information with other health care information systems, is a key requirement for the adoption of EMR system by PHUs.

It is of note that lessons of the past suggest that continued fragmentation of patient records is not in the best interest of the patient nor the health system in general. Interoperable solutions are a key aspect of ensuring the vision of “Patient First”.

Roughly half of all Ontario PHUs have adopted off the shelf EMRs, EMR-like systems or in-house developed solutions. PHUs implemented their EMRs for a variety of business needs including: realizing benefits of electronic charting and moving away from paper; having a comprehensive single record to track all PHU client interactions; address unmet functional requirements of provincial systems (e.g. OLIS integration) or a combination of any of these. These EMRs are being used to track both clinical client encounters (e.g. sexual health clinics) as well as non-clinical ones (e.g. tobacco cessation, pre-natal class registration).

### OntarioMD Certified EMR – 7 PHUs

<table>
<thead>
<tr>
<th>Organization</th>
<th>EMR Software Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northwestern Health Unit</td>
<td>XWave / QHR Accuro</td>
</tr>
<tr>
<td>City of Hamilton Public Health Services</td>
<td>OSCAR EMR</td>
</tr>
<tr>
<td>Kingston, Frontenac and Lennox &amp; Addington Health Unit</td>
<td>OSCAR EMR</td>
</tr>
<tr>
<td>Timiskaming Health Unit</td>
<td>OSCAR EMR</td>
</tr>
<tr>
<td>North Bay Parry Sound District Health Unit</td>
<td>PS Suite EMR</td>
</tr>
<tr>
<td>Wellington-Dufferin-Guelph Public Health</td>
<td>Excelicare</td>
</tr>
<tr>
<td>Region of Waterloo Public Health and Emergency Services</td>
<td>Nightingale OnDemand</td>
</tr>
</tbody>
</table>

### Use of Non-OntarioMD-Certified EMR – 7 PHUs

<table>
<thead>
<tr>
<th>Organization</th>
<th>EMR Software Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algoma Public Health</td>
<td>Profile</td>
</tr>
<tr>
<td>Durham Region Health Department</td>
<td>Profile</td>
</tr>
<tr>
<td>Brant County Health Unit</td>
<td>Profile</td>
</tr>
<tr>
<td>Niagara Region Public Health</td>
<td>Profile</td>
</tr>
<tr>
<td>Porcupine Health Unit</td>
<td>Profile</td>
</tr>
<tr>
<td>Toronto Public Health</td>
<td>TCHIS</td>
</tr>
<tr>
<td>Simcoe Muskoka District Health Unit</td>
<td>CHRIS</td>
</tr>
</tbody>
</table>
PHUs also use a number of provincially mandated public health information systems. These systems include the Integrated Public Health Information System (iPHIS) for communicable disease case/contact/outbreak management, Panorama and Digital Health Immunization Repository (DHIR) for immunization and inventory management and the Integrated Services for Children Information System (ISCIS) to track work related to the Healthy Babies/Health Children program. These non-connected public health IT systems require PHUs to collect and enter client/patient information into each system for the different services they receive. Without inter-operability across systems, PHUs are unable to have a holistic comprehensive view of the services their clients/patients received, creating inefficiencies and fragmentation that can negatively impact their health.

In Ontario, there is interoperability activity within the Connecting Ontario Hubs (Clinical Connect (cSWO), Connecting Ontario (cGTA, cNEO) whereby clinical data is being accessed via these clinical portals. There is opportunity for PHUs in each of these Hubs to gain access to clinical data to support our services initially with access to the clinical portals as well as to join discussions with these Hubs either directly or through LHIN involvement.

**Scope**

To better understand the local PHU EMR landscape and the impact current and future provincial health system initiatives could have on improving interoperability across systems, the following inform this report:

1. Surveys conducted with Ontario PHUs re lessons learned with current EMR implementation, and interoperability;
2. Gathering information from leaders at the Ministry of Health and Long Term Care (MOHLTC), eHealth Ontario on current and future provincial health system initiatives with an impact on local PHUs including Panorama and Connecting Ontario initiatives through the three hubs, cSWO, cNEO or cGTA noting that cNEO and cGTA are managed as one hub and the SWLHIN;
3. Conduct Key Informant Interviews with PHUs who had implemented EMRs, are accessing one of the Ontario clinical viewers (Clinical Connect (cSWO), Connecting Ontario (cGTA, cNEO)), funding opportunities and shared purchase service;

**Lessons Learned**

Candidate organizations were approached and asked to provide contact information for key informants (i.e., the individuals best able to answer questions about EMR deployment experience at the organization). Thirteen PHUs identified at least one key informant. One-on-one interviewing was used due to the ability to gather detailed information with interviews being conducted via the phone.
The objective of the one-on-one interviews were to:

- seek information on planning cycle including pre procurement and procurement;
- seek information on the implementation cycle;
- explore if an evaluation process was applied.

EMR Interoperability Survey

To examine the degree of local PHU EMR integration with provincial public health information systems, a survey with those PHUs with an EMR or EMR-like system. Note; an EMR-like system is best defined as a system that provides basic client management and some clinical aspects yet is not considered a mainstream EMR Vendor.

The objectives of the survey were to:

- determine how Ontario PHUs use their EMR system in conjunction with other local or provincially mandated information systems;
- determine the level of potential duplication across different information systems;
- determine the level of sharing of EMR data within and across PHUs.

While PHUs may have their own EMR specifically for tracking patients seen in their dental program, dental EMRs and interoperability with the Oral Health Information Support System (OHISS) was deemed to be out-of-scope for this report.

Shared Purchase Service

A combination of literature review and telephone interviews with six Shared Service Organization in Ontario and two Health Departments (Public Health Organizations) in US.

The objective of the one-on-one interviews was to:

- gain an understanding of how shared service is employed

Funding

Funding information was gleaned from discussion with OntarioMD and through consultation with healthcare organizations and meetings.

The objective of the discussions and meetings:

- to understand how shared purchased models are utilized and applicability to PHUs

Benefits and Challenges of Using an EMR Analysis

A survey to obtain a broad understanding of EMR systems currently in use in public health, as well as of the learning that could be shared. The survey was sent to 17 PHUs, with 13 PHUs responding for a response rate of 76%.
Requirements

To compile a standard set of baseline requirements to assist health units to develop and/or procure an EMR for clinical and/or non-clinical uses.

Method

The methods used by Task Groups for this report is a combination of literature review, telephone interviews, emails, group meetings and surveys with reminder phone calls to improve response rates for surveys. Clarification was sought when responses were unclear. The results of this collective form the content for this report.

Results

Lessons Learned

Major Themes

Project Management:

The project management team must be structured in a way that is both representative of everyone involved in the deployment effort and effective at making decisions and completing tasks in a timely manner. A single dedicated project lead with a full-time responsibility ensures that there is overall coordination and maintains forward momentum in all areas. A multidisciplinary team including business and technical representatives, as well as subject matter experts, maximizes organization and helps foster ongoing relationships. A shared work plan that includes all roles and responsibilities minimizes confusion and ensures that each member works as effectively as possible. It also enables sufficient resource allocation and allows a shared understanding of the work involved by both the project team and senior management. Finally, establishing a clear communication plan from the beginning supports effective and ongoing communication between and with stakeholders.

Ongoing Support for All Staff through the Learning and Maintenance Phases:

Staff buy-in is incredibly important as they are the users who will physically be inputting the data. If project management teams only rely on voluntary feedback, they may only hear from staff members who are comfortable with the technology. This group is likely unrepresentative of all the staff, and may not consider those who use technology less often. Teams must be prepared to support these staff members as they “catch up” to where they need to be. The project does not end with “going live” and this support cannot stop when the system is implemented. Without ongoing support for staff through both the implementation and maintenance phases, the project will fail.
Incremental Implementation:

Rollout must happen in phases in order to keep work manageable and limit the impact of glitches. Prioritized implementation allows issues to be fixed before teams shift their focus to the next phase. A clear timeline and workflow from the beginning ensures that the project moves along smoothly in a timely manner and that teams never lose sight of the ultimate goal of developing a system that works for the end user. In addition, it is important to ensure that the project team understands the system being implemented, particularly the back-end, as decisions at the start of the process will impact future implementation.

Customization will require Vendor and IT Support:

To be usable for public health units (PHUs), the EMR system will likely need to be customized for public health work. The system provided by the vendor is a base product, and the EMRs may require a large amount of customization, especially in regards to: privacy (access restrictions between programs), reporting capabilities, and data sharing mechanics (geography, sending data, provider as a PHU vs. provider as a physician). Interviewed organizations pointed out that lots of time can be wasted in this redevelopment because teams must try to retrofit something that was not originally designed to do what they needed it to do in the first place.

The initial tools/ templates provided by the vendor to describe required customizations and workflows generally do not work for PHUs. Therefore, the customization of the EMR system to public health requires the coding of new tools and templates. Interviewed organizations feel that tremendous IT resources are required to make such changes. In addition, teams will need ongoing support in terms of database changes and technical upgrades. This is an area that can be difficult to ask for from vendors and can dramatically increase costs of implementation. Chasing a vendor for support delays project implementation, causes loss of momentum, and ultimately costs valuable time and money.

Nevertheless, the time and resources that PHUS must dedicate to customization will prove to be worth it in the end, as developing one’s own system and structuring in advantages for one’s own users increases buy-in to the end-products. Therefore, it is important to have an ongoing plan for maintenance and support even after launch.

Minor Themes

Role of Front Line Staff during Implementation:

Involving administrative and front line staff in the design and testing phases is an effective way to increase buy-in and allow for feedback. In addition, it is a proactive approach for preparing for upgrades and making changes. It also helps in the development of workflows.
**Funding:**

The possibility of funding being limited is always a reality; for example, the Ministry of Health and Long-Term Care withheld providing one-time funding for EMR requests. Without consistent funding there is a risk for implementing from a narrow and silo perspective, rather than implementing the agency vision.

**Have a Good Understanding of the Ongoing or Hidden Costs:**

Some functionality additions may be expensive and there may be increased maintenance costs. Having unexpected costs may slow down development and implementation.

**Business Process Change Management:**

Change management strategies can be used to generate end-user buy-in. Engaged staff and a functioning system makes roll-out much easier, so it is important to communicate with staff and clients open and honestly. It is important to involve end-users via formal feedback and communication methods to help identify issues, needs, and gaps in planning. Without a tracking system of the complaints being made by staff and clients, organizations may have difficulty assessing the usefulness of the system.

**Data Migration:**

Data in raw-text format requires local IT work to write a script/ engine to import data. Inputting valuable data will make the EMR more informative; inputting historical data that is too old or unnecessary will just slow down the implementation process. Therefore, it is a good idea to archive data if it will not be valuable in the new system.

**Focused Themes**

**Collaboration**

Collaboration between PHUs is beneficial, as it may increase leverage for vendor developments. It has been demonstrated that an open source system facilitates such collaboration.

Partnership has occurred between health units on the same system as more experienced health units will sometimes share coding, forms, and knowledge. However, collaboration can be difficult because it elongates timelines and not all health units are at the same state of readiness. In addition, regardless of the system in use, the variation in business processes between health units ultimately leads to differences in functionality.

Health units have also benefitted from knowledge of other health organizations that are on a different system as their lessons learned are applicable to all health information technology projects.
Trade-Offs:

The most common trade-off identified by organizations was increasing complexity of EMR records management in order to meet their entire set of requirements. Needs and requirements were often identified in a vacuum and tailored to meet the current business processes. Organizations rarely considered revising business processes or reducing scope in order to simplify or reduce requirements and keep records management simpler. For example, organizations often accepted an increase in staff workload or a longer deployment timeline in order to manage staff buy-in, or meet a particular need or resource limit. Furthermore, increased maintenance cost has also been associated with either meeting needs or reducing initial costs. On the other hand, increased individual client functionality reflects a core challenge in the software market. The majority of software is designed for primary care (one-client, one-provider situations), and is not capable or not effective where the “client” is not an individual, as in public health practice. Again, needs and business processes must be examined to ensure that the trade-off is necessary.

Interoperability

How do local PHUs use their EMR in conjunction with provincial public health systems?

Fifteen of 17 (88%) PHUs responded to the survey. PHUs reported using their EMR and provincial systems for the most part in a complementary manner. PHUs reported that their EMR systems had the ability to capture more detailed client information and had more robust client/patient management functionality such as scheduling, booking appointments and electronic nursing notes that better supplemented their mandated provincial systems.

Thirty-three per cent (33%) of PHUs reported there was significant overlap in the types of data collected in iPHIS and their EMR, and, used iPHIS mainly to meet legislative requirements (i.e. reportable and communicable diseases reports). One PHU indicated they had to do this due to lack of resources to keep both systems current. Some PHUs felt that there was less overlap between their EMR and Panorama and that it had better tracking functionality than their EMR. When asked which system they kept more current and was therefore their source of truth for client information, 60% used their EMR over iPHIS compared to only 25% for Panorama (see Table 1). The one PHU who used their EMR over Panorama said this was due to data entry delays getting immunizations into Panorama. One PHU reported that for sexual health clinic clients they would start by entering clients into their EMR and only at the point that they became a case meeting the provincial case definition would they then enter them into iPHIS and use the case and contact management features. Two PHUs exclusively use Panorama to access client immunization details, and only use their EMR system for tracking other information (e.g., client visit details)
Table 1: Data Handling Practises - EMR and Provincial Information System (n=15)

<table>
<thead>
<tr>
<th>Description</th>
<th>iPHIS # (%)</th>
<th>Panorama # (%)</th>
<th>ISCIS # (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHUs who duplicate data in EMR/provincial system</td>
<td>9 (60%)</td>
<td>8 (53%)</td>
<td>4 (26%)</td>
</tr>
<tr>
<td>PHUs where EMR/provincial system synchronized with same information at all times</td>
<td>4 (44%)</td>
<td>4 (50%)</td>
<td>2 (50%)</td>
</tr>
<tr>
<td>PHUs entering <strong>minimal information</strong> into provincial system to meet provincial reporting requirements</td>
<td>3 (33%)</td>
<td>NA</td>
<td>1 (25%)</td>
</tr>
<tr>
<td>When data is not synchronized, <strong>EMR</strong> has most current data</td>
<td>3 (60%)</td>
<td>1 (25%)</td>
<td>2 (50%)</td>
</tr>
<tr>
<td>When data is not synchronized, <strong>provincial system</strong> has the most current data</td>
<td>2 (40%)</td>
<td>3 (75%)</td>
<td>2 (50%)</td>
</tr>
</tbody>
</table>

Source: COMOH Interoperability Survey June 29 2016.

**How much duplication of data exists in EMRs versus provincial public health systems?**

All 15 PHUs reported that some of the same data co-exists in the provincial systems they use and their EMR. They reported using only manual or semi-automatic re-entry processes to move data from their EMR systems into provincial systems and vice versa (Figure 1). Note: with the current implementation of PHIX (Release 2) and ICON this may change as it provides more capability for moving data from an EMR to Panorama.

**Figure 1. Summary of PHUs who reported re-entry of data from their local EMR to other provincial systems**

* Some EMRs overlap with more than one system.

Source: COMOH Interoperability Survey June 29 2016.
Data duplication in EMR with iPHIS

Nine (60%) PHUs reported that some of the data stored in their EMR were duplicated in iPHIS. The types of duplicated data included demographics, case/contact management and treatment, test results, sexual health information, risk factors, nursing notes and immunization information (see Figure 2).

Figure 2. Types of duplicated data in iPHIS and EMR systems used by PHUs

Source: COMOH Interoperability Survey June 29 2016.

Data Duplication with Panorama's Immunization Module

Eight (53%) PHUs reported that some of the data in their EMR systems were duplicated in the Panorama Immunization module. The types of duplicated data included demographics, immunization/vaccine information and adverse events. Some PHUs reported that they are piloting the Public Health Immunization Exchange (PHIX) application with Panorama which allows for semi-automated uploads into the Panorama system following a validation step.

Data Duplication with ISCIS

Four (26%) PHUs reported that some data in their EMR system were duplicated in ISCIS. The types of duplicated data included scheduling, demographics and client interactions.

EMR Interoperability with External Organizations with Other EMR Systems

When asked if the PHU EMR was connected to external partner's EMR, 14 (93%) PHUs reported that their EMR is not connected to any other EMR outside of their PHU. One PHU reported that they use EPIC for physician/nurse practitioner access to their EMR. A second PHU is in the process of creating a module to share child health data for inter-agency data sharing.

Discussion

The survey revealed that there is currently no interoperability between provincial information systems and the various EMR systems used by the 15 PHUs who took part in the survey. Many PHUs reported that their EMR system often contained a more comprehensive and up to date history of the patient's health record. PHUs reported that for specific activities such as managing sexual health clinic clients they often re-entered portions of the record from their EMR system into provincial systems and did so primarily to meet mandatory legislative requirements. A few
PHUs reported only limited additional benefits of having the same data in both their EMR and provincial system. While one PHU cited delays in data entry into Panorama, it should be noted that newly developed tools being released to PHUs including PHIX (Release 2) and Immunization Connect Ontario (ICON) could significantly reduce such delays by providing more capability for moving data from EMRs to Panorama.

None of the various EMRs used by PHUs were interoperable with each other and only one PHU had a connection to another health care provider's EMR to facilitate data sharing. However, even this connection wouldn't be considered interoperable.

The survey results also appear to demonstrate a lack of consistency in how PHUs use their EMR system in conjunction with provincial systems. The type of information entered into the provincial system versus their EMR varied greatly by PHU which could potentially result in inconsistent public health records. For instance, one PHU reported only keeping client records of administered publicly funded vaccines/Immunization of School Pupils Act (ISPA) vaccines in Panorama and vaccines administered at their travel clinic in their EMR only.

An unintended consequence of a local PHU EMR implementation is the creation of fragmented public health record where some information is stored in the local EMR and some in the provincial public health system. Even more troublesome is that since this data is not available across public health, a patient's data is being further fragmented – a problem that was highlighted once patient records were amalgamated into Panorama. These isolated public health records have the potential to impact continuity of care and clinical decision making as information about the patient may not follow them from one PHU to the next if they move unless other processes are in place.

This also creates inefficiencies, confusion and potential costly duplication of information as health unit staff manually re-entry the same information into multiple systems. This practice could result in information silos and limit the value of any form of sharing public health data with the broader health care community including the planned province-wide immunization registry. iPHIS and Panorama are two successful province-wide data repositories designed specifically for local public health and available at no-cost to the PHU. Use of these systems as primary tools for documenting client interactions would minimize the creation of fragmented public health records. A few PHUs responded that they used their EMR for nursing notes because iPHIS notes are not compliant with College of Nurses Ontario documentation standards. In fact, both iPHIS and Panorama notes functionality do meet the standards and many PHUs do currently chart electronically in both systems (Source: Informal Survey by Toronto Public Health to iPHIS users, February 2016).

Limitations of the Survey Data

Limitations of the survey include its relatively small sample size even though there was a high response rate. Two of 17 PHUs with EMRs did not complete the survey and some questions had very few responses making it difficult to establish any type of trends especially with ISCIS data. While questions were asked about the fields being duplicated between EMRs and provincial systems, respondents were not asked to describe the specific types of records being duplicated (e.g. clinic records, disease records) nor the number of records this involved. Therefore, results
related to data duplication across systems must be interpreted with caution. Regardless, the survey findings clearly indicate that data duplication and fragmentation are occurring.

Appendix C: Survey Questions

Current and Future State of EMR Interoperability with Provincial Public Health Systems

Panorama and EMR Integration

The potential for EMR integration has been demonstrated in Panorama with the recent implementation of PHIX. PHIX acts as a “gateway” to allow PHUs to transfer structured immunization data from external sources such as online immunization reporting portals or physician-based EMR systems extracts through bulk file uploads into Panorama. PHIX eliminates the need to manually re-enter immunization data from these other systems and enables timely recording of immunization data into the planned provincial Digital Health Immunization Repository (DHIR). Recently PHIX Release 2.0 provided additional features including data fields that will make EMR integration easier. Additionally, PHIX now supports integration with the ICON (Immunization Connect Ontario Web Application – currently in limited release) through HL7-FHIR standards and available to EMR vendors in 2017.

The province is already making significant steps toward EMR integration with Ontario's Immunization solution. There are a number of pilots between PHUs with EMR systems to move data seamlessly to Panorama eliminating the need for manual re-keying of data. There is also a pilot with at least one Family Health Team to integrate FHT EMR data with Panorama. Furthermore, the province is working to make Panorama’s immunization data available to clinicians via their regional clinical viewer to assist in clinical decision making.

Panorama’s Immunization module is implemented in 36 PHUs and is a key asset in the province's overall Immunization Ontario Solution (ION) and the Immunization 2020 Strategy. The MOHLTC is implementing a number of tools, frameworks and platforms to enable interoperability with the broader health system. ION will enable interoperability between the Immunization Repository and Drug Repositories and various health systems including provincial systems, hospital information systems (HIS), pharmacy management systems (PMS), EMRs, personal health records (PHR) and mobile solutions. Other examples of tools being developed by the MOHLTC enabling inter-operability or the sharing of health data with the broader health system include:

- The DHDR (Drug Repository) is currently in a limited production release with a number of institutions in the Guelph area and will be broadly available in 2017. The ICON web application is being developed for physicians to view and submit immunizations to public health, similar to ICON for parents. This is targeted for spring/summer 2017.

- The ICON (Parent Immunization Submission and Yellow Card Retrieval) web application is currently in limited production release with a number of Public Health Units and will be broadly available in 2017.
• The DHIR (Immunization Repository) provides extensions to Panorama to enable interoperability to external systems and provides the services for ICON, m-IMMS and future EMR interoperability.

• The PEAR (Panorama Enhanced Analytics and Reporting) tool is currently available to PHUs with abilities to extract information for use with PHU local EMR solutions.

• The m-IMMS Mobile Application Solution is currently being rolled out providing Public Health Units with a mobile application for mass immunization clinics.

eHealth’s ConnectingOntario Initiative

The potential to link both community-based physician and local PHU EMR system data together may be enabled through eHealth’s Ontario’s ConnectingOntario. ConnectingOntario currently has three regional initiatives underway: Connecting South West Ontario (cSWO); Connecting Greater Toronto Area (cGTA); and Connecting Northern and Eastern Ontario (cNEO). cGTA and cNEO utilize a common viewer to access the provincial Clinical Data Repository while cSWO has deployed the Regional Clinical Viewer, ClinicalConnect™. Each hub has their own governance structure, leadership and project management. Regardless which clinical viewer is used to access the health information, the goal of ConnectingOntario is that an integrated electronic health record (EHR) is accessible by all healthcare providers province-wide. These initiatives are already enabling secure web-based access to electronic health records for health care providers from a variety of sites including acute care, community care access centres, regional cancer programs and include gateways to other provincial systems including the Ontario Laboratory Information System (OLIS) and Diagnostic Imaging (DI) Common Service solution. Health care organizations and providers can contribute health data from their information systems and view regional patient health care information. Connecting Ontario provides many benefits to the patient, healthcare provider and the healthcare organization as outlined in Table 2. A recent prototype demonstrated the integration of the Ontario Immunization Repository with the cSWO Clinical Viewer to display immunization history and forecasts. While contribution of data from health care organizations and providers is currently limited to Hospitals, prototypes are underway to determine how primary care EMRs can contribute to this effort. ConnectingOntario, through the three hubs (cSWO, cGTA, cNEO), provides many benefits to the patient, healthcare provider and the healthcare organization as outlined in Table 2.

Table 2. Benefits of ConnectingOntario

<table>
<thead>
<tr>
<th>Patient</th>
<th>Provider</th>
<th>Organization</th>
</tr>
</thead>
</table>
| Improves the patient experience by:  
  • Enabling faster care decisions  
  • Decreasing the need for patients to repeat their health information  
  • Reducing the need for duplicate testing/procedures  
  • Reducing inconvenience, travel time, discomfort  
  • Reducing exposure to diagnostic imaging radiation | Enables faster and more informed clinical decision-making by:  
  • Reducing calls to locate hospital records, discharge summaries, lab results  
  • Enabling faster, more informed decisions  
  • Enhancing communication and collaboration  
  • Creating more complete view of | Increases organizational efficiencies by:  
  • Enabling faster care decisions  
  • Reducing redundancies  
  • Improving resource allocation as providers’ and support staff’s time is freed from administrative tasks  
  • Decreasing administrative costs |

Page 19
• Helping decrease re-admissions
• Improving transitions across continuum of care

patient with data from multiple sources
• Reducing miscommunication with access to real-time electronic information


Electronic access to leverage electronic patient information creates a more complete view of a patient with data from multiple sources. The provincial Clinical Data Repository (CDR) contains a multitude of health information from various sources and is currently available via cGTA and cNEO as outlined in Table 3. cSWO has access to similar information via Clinical Connect and will shortly be contributing to the Provincial CDR. cSWO has more than 41,000 registered users who have access to information via its ClinicalConnect viewer from all 67 acute care hospital sites, all four CCACs, all four regional cancer care programs, Southwestern Ontario Diagnostic Imaging Network (SWODIN) and OLIS. cGTA has more roughly 42,000 registered users across 49 sites viewing data in the CDR (date on cNEO not available). (Source: Connecting Ontario presentation to the COMOH Working Group on May 25, 2016). Note: Future PHU EMRs should have capability to contribute to the CDR.

Table 3. Health information currently available in the Provincial Clinical Data Repository

| Acute Care | • Patient demographics | • Cardiovascular reports |
| • Discharge summaries | • Consultation reports |
| • Allergy information | • DI reports |
| • Infection control information | • ED reports |
| • Medication profile | • Neurophysiology reports |
| • Visit/encounter details | • Respiratory reports |
| • Mental health assessments | • OR reports |
| CCAC | • Long term care home details | • Client risk |
| • Service details | • Assessments |
| Acute Care and CCAC | • Consent directives | • Laboratory test orders and results |
| • Override rules | OLIS | 

Source: Connecting Ontario presentation to the COMOH Working Group on May 25, 2016

Ontario Public Health Unit Participation in Connecting Ontario

In summer 2016, key informant interviews were conducted with the four Ontario PHUs who have access to one of the Connecting Ontario hubs (see Table 4 and Appendix B). At this time, access is view-only and PHUs are not contributing public health data to a clinical data repository (excepting Panorama/DHIR is a data repository). Note: Clinical viewers are geared to view only and do not participate in populating the CDR or HIS systems. The ClinicalConnect viewer does depend on the CDR it reaches out to HI systems directly, decentralized model.

PHUs cited various benefits including:
• Accessing diagnostics for case management (e.g., chest x-rays for Tuberculosis cases)
• Reviewing critical lab and microbiology reports relevant to public health cases
• Accessing hospital discharge summary reports
Table 4: Ontario Public Health Unit Participating in ConnectingOntario

<table>
<thead>
<tr>
<th>Health Unit</th>
<th>Ontario Connect Hub</th>
<th>Implementation Date</th>
<th># of Users</th>
<th>Program</th>
<th>Type of Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peel Region</td>
<td>cGTA</td>
<td>2016</td>
<td>100</td>
<td>CD</td>
<td>• OLIS, hospital discharge summaries, after-hours</td>
</tr>
<tr>
<td>Waterloo Region</td>
<td>cSWO</td>
<td>2015</td>
<td>30-40</td>
<td>ID, TB, STI, BBD</td>
<td>• OLIS, diagnostics, radiology (TB), consult notes and discharge summaries, pharmacy</td>
</tr>
<tr>
<td>Niagara Region</td>
<td>cSWO</td>
<td>2016</td>
<td>10</td>
<td>ID, TB, SHC, Community</td>
<td>• OLIS, diagnostic imaging, medication modules, hospital records, mental health</td>
</tr>
<tr>
<td>Wellington-Dufferin-Guelph</td>
<td>cSWO</td>
<td>2015</td>
<td>&lt; 20</td>
<td>ID, TB, CD, STI</td>
<td>• OLIS, diagnostics, radiology (TB), consult notes and discharge summaries, pharmacy</td>
</tr>
</tbody>
</table>

Source: Phone interviews conducted by Jacqui Tam, summer 2016.

Along with these Public Health Units who are currently using one of the two clinical viewers, the following from cSWO have signed Data Sharing Agreements (DSA) and are in the on-boarding process:

- Windsor-Essex County Board of Health
- County of Oxford Public Health Unit
- Elgin St. Thomas Health Unit

Conclusions

PHUs are increasingly adopting EMR systems to manage electronic client records. There is currently a disconnect both from a technical perspective and a business operations perspective as to how EMR systems should be used within the context of legislative requirements with regard to provincial public health systems. Until such time as tools are developed to enable interoperability between various systems, PHUs who are considering adopting an EMR solution need to factor in the costs associated with mostly manual and semi-automatic methods of moving data from their EMR to provincial systems. While TG5 did not quantify these costs, depending on how the EMR is deployed across various public health program areas these costs could be very high.

EMR data collected at the local PHU level is valuable health information that should be part of the patient's overall EHR. Ontario should have both the technical platforms and the legislative infrastructure in place to enable EMR inter-operability of public health IT solutions. Lessons of the past strongly suggest that continued fragmentation of patient records and lack of data standards to enable data sharing is not in the best interest of the patient nor the health system in general. Interoperable solutions are a key aspect of ensuring the vision of “Patients First”.

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Shared Purchase Service

Procurement professionals working in the industry today highly recommend leveraging the combined purchasing power of the group procurement for PHUs to procure an EMR. Group purchasing enables organizations to share ideas and resources in the planning and procurement stages, and shows vendors the potential for a larger agreement. Reflecting committed organizations in the competitive documents demonstrates buy-in for vendors, who can in turn tailor their responses to suit the multi-site issues required by PHUs. In turn, PHUs could help each other develop requirements and specifications they may not have considered on their own (N. St-Maurice, personal communication, June 3, 2016).

Ontario has 9 Shared Service Organizations (SSOs), formed by the Broader Public Sector Supply Chain Secretariat. These SSOs are mandated to provide supply chain services to member healthcare organizations, with the objective to improve service levels, maximize efficiencies, and generate savings that can be reinvested. For this report, phone interviews were performed with the following six SSOs: Appendix G: Shared Service Organization/Services

- Shared Support Services Southeastern Ontario (3SO)
- Mohawk Shared Services
- Shared Services West (SSW)
- Healthcare Materials Management Services (HMMS)
- TransForm SSO
- Champlain Health Supply Services

These SSOs provided insights to inform the EMR Working Group. Shared services/procurement allows organizations to share support services, centralize data centers, virtualize servers, and upgrade systems more efficiently.

The following outline benefits of a shared purchase model, in this case for an EMR, and key considerations:

**Comprehensive Planning**

Planning meeting schedules, timelines, and contingencies prior to the implementation ensures that the project runs more smoothly. Including stakeholders and participating organizations in the planning phase secures buy-in throughout the project. Particularly for multi-site procurements, it is important to understand the shared requirements for the procured product.

Competing interests and needs can steer the project off course. In order to keep scope manageable, it is critical to stick to the plan and deliverables. Where possible, maintaining the same team members and participants throughout the entire process is key. If there are member replacements and new additions to the project, it will be important to ensure that these new members are well informed of the project.

Empowering organizations to participate in the competitive process helps those organizations plan for their future.
Willingness to Participate

Organizations must be willing to participate in the collaborative purchasing model. Agreeing to participate in a collaborative purchase model requires stakeholder buy-in, making changes and transforming in some cases. Participating organizations are offered the option to join the competitive process. A standard form can be distributed with the high-level scope of the project and the requirements for participation (e.g. budget allocation, evaluation resources, and resources to participate in the project). When organizations agree with the approach, an agreement is signed, where members are bound to the terms of the agreement and will see the project through to the end.

Evaluation Team

Evaluation teams are necessary and are formed in order to determine how competitive documents will be scored based on organizational requirements. Team members should come from the member organizations and have expert knowledge and experience related to the procurement. The evaluation team should include administrative, clinical skills, and technical skills to understand the EMR landscape and required functionalities and features. Including end-users in the procurement process ensures that the needs of the individuals who will be using the system daily are met, which in turn secures buy-in once a system is selected. Attempts should be made to keep the evaluation team small, as larger groups can have more trouble reaching consensus.

Team members should have strong communication skills, be able to commit time to the project, and be able and willing to participate in ongoing meetings and training. Formalizing a meeting schedule for the entire length of the process can help team members schedule their time in advance. Evaluation team members should be made aware of the approximate length of time and workload required to participate, as commitment from all members is a critical component of success during the procurement process to ensure deadlines are met.

Detailed Scope and Specifications Document (RFP)

The scope and detailed specifications document including mandatory attributes outlines all the requirements of the member organizations for the system being purchased. Consensus for the scope and requirements included in the Request for Proposal (RFP) is a key factor in the process. The timeline for implementation will be included in the RFP along with identification of organizations who will implement at what stage in the process. Also included in this document are budget capacity and evaluation criteria. Evaluation criteria will be used to score tenders and should therefore cover a broad range of specifications and requirements. Criteria can be divided into financial and non-financial criteria.
Broader Public Sector Directive

The purpose of the BPS Directive is to:

- Ensure that publicly funded goods and services are acquired by BPS organizations through a process that is open, fair, and transparent;
- Outlines responsibilities of BPS organizations throughout each stage of the procurement process; and
- Ensure that procurement processes are managed consistently through the BPS.

The five principles of the BPS Directive:

1. Accountability
2. Transparency
3. Value for Money
4. Quality Service Indicators
5. Process Standardization

Although public health units (Boards of Health) are not governed under this directive, the principles can be applied to any public sector procurements. The competitive document (RFP) is publically posted to allow for fair and transparent process, and vendors are given time for questions before responses are due. Once submissions dates have closed, the evaluation team must sign a Confidentiality Agreement (CA) or a Non-Disclosure Agreement (NDA) before tenders are released for evaluation.

Thorough Evaluation

Scoring must be consistent across team members. If another evaluator is required to take over the evaluation of tenders, they may score differently than the original evaluator. It is also important to note that evaluation criteria and scoring methods must be disclosed in the competitive (RFP) document. Vendors need to be made aware of how they are being scored in order to keep the process fair and transparent.

If mandatory specifications have not been addressed in the vendor responses, the responses are not considered. The initial scoring occurs for the non-financial criteria. Each evaluator reviews and scores every vendor response. The scores are then averaged across the evaluation team members at the same site. If anomalies or outliers exist in scoring, it is beneficial to investigate why that evaluator scored differently from the rest of the team at a particular organization. Once the discrepancies are clarified and scoring is agreed upon, the top 2-4 responses are selected.

The selected vendor responses are then scored on financial criteria in the second round. This allows the evaluation team to score the non-financial criteria first, without being skewed by the costs. Once a vendor has been selected, a document with a description of the procurement process, including number of responses for each stage of scoring, financial information, and reasons for award, is developed. The goal at this stage is to work toward an award of contract, as the award is not granted until the agreement is signed with the vendor.
Transparent Contract Award

Once a final selection has been made and an executive summary has been released to the winning vendor, an agreement is developed, finalized, and signed. The contract award should be posted publically. The term of the agreement and the extension periods should be carefully considered, based on the product or services being purchased. If member organizations cannot agree on all terms, variance schedules may be used to accommodate differences, i.e. one organization will implement Component A initially and the other two will implement Component A at the six month mark. The term of the agreement and the extension periods should be carefully considered, based on the product or services being purchased.

Workflow Mapping

Workflow mapping is a critical component, participate in the process and give feedback, they are more likely to have a system they can actually work with in the future and share across multiple organizations with similar workflows and processes, particularly for multi-site implementations. If one organization out of a group has a different workflow, that organization may require a modification to their installation of the system; does this modification get installed at all sites? If organizations all.

EMR-Specific Considerations

Larger, hospital-centered EMRs have more robust surveillance, outbreak, and case management capabilities. Available vendors with these systems implemented in Canada include Cerner, Epic, Meditech and QuadraMed. This scenario speaks to the first option in partnering. Local Health Departments (LHDs) in the United States recommend cloud or Software as a Service EMRs, for data storage as they enable more data sharing and BI capabilities across multi-site, healthcare organizations. Kansas City, Missouri’s LHD partnered with Cerner in the early 2000s to develop HealthSentry, a beta system for laboratory and disease reporting which pulled data from organizations using the Cerner EMR and generated reports and alerts when a suspected outbreak was detected. Though this system is no longer supported, Cerner has moved on to develop another platform for population health management in public health, HealtheIntent™ Population Health Management Platform.

HealtheIntent™ Population Health Management Platform (Cerner)

Cerner’s Population Health Management platform is focused on three main concepts: Know, Engage, and Manage. Organizations must know and predict what will happen within their population, engage members and care providers to take action, and manage outcomes to improve health and care for those populations and individuals. The HealtheIntent™ platform is Cerner’s vision for a comprehensive population management system. HealtheIntent™ is cloud-based, and designed to be scalable at a population level while facilitating health and care at a person and provider level (Cerner, 2016). It enables organizations to aggregate, transform, and reconcile data across the continuum of care. HealtheIntent™ is able to receive data from any EHR or existing HIT system, as well as other data sources, such as pharmacy or insurance. Collecting data from multiple disparate sources provides clarity to providers and allows them to
identify, score, and predict the risks of individual patients. Those patients can then be matched to the right care programs. HealtheRecord™ is an EHR built on the HealtheIntent™ platform. It allows for data aggregation across multiple clinical sources, and the creation of a consolidated record at the client level. This EHR creates the foundation for population-based reporting. HealtheCare™ is a solution that facilitates transitions of care through the exchange of pertinent information and care planning across the continuum of care to achieve optimal health state, quality and costs. Some of the major features of this system include:

- Configurable algorithms identify, stratify, and prioritize individuals for assignment to aligned care managers
- Holistic views of individuals allow users to make informed decision regarding interventions and care
- Task management capabilities enable the care management workforce to help manage daily activities for an assigned population
- Templates to document assessments, action plan and goals, and care team interactions
- Outreach capabilities allow care managers to generate service letters
- Care manager summaries provide visibility to work statuses of assigned populations and help balance resource allocation and performance
- Ad-hoc report queries and the ability to build custom reports allow organizations to analyze data (Cerner, 2016)

The strength of this type of system is in robust data analysis, surveillance, and case management capabilities. Cerner’s HealtheIntent™ is one example of the types of system that would better facilitate data sharing and collaboration across multiple PHUs in support of the second COMOH key objective, to provide recommendations for data sharing and access between public health units.

The systems mentioned here do not negate what has already implemented by roughly have of the PHUs in Ontario but provides the opportunity to consider other systems or combinations of systems. As an aside, an ASP model for PHUs should be a consideration as PHUs move forward.

EMR Procurement and Implementation

In going with a shared purchase model for EMR procurement, it is highly recommended that the project lead for the procurement and implementation be hired externally and work with internal and external stakeholders. Prior to beginning the competitive procurement process, the project lead would work with the partner organizations to identify any internal staff that could be members of the procurement and implementation team as well as identify any additional external resources that may be required.

Once the team is formed, the team should complete the following tasks for procurement to ensure that key requirements and specifications are understood prior to engaging with the vendor community:

1. Assess organizational readiness.
2. Assess organizational financial resources.
3. Create a budget.
4. Create a communication plan.
5. Identify key requirements and specifications
6. Develop a data conversion and chart migration plan.
7. Conduct workflow analysis and process redesign.

**Procurement and Implementation Team Roles**

<table>
<thead>
<tr>
<th>Role</th>
<th>Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Director</strong></td>
<td>• Works with lead PHU(s) &lt;br&gt; • Responsible for and plans, organizes and manages the procurement and implementation process &lt;br&gt; • Ensures that the procurement process is in adherence to governance standards, organisational requirements, and market trends &lt;br&gt; • Leads the develop the scope and specifications document, in conjunction with project manager, stakeholders, and project team members &lt;br&gt; • Provides project procurement reports as necessary &lt;br&gt; • Negotiates with external vendors to secure the most advantageous terms &lt;br&gt; • Works closely with management of member organizations to ensure that scope and direction of project is on schedule &lt;br&gt; • Leads and coordinates the implementation of the selected approach and/or vendor</td>
</tr>
<tr>
<td><strong>Project Manager</strong></td>
<td>• Supports and works with the Project Director &lt;br&gt; • Develop the scope and specifications document and implementation plan in conjunction with project team and stakeholders &lt;br&gt; • Provides status reports &lt;br&gt; • Works with member organizations to ensure scope and direction of project is on schedule &lt;br&gt; • Assigns tasks to team members based on project needs and team member roles</td>
</tr>
<tr>
<td><strong>Project Coordinator</strong></td>
<td>• Supports project lead and team by building networks of cooperation through each organization and ensuring that stakeholder needs are addressed and met throughout the procurement and implementation phases &lt;br&gt; • Communicates regularly and often with team members in order to keep project moving forward according to the schedule &lt;br&gt; • Completes documents, reports, attends meetings recording deliverables and timelines</td>
</tr>
<tr>
<td><strong>Change Management/Transformation Manager</strong></td>
<td>• Supports and works with the Project Director &lt;br&gt; • Develop structured change management strategy and plans by working with stakeholders and member organizations to determine specific needs &lt;br&gt; • Support individuals and team working at the organizational level to understand what they need from the project &lt;br&gt; • Supports implementation by developing a plan with stakeholders and assists in auctioning the plan</td>
</tr>
<tr>
<td><strong>Procurement Manager</strong></td>
<td>• Supports and works with the Project Director &lt;br&gt; • Builds relationships with key stakeholders and employees to ensure that transformative work is accepted and effective &lt;br&gt; • Understands and applies procurement directives and guidelines to the work of the procurement team &lt;br&gt; • Acts as point of contact for vendors and tender inquiries</td>
</tr>
<tr>
<td><strong>Contract Manager</strong></td>
<td>• Supports and works with the Project Director &lt;br&gt; • Manages confidentiality agreements/NDAs for the evaluation team &lt;br&gt; • Works with procurement team to develop competitive document/RFP &lt;br&gt; • Responds to vendor inquiries</td>
</tr>
</tbody>
</table>
Communicates with vendors to coordinate site visits, demonstrations, etc.
- Develop final contract award document in conjunction with other team members
- Understands legal and financial requirements and applies them to project documentation
- Manages any ongoing contract

| Stakeholder Engagement Manager | Supports and works with the Project Director
|                               | Works with stakeholders to develop specifications and requirements
|                               | Advocates for stakeholders during the procurement process to ensure needs are met

| Technical Manager              | Supports and works with the Project Director
|                               | Work with stakeholders to develop technical requirements and specifications for procurement process
|                               | Supports decision-making at the evaluation phase by contributing technical knowledge to meeting of stakeholder specifications
|                               | Work with the stakeholders and vendor during implementation

Funding

Early on, the task group found no funding available for primary care EMRs certified for use by OntarioMD. During meetings with other task groups, the possibility to leverage funding through hospitals with a shared purchase model was addressed. The Hospital Information System Renewal Advisory Panel worked to develop recommendations to the Ministry of Health and Long-Term Care which align the value of Hospital Information Systems to Patients First: Action Plan for Healthcare. This panel found that the first generation of HIS investments, while having delivered local value and benefits, have resulted in duplication of effort and a loss of standardization opportunities across hospitals in Ontario. Looking forward, the panel recommends building on existing relationships to move onto shared HIS instances and services, and increasingly driven by evidence of benefits in improved quality of care and health system integration. Public health can leverage the opportunity to participate in these types of partnerships with the potential to secure funding. The panel will continue to explore how the Health Based-Allocation Model (HBAM) and other funding models can support the adoption of evidence-informed practices related to HIS investments and partnerships with public health units across Ontario.

Leveraging existing larger more robust EMR systems with greater functionality, such as case management and data warehousing for analysis and planning, would benefit PHUs. Partnering with a hospital (or group of hospitals) could provide a foundation for data sharing and surveillance components in the selected EMR with the opportunity for a Business Intelligence system to be a component of a more robust system. It is further recognized that in creating such access will require agreements to be utilized for data sharing, potential for legislation to be modified to accommodate this concept and most importantly collaboration among all parties that would be developed.

The Ministry of Health and Long-Term Care is also taking action to develop a province-wide strategy to improve the delivery of supply chain management across the healthcare sector through the Healthcare Sector Supply Chain Strategy. This strategy is being developed to support Patients First: Action Plan for Healthcare, as well as a recommendation from the Ontario Health Innovation Council report to shift to strategic value-based procurement.
Benefits and Challenges of Using an EMR

Key Findings

- PHUs in Ontario are currently using smaller, primary care-centered systems that lack the capacity to perform robust data analysis and case management.
- PHUs have focused their EMR implementation primarily on sexual health, vaccine-preventable disease, dental, and family health programs.
- All PHUs reported the ability to back up data (on- and/or off-site).
- All PHUs are able to store their data within Canada.
- Open-source systems, such as OSCAR, do not require license purchases, but can require more technical resources, e.g. hiring of developers, purchase of hardware, etc. Open-source systems also typically do not include training for the users.
- PHUs reported that project planning and training costs were absorbed into staff time, and did not add cost to the implementations.
- 6 PHUs migrated archival data and/or data from another system. Cost for this depended on the amount of data required to be migrated. PHUs used in house staff time, hired external developers, or negotiated this activity into their contract with the EMR vendor.
- PHUs have reported that there is more space in office due to reduction of paper filing cabinets and reuse of filing rooms for other purposes.
- PHUs have not tracked if a cost savings has been seen due to the reduction of transcription, prevention of adverse drug events, and avoiding downloading laboratory results.
- In keeping with the provincial directive to move to digital, PHUs could align in ConnectingOntario hubs to access the provincial Clinical Data Repository (CDR) with a larger, more robust EMR.

Appendix D: Benefits and Challenges of Using an EMR Results per Question

Requirements

A standard set of baseline requirements was compiled to assist health unit's to develop and/or procure an EMR for clinical and/or non-clinical uses. A request for information was sent in March 2016 through the ALPHA network to organizations who had already implemented an EMR in their organization.

Responses were first reviewed to identify duplicate requirements. A consolidated list of requirements was then generalized for use as a baseline to develop more detailed requirements. Requirements were categorized and defined as either functional or non-functional. Toronto Public Health also contributed their non-clinical requirements summary.
For the purposes of this exercise a functional requirement describes the behaviour of a solution and how that solution will manage information, and a non-functional requirement describes conditions under which a solution must remain effective or qualities that a solution must have. A clinical requirement relates to client or group services in a clinic environment where the client or group come to receive services and a non-clinical requirement relates to client or group services not in a clinic environment where the provider of services comes to the client or group to give services.

Information was compiled and validated by the task group to confirm that the groupings were correct and the requirements were specific enough to create a good baseline for health units to move forward with more detailed requirements. Suggested categorization of baseline requirements as either mandatory (M) or rated (R) are provided. However, due to variances in need and procurement practices between organizations, it is recommended that health units consult with local procurement specialists when preparing documentation for Request for Proposal.

The resulting summary of business requirements can be found in Appendix H

Recommendations

Interoperability

The lack of interoperability between local PHU EMR systems and provincial systems impact continuity of care, clinical decision-making and potentially the loss of access to health information as patients move from different health jurisdictions. Based on the review of current provincial systems and the findings of how EMRs are used by PHUs across Ontario, the following recommendations are proposed:

6. The COMOH EMR Working Group request the Chief Medical Officer of Health of Ontario to:

   a. accelerate work to ensure Panorama's immunization module is inter-operable with both PHU and physician-based EMR systems;
      i. For PHU EMR procurements, require that EMR’s adopt the provincial DHIR:HL7-FHIR Standard that provide interoperability capabilities between PHU’s to ensure sharing of EMR specific data using a similar CDR mechanism as used by Hospitals and/or directly with Ontario CDR
      ii. Request that MOHLTC work to provide a consistent shared patient/client view across multiple provincial systems including Panorama, iPHIS and ISCIS and integration with Provincial Client Registry (EMPI)

   b. begin work to ensure iPHIS, ISCIS and other key provincial public health information systems are inter-operable with PHU EMR systems by;
      i. Implementing better OLIS integration with iPHIS.
ii. Sharing and synchronizing Client Demographic information by leveraging the provincial client registry.

c. develop standard and operating procedures to ensure consistent usage of provincial information systems and local EMR in alignment with provincial initiative including "Immunization 2020" and "Patient's First'';

d. update the Ontario Public Health Standards, Immunization Protocol to use Panorama as the immunization repository for all immunizations for all ages.

7. That all Ontario PHUs obtain access to clinical viewers used in the Connecting Ontario Hubs. Appendix E

8. That PHUs select no more than 2, but preferably one standard EMR vendor for PHUs and encourage PHUs to migrate to this standard, timing to be determined. That this EMR Vendor provide inter-PHU capabilities and integration with:
   a. The Ontario Immunization Repository
   b. The Provincial Client Registry
   c. The Provincial Provider Registry
   d. The Provincial Authentication Mechanism
   e. The Ontario Provincial Laboratory Information System (OLIS)

Lessons Learned

1. Project Management

Use project management methodology with a project leader who is supported by a steering committee or project management team. Choose representatives for the project management team who have different skill sets and/ or represent different groups of end-users. IT is an essential member of the team.

Establish project charters early on to ensure common understanding of scope and deliverables. Project charters should be used to define the scope of the project, how the project is being rolled out, the roles and responsibilities of the project team and staff, and the limits to roll-out. It is especially important the project lead prioritizes this project and does not get distracted by other responsibilities. Keep returning to the project charter as the project progresses to minimize scope creep. In addition, the team should prepare themselves by having business processes analyzed in advance of implementation. Finally, build a buffer into the timelines to plan for inevitable changes and delays.

2. Ongoing Support for All Staff through the Learning and Maintenance Phases

Create mechanisms for all staff to provide input into database implementation. Establish consistent and clear expectations for staff performance in terms of their roles and responsibilities with respect to the system. Build in a large number of super-users at the program level, as they will ensure that support is structured in, and be prepared with replacements should any of the super-users need to step down due to fatigue, job changes, and turnover. In addition, it is important that system maintenance and support is
included in the project scope. Finally, communicating with the staff early on and regularly to demonstrate the value of the EMR system will enhance buy-in and user acceptance.

3. Incremental Implementation

Limit initial implementation to one or two teams or PHUs. This allows organizations to work out the kinks before rolling out to other teams or PHUs in a phased manner. The teams and PHUs who are selected to implement the system first should be chosen objectively based on readiness and benefit from early participation.

Start small and expand in increments. Build the most need functionality (must haves) first. Additional functionality can be added with subsequent releases. It is important that staff members are clearly told that initial improvements will be confined to processes that contribute to planned roll-out and that opportunities to develop the system will become available later on.

4. Customization will require Vendor and IT Support

Establish clear requirements for how the EMR system can meet public health needs. Have a clear agreement with the vendor about the system’s ability to service public health functions and how much customization will be needed. Choose a system that requires as little customization as possible, and/or factor in the amount of work required for customization.

Contact other PHUs to see what system they are using and determine their vendor satisfaction. If organizations choose to use the same vendor, they can also ask if the other PHUs would be willing to act as a support mechanism. Organizations can negotiate ongoing support as part of their request for proposal (hours, costs, what is included in terms of services, etc.). They should not wait to figure out these details later on in the implementation process.

Be sure to have enough buy-in from Corporate IT to have a sufficient amount of technical resources to change the setup/structure of the system. Have in-house expertise available as well to customize templates. If someone on the project management team can serve as the bridge between IT and Practitioners, the customization process will be much more efficient and much less confusing. Programs must also be prepared to potentially adapt their business processes to the EMR system.

Commit to developing a solution that works for the end user by focusing on the end-user’s workflow and needs. Develop a collaborative relationship with IT so that they can understand what the workflow is and why it is important. This relationship will ensure that they commit to the project themselves and keep pushing to find solutions when problems arise.

5. Role of Front Line Staff during Implementation

Involve front line staff from the beginning of the project and keep them informed through structured communication methodologies.

6. Funding

Secure funding. PHUs may want to consider looking outside of the traditional funders. For example, they may look to universities affiliated with a particular vendor or to cost sharing with other organizations.
7. Have a Good Understanding of the Ongoing or Hidden Costs
Have a clear agreement with the vendor about costs and hidden costs. Dividing the implementation process into phases reduces immediate costs. In addition, frequent reviews of processes and needs are important to determine whether the ongoing costs are absolutely necessary.

Manage expectations and be open to ideas provided by front line staff. Consider using a ticketing system and monitoring support requests to identify trends and source problems. Be prepared for workflow and business processes to change when the EMR system is implemented. Understand when the entire system needs to be modified versus when smaller changes to the workflow will be sufficient to meet the needs of the change requests. Ask the following three questions throughout implementation. Should the planned scope of use be modified to keep records management simple? Can the defined needs be reduced or simplified in order to avoid escalating records management complexity? Can business processes be adapted to the EMR rather than setting up the EMR to meet all business process requirements?

9. Data Migration
Avoid migration of old and unneeded data, as well as the scanning in of documents. Instead, it is more efficient to automate the migration process. Even though automation slows down the initial setup, it will raise the accuracy of the data, as it will verify the information, rather than just enter in the data.

10. Collaboration
Consider standardization approaches, as well as approaches to mitigate variation across health units, to be able to collaborate with other health units that are on different systems. In addition, consider assessing the state of readiness of health units when creating implementation plan. Consider using an open source system to facilitate collaboration with other health units. Identify more experienced health units that have already established EMR systems and determine whether they are willing to share their knowledge with other health organizations. Consider exploring creating shared models between health care units. In addition, once a vendor is chosen, consider developing a strategic relationship with other organizations with the same vendor.

11. Trade-Offs
Factor in workload change and increased maintenance cost to implementation plan as such changes are intrinsic to EMR deployment. As mentioned above, it is also useful to consistently review processes and needs to determine whether the ongoing costs are absolutely necessary. The wide variation in use-cases in public health leads to the need to accept a capability bias toward one particular capacity. It may be that no software exists that can meet all the needs of a PHU without requiring extensive customization and sacrificing usability and simplicity. This issue may be an argument for health units collaborating on the development of a dedicated public health EMR, or developing consistent standards that all PHUs can follow if they use different EMRs.
Shared Purchase Service

1. **Procurement Options**
   Option 1. Purchase a single EMR, to be implemented across all participating PHUs, with shared costs for support, training, and implementation, or;
   Option 2: Purchase an EMR within each of the ConnectingOntario hubs, cSWO, cNEO, and cGTA, with shared costs for support, training, and implementation within those hubs. Leverage existing Information Systems in a LHIN by partnering, where possible.

   The recommended approach is that PHUs purchase a single EMR or partner with an existing health care organization that has an EMR and share the costs of support, training, and implementation per each of the ConnectingOntario hubs. Provincial initiatives for information exchange lend themselves to Public Health. partnering with health care organizations that have already implemented an EMR system would reduce implementation, training, and ongoing support costs.

2. **Partnership**
   Public health to partner with a health care organization that has already implemented an EMR and has a contract with the vendor that allows the option to offer the contract to other organizations, piggy back. Individual contracts could be signed for each participating organization, or a single contract signed on behalf of the participating organizations.

   TransForm SSO in Erie St. Clair indicated that this would be an excellent option for PHUs, as they would be able to link onto an existing installation with a data center and servers already established. This reduces the cost of installing a separate, new data center.

   The second option would be to work with partner with a procurement agency, if wanting to purchase an EMR for a group of PHUs in a LHIN or ConnectingOntario Hub, such as an existing SSO or Group Purchasing Organization (GPOs), which would develop and run a Request for Proposal (RFP) if required for Public Health and their stakeholders. HMMS, Transform and Shared Services West have expressed interest in supporting this initiative for PHUs, with the addition of industry experts and technical support.

3. **Project Management**
   Hire a Project Management leader as soon as possible to ensure that the right staff members are acquired for the project and to work with Public Health Leaders regardless of acquisition approach for EMR.
Funding

Investigate funding available through alternate channels such as Canada Health Infoway. Leveraging existing ConnectingOntario hubs and use of their assets may support this approach. Other funding sources may become available if a collaborative approach is taken for an EMR and especially if single vendor and a ASP model which is preferred.

Requirements

1. **Common EMR**
   PHU’s should consider establishing a process for acquisition of a common EMR solution that includes forming a shared purchasing group or leverage an existing purchase service. Similarly, PHU’s who chose to move forward to individually procure an EMR should consider including a ‘piggy-back’ clause in their RFP to allow other interested PHU’s to leverage the procurement vehicle and potentially incent vendors to submit bids that are reflective of a broader contract opportunity.

2. **System Consideration**
   Currently, in order to connect with provincial eHealth assets an EMR offering must be Ontario MD certified. Depending on internal IT support capacity, it is recommended that PHU’s chose Ontario MD certified EMR offerings with ASP (hosted) service delivery platforms.

   Alternatively PHU’s may wish to explore partnership options to leverage existing physician EMRs certified by OntarioMD or connect with hospitals who have larger more robust hospital information systems (e.g. CERNER, EPIC) that address the needs of Public Health.

3. **Interoperability**
   When procuring an EMR, consideration should be given to the ability for the system to access existing information systems and data hubs within LHINS and associated Connecting Ontario Hubs. Consideration should also be given to a vendors willingness/ability to support new technology standards and tools being adopted by the Ministry and eHealth Ontario to support system interoperability.

4. **Privacy and Security**
   PHU’s should conduct privacy (PIA) and security (TRA) assessments independently of chosen vendor. PHU’s may also consider contracting external privacy and security consultants who possess current expertise in rapidly changing eHealth environment.
Other Opportunities

1. COMOH identify a group of members or steering committee of senior decision makers including COMOH, MOHLTC, alpha, OPHA, PHO and subject matter experts that would lead the discussion of public health integration within provincial strategy for the electronic health record or digital space recognizing Patient First. Because of the importance of Public Health as a contributing member to the digital landscape in Ontario, it is suggested that a project with a designate project lead/director be struck to promote and influence the decision-making and processes pertaining to a provincial electronic health record, inter-operability, data hub, etc.

2. Investigate the impacts of local health system reform, Patient's First to leverage data sharing and technology. Public health units may benefit from shared information and tools arising from forming new relationships between boards of health and LHINs.

3. COMOH to work closely with eHealth Ontario to develop a provincial roll out strategy for Connecting Ontario for all local public health units. The strategy should include:
   a. communicating the benefits to local health units;
   b. working with public health units and engage them as partners

4. Update eHealth Ontario strategy/blueprint etc. to ensure public health and their systems included.
References


Hanrahan, C. Shared Services in Health Care [Environmental Scan issue 24]. Ottawa: Canadian Agency for Drugs and Technologies in Health; 2001.


Task Group: Lessons Learned EMR Implementation Report, July 2016

Task Group: Interoperability Report, October 2016

Task Group: Requirements Report, October 2016

Task Group: Funding and Shared Purchase Service Report, October 2016
Appendix A – Glossary of Terms

**Application Architecture:** A client who declines to provide any demographic or personal information other than a first name or an alias.

**Application Platform Interface (API):** The interconnection (“go between”) that allows one component of one software program to communicate with another software program.

**BORN:** Ontario’s Better Outcomes Registry & Network (BORN) was established in 2009 to collect, interpret, share and rigorously protect critical data about pregnancy, birth and childhood in the province.

**BIS:** The BORN Information System (BIS) enables the collection of, and access to, data on every birth and young child in Ontario. Sourced from hospitals, labs, midwifery practice groups and clinical programs, the data are collected through a variety of mechanisms including HL7, batch upload, and manual entry. Information is reported via standard reports and analytical tools within the BIS.

**Business Requirements:** The critical activities of an application that must be performed to meet organizational objectives. They are high-level statements of the goals, objectives, or needs.

**CHI:** Canadian Health Infoway (CHI). **HIS** – Health Information System, a comprehensive, integrated information system designed to manage all the aspects of a hospital’s operation, such a medical, administrative, financial, and legal issues and the corresponding processing of services.

**Client:** A client who declines to provide any demographic or personal information other than a first name or an alias.

**ClinicalConnect:** ClinicalConnect provides secure electronic access to aggregated Electronic health records (EHR) in real time, anytime, anywhere, enabling a complete view across the continuum of care. Information from hospitals, CCAC & oncology centres can be viewed by authorized healthcare providers through the ClinicalConnect secure web-based portal. Currently supported by E- Health Ontario with implementation across 3 regions in ON.

**cGTA:** Connecting GTA (clinical connect for GTA regions).

**cSWO:** Connecting Southwestern Ontario (clinical connect for Southwestern Ontario regions).

**cNEO:** Connecting Northern and Eastern ON (clinical connect for NE ON regions).

**Client:** An individual, family, community group, agency, business or premise, coalition or community network, professional group, population or any other entity who receive care and/or service by a health unit employee, student or intern.

**Core Data Set (CDS):** The sub-set of patient medical data that can be transferred between two EMR Systems and as defined in the CDS XSD Schema.
**Clinical Management Systems:** See EMR.

**Data Portability (DP):** The import-export process by which the Core Data Set (CDS) is being transferred between two EMR Systems.

**Data Dictionary:** The collection of discrete data elements including their definition and relationships and referenced by Ontario EMR Requirements Repository.

**Data Migration:** The process of moving a significant volume of data elements from one physician office system to another, often in an effort to maintain the continuity of care.

**Data Sharing Agreement:** An agreement between a healthcare provider, or a group thereof, on the one hand, and an institution, health authority, or service provider on the other hand, that sets out the terms for the sharing of electronic health information.

**Digital Immunization Health Repository (DIHR):** The Ontario Immunization Repository/Database.

**Digital Health Delivery Platform (DHDP—formerly PHDP):** The core platform/framework that provides the platform, infrastructure and architecture that all the Ontario Panorama extensions and new capabilities are built upon. DHDP is the combination of the Public Health Delivery Platform that now includes the Drug Repository.

**Digital Health Drug Repository (DHDR—formerly the CDPR):** A new service being implemented that will allow primary care users access to a person drug history. Initial release will contain ODP recipients and Possibly Narcotics.

**E-health:** The provision of health care services supported by modern electronic information management tools, processes and resources.

**EMR Offering:** The combination of EMR software, services, and support offered by a vendor. **EMR** – Electronic Medical Record, a partial health record under the custodianship of a health care provider(s) that holds a portion of the relevant health information about a person over their lifetime.

**EHR** – Electronic Health Record, a complete health record under the custodianship of a health care provider(s) that holds all relevant health information about a person over their lifetime.

**Electronic personal health Record (ePHR):** ePHR are self-maintained records of an individual's health and healthcare. The information may come from healthcare providers, carers or the individual, but it is usually the responsibility of the individual to maintain their records.

**Encryption:** Transforming data into a format that cannot be read unless a specific key is used to reverse the process. One of its purposes is to ensure privacy by keeping information hidden from anyone for whom it is not intended.

**Exit Agreement Clause:** In reference to an EMR, a clause contained within a contract between a physician/clinic (vendor agreement) or in a clinic practice agreement that outlines how EMR fees are impacted when a physician joins or leaves a clinic.
**Electronic Signature**: A generic term referring to a wide variety of non-manual signature options. An electronic signature may consist of letters, characters, numbers or symbols in digital form, attached to or associated with an electronic document.

**Family Physician/ General Practitioner (GP)**: A medical professional licensed as a family physician or general practitioner.

**Group Purchasing Model**: See GPO below.

**Fast Health Interoperability Resource (FHIR)** is an HL7 specification for Healthcare Interoperability.

**Group Purchasing Organization (GPO)**: A group purchasing organization (GPO) is an entity that helps healthcare providers-such as hospitals, nursing homes and home health agencies-realize savings and efficiencies by aggregating purchasing volume and using that leverage to negotiate discounts with manufacturers, distributors and other vendors.

**Health Card Number**: The lifetime identification number assigned to all eligible residents within a jurisdiction (province) for the purpose of receiving provincially funded insured health services.

**Hospital Report Manager (HRM)**: An eHealth solution that enables clinicians using an OntarioMD-certified EMR to securely receive patient reports electronically from participating sending facilities, a growing number of hospitals and specialty clinics. Text-based transcribed Medical Record reports, (i.e. Discharge Summary), and Diagnostic Imaging (excluding image) reports are pushed from the sending facility directly into the clinician’s EMR.

**Interoperability**: The ability of different information systems to meaningfully exchange information in a timely manner, either within the same network or across dissimilar networks (usually standards-based).

**Immunization Connect Ontario (ICON)**: Will enable data from PHUs’ immunization reporting portals to be submitted for validation into Panorama (source Panorama Champions meeting slides).

**iPHIS**: iPHIS stands for Integrated Public Health Information System. It is the database used by public health units to report information on cases of reportable diseases to the MOHLTC.

**ISCIS**: ISCIS stands for the Integrated Services for Children Information System (ISCIS) is a multi-tier case management system designed to enable public health units across Ontario to effectively administer the HBHC program. In late January 2012, ISCIS software was upgraded to version 3.0. ISCIS software is currently managed by the MCYS, operating on the eHealth Ontario platform.

**Immunize.ca**: Immunize Canada is a coalition of national non-governmental, professional, health, consumer, government and private sector organizations with a specific interest in promoting the understanding and use of vaccines recommended by the National Advisory
Committee on Immunization; and Immunize.ca is their website. Noteworthy is the development of an App that provides: provincial immunization schedule information, reminders of upcoming immunizations due and other resources/updates on vaccine preventable diseases. See www.immmunize.ca for more information.

**Interface Owner:** The 3rd party (e.g. MOHLTC) or vendor which: provides specifications for the interface, defines and conducts testing of the interface; and authorizes other entities such as EMR vendors to implement an interface and make it operational.

**Metadata:** Electronic background information generated in the course of creating and maintaining an electronic record e.g. dates and times of insertions/deletions, details of user access.

**Most Responsible Physician (MRP):** The attending physician who is primarily responsible for the day-to-day care of patient. In absence, the covering physician will fulfill the MRP role.

**mIMMS:** Mobile light-weight iOS version of Panorama designed for the iPAD.

**OHISS:** The Oral Health Information Support System (OHISS) is a production system that supports program implementation, monitoring, evaluation and payment accountability for the oral components of the Ontario Public Health Standards (OPHS) and the Healthy Smiles Ontario Program.

**OntarioMD:** OntarioMD has been very successful in supporting physicians in the selection, implementation and adoption of EMRs. Their mission is to ensure that the future clinical and usability needs of physicians' practices are incorporated into EMRs to support the evolving healthcare environment. OntarioMD also manages the EMR Specifications and the EMR Certification Program. For more information see www.ontariomd.ca.

**Panorama:** An initiative to provide public health professionals with a comprehensive, secure, web-based information system to more efficiently manage immunization information, vaccine inventory, and cases and outbreaks of communicable diseases. It is mostly used by Public Health Nurses and MOHLTC Staff.

**PHIX:** Public Health Immunization Exchange will provide a way for PHUs to validate and batch-upload Immunization Records - similar to the Student Information Exchange tool (STIX) - for demographic and immunization uploads. PHIX is an integral component of the Public Health Delivery Platform (PHDP) now the DHDP. This tool will serve as a mechanism to validate and upload data from a variety of sources including Day Nurseries, EMRs and ICON where data can be extracted in the correct format.

**PHU – Public Health Unit**

**Primary Care:** The first level of contact individuals have with the healthcare system, constituting the first element of a continuing healthcare process.

**Pseudonymous Key:** A set of numbers and/or characters assigned to a record to conceal the identity of the individual.
**Referral:** A request from one practitioner that another practitioner render a service with respect to a specific patient.

**Role-Based Access:** A system by which EMR users are grouped by functional area and provided access to the EMR based on the user’s role.

**Subscriber:** The physician, physician group, clinic, other health care provider, or representation of any of the foregoing, who is the signatory to the Subscriber Agreement.

**SOAP:** Subjective, Objective, Assessment, and Plan. The SOAP note is a format for documenting patient encounters.

**Shared Services Agreement:** A collaborative strategy in which a subset of existing business functions are concentrated into a new, semi-autonomous business unit that has a management structure designed to promote efficiency, value generation, cost savings and improved service for the external customers of the parent corporation, like a business competing in the open market. **SSO** – Shared Service Organizations are mandated to provide supply chain services to member healthcare organizations, with the objective to improve service levels, maximize efficiencies, and generate savings that can be reinvested in direct patient care **Anonymous**

**System-to-System:** The transfer of data between two systems. S2S is significant to future electronic health record integration points and interoperability between EMRs, the Pharmaceutical Information Network and pharmacy systems.

**Single Sign-On (SSO):** A method of access control that enables a user to authenticate once to gain access to the resources of multiple software systems. **STIX:** Panorama’s Student Information Exchange currently provides a way for PHUs to validate and batch-upload student demographic files received from schools and school boards. STIX only allows for the uploading of the student demographics whereas PHIX allows for the uploading of both client demographic records as well as immunization records.

**Templates:** A standard form with pre-defined fields that can be generic or user-customized.

**User:** One who uses a computer system or software for the purposes of entering, retrieving or viewing data.

**Vendor Non-Disclosure Agreement (VNDA):** An agreement that outlines the administrative, physical and technical mitigation strategies to consider when personal or health information is made accessible to non-clinic employees that are providing a specific service to the clinic.

**MOHLTC:** Ministry of Health and Long-term Care - provincial agency responsible for health of all Ontarians.

**WHO:** World Health organization—a specialized agency of the United Nations that is concerned with international public health.

**PHO:** Public Health Ontario—crown agency which provides technical support to MOHLTC.
**PHU:** Public Health Unit—one of the 36 Public Health Units in Ontario.

**BOH:** Board of health.

**PHAC:** Public Health Agency of Canada.

**CIHI:** Canadian Institute for Health Information.

**CIHR:** Canadian Institutes of Health Research.

**WSIB:** Workplace Safety Insurance Board.

**Physician Group:** A group of funding eligible physicians.

**OPHS:** The Ontario Public Health Standards (OPHS) and Protocols establish the minimum requirements for fundamental public health programs and services to be delivered by Ontario's 36 boards of health.
### Appendix B – Task Group Members

**Task Group Project Lead: Gloria Ringwood**

**TASK GROUP: Lessons Learned - Chair Abidah Ratansi**

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<th>Health Unit/Organization</th>
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<td>Peel Public Health</td>
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<td>Cathie Walker, Director, Health Protection</td>
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<td>Dr. Joyce Lock, Medical Officer of Health</td>
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**TASK GROUP: Interoperability – Chair Faron Kolbe**

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<td>Toronto Public Health</td>
<td>Faron Kolbe, Manager, CDC Health Informatics</td>
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<td>Perth District Public Health</td>
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<td>Oxford Health Unit</td>
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<tr>
<td>Ministry of Health and Long Term Care</td>
<td>Chis Pentleton, Manager, Architecture, Alignment and Innovation</td>
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**TASK GROUP: FUNDING AND SHARED PURCHASE SERVICE – Chair Shaya Dhinsa**

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<td>Ottawa Public Health</td>
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**TASK GROUP: REQUIREMENTS – Chair Kevin Neil**

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Appendix C  Interoperability Survey - TASK GROUP
INTEROPERABILITY

The COMOH EMR Inter-operability task group is determining how Ontario public health units use their electronic medical records (EMR) system in combination with other local or provincially mandated information systems. The objective of this survey is to better understand the health unit EMR digital landscape, the level of potential duplication across systems and the level of sharing of EMR data (if any) within and across your organization.

NOTE: This survey was sent only to health units known to have an EMR. The results of the survey will be summarized and responses may be attributed to your health unit and will support a presentation to the COMOH EMR Working Group.

For more information visit: http://www.alphaweb.org/general/custom.asp?page=COMOH_EMR

For specific question or technical issues with the survey please email fkolbe@toronto.ca

Health Unit _______________. Your Name ________________.

1. Confirm which EMR system your health unit is using? (check only one)
   - Excelicare
   - Intrahealth
   - Hampson
   - Nightingale
   - Oscar
   - Penelope
   - PS Suite
   - TCHIS
   - XWave
   - Other, please specify….

2. Can you briefly describe how your health unit uses your EMR system (program areas, clinical, non-clinical)?

3. Does your health unit’s EMR system adhere to Ontario’s current EMR Specifications/Certification via OntarioMD (check one only)
   - Yes
   - No
   - Not Sure

4. How is data stored in your health unit’s EMR system? (check one only)
   - All data are stored on the web (ASP model)
   - All data are stored on a standalone server
   - Not sure
   - Other, please specify….

5. Do you maintain the same data in your health unit EMR system and any other internal electronic system in your health unit or any provincial information system such as iPHIS or Panorama (e.g. lab info, immunizations, nursing notes)?
   - Yes
   - No (if no, skip to question 12)
6. In what system(s) does the same data co-exist with your health unit's EMR system? (check all that apply)
   - iPHIS
   - Panorama Immunization Module
   - Panorama Inventory Module
   - ISCIS
   - OHISS
   - Other, please specify…

7. You indicated that same data co-exists in [response from q6] and your health unit's EMR system. What types of data (or fields) co-exist in both systems?

8. How is data transferred from one system to the next? (check all that apply)
   - Manually re-keyed
   - Automatically uploaded via a batch process
   - Other, please specify…

9. What value, if any, is gained by entering the same data into [response from q6] and your health unit's EMR system?

10. You indicated that you keep the same data in [response from q6] and your EMR. Is this same data kept current in both systems at all times?
    - Yes (if yes, skip to question 12)
    - No

11. You indicated that you do not keep your EMR and [response from q6] current at all times, therefore which system is your 'source of truth' (EMR or [response from q6])?

12. Do you share your EMR data with any other external EMR system (i.e. outside your PHU)? For example, is your EMR connected to another PHU, community agency, long term care or hospital? In the box below please indicate which other EMRs you are connected/integrated with and how they are connected/integrated:

13. Do you have any policies/procedures specific to the inter-operability between your EMR and other systems that you are willing to share with our working group? Please describe:

14. If your health unit has developed or procured any software applications or other technical solutions to enable inter-operability between your EMR and other systems, please describe below:

Thank you for taking the time to complete this survey.
Appendix D - Benefits and Challenges of Using an EMR Survey Results

TASK GROUP: FUNDING AND SHARED PURCHASE SERVICE

Section A – General Questions

A1 – 13 PHUs responded to survey
• Region of Waterloo Public Health and Emergency Services
• Huron County Health Unit
• Durham Region Health Department
• Timiskaming
• Haliburton-Kawartha-Pine Ridge District Health Unit
• Brant County Health Unit
• Porcupine Health Unit
• Algoma Health Unit
• Kingston, Frontenac, Lennox and Addington Health Unit
• Northwestern Health Unit
• Niagara Region Public Health
• Hamilton Public Health Services
• Hastings Prince Edward

A2 – EMRs currently in use in Ontario PHUs
A3 – Is the model of your EMR an ASP (hosted) system?

<table>
<thead>
<tr>
<th>Yes (5)</th>
<th>No (5)</th>
<th>Don’t Know (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Nightingale</td>
<td>• Hampson</td>
<td>• Intrahealth Profile</td>
</tr>
<tr>
<td>• Intrahealth Profile</td>
<td>• OSCAR</td>
<td>• Hampson</td>
</tr>
<tr>
<td>• OSCAR (2)</td>
<td>• Intrahealth Profile (3)</td>
<td>• Penelope</td>
</tr>
<tr>
<td>• ACURRO</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A4 – Do you share EMR with another PHU?

Haliburton-Kawartha-Pine Ridge District Health Unit and York Health Unit both use Hampson EMR, but only share system upgrades. The other 12 PHUs responding to the survey do not share at all with another PHU.

A5 – How is the data stored in your EMR system?

<table>
<thead>
<tr>
<th># of PHUs</th>
<th>Response</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>All data stored on the web</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>All data stored on a standalone server</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>All data are stored in a cloud-type server</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Other: Hosted on corporate servers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other: Private cloud</td>
<td></td>
</tr>
</tbody>
</table>

A6 – PHIPA features included with EMR

<table>
<thead>
<tr>
<th>EMR</th>
<th>PHIPA Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACURRO</td>
<td>Secure sign-in with user credentials</td>
</tr>
<tr>
<td></td>
<td>Auditing</td>
</tr>
<tr>
<td></td>
<td>Ability to lock charts</td>
</tr>
<tr>
<td></td>
<td>Documentation time and name stamped</td>
</tr>
<tr>
<td>Hampson</td>
<td>Secure sign-in with user credentials</td>
</tr>
<tr>
<td></td>
<td>Role-based access</td>
</tr>
</tbody>
</table>
### Intrahealth Profile
- Secure sign-in with user credentials
- Role-based access
- Customizable case privacy controls
- Lock-box/"Break the glass” functions
- Auditing
- Versioning
- Daily backup of data to separate onsite server with encryption
- Recovery of data
- Firewall security
- Ability to merge and unmerge records
- De-identified reporting capabilities
- Non-ASP hosting option available

### Nightingale
Nothing specific. PHU using this system indicates that PHIPA Standard Operating Procedures guide how people access, use and disclose personal health information. The system is just a tool which is used to do work.

### OSCAR
- Secure sign-in with user credentials
- Auditing
- Consent check box
- Privacy and collection statement scripts
- Approved by OntarioMD, so features required are included

### Penelope
Secure sign-in with user credentials

<table>
<thead>
<tr>
<th>A7 – Disclosure/Release of Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EMR can produce data at granular level</strong></td>
</tr>
<tr>
<td>---------------------------------------</td>
</tr>
<tr>
<td>ACURRO</td>
</tr>
<tr>
<td>Hampson</td>
</tr>
<tr>
<td>Intrahealth Profile</td>
</tr>
<tr>
<td>Nightingale</td>
</tr>
<tr>
<td>OSCAR</td>
</tr>
<tr>
<td>Penelope</td>
</tr>
</tbody>
</table>

### A8 – Data Backups
All PHUs reported the ability to back up data (off & onsite - 3, off only - 3, on only – 4, unsure - 2). All back-up data are stored within Canada.
### A9 – Year of implementation

<table>
<thead>
<tr>
<th>EMR</th>
<th>PHU</th>
<th>Year Implemented</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACURRO</td>
<td>NWHA</td>
<td>2015</td>
</tr>
<tr>
<td>Hampson</td>
<td>Huron County</td>
<td>2008</td>
</tr>
<tr>
<td></td>
<td>Haliburton-Kawartha-Pine Ridge</td>
<td>2015</td>
</tr>
<tr>
<td>Intrahealth Profile</td>
<td>Niagara Region</td>
<td>2001</td>
</tr>
<tr>
<td></td>
<td>Brant County</td>
<td>2012</td>
</tr>
<tr>
<td></td>
<td>Algoma</td>
<td>2012</td>
</tr>
<tr>
<td></td>
<td>Porcupine</td>
<td>2012</td>
</tr>
<tr>
<td></td>
<td>Durham Region</td>
<td>2014</td>
</tr>
<tr>
<td>Nightingale</td>
<td>Region of Waterloo</td>
<td>2005</td>
</tr>
<tr>
<td>OSCAR</td>
<td>Timiskaming</td>
<td>2011</td>
</tr>
<tr>
<td></td>
<td>KFLA</td>
<td>2014</td>
</tr>
<tr>
<td></td>
<td>Hamilton</td>
<td>2014</td>
</tr>
<tr>
<td>Penelope</td>
<td>Hastings Prince Edward County</td>
<td>2009</td>
</tr>
</tbody>
</table>

### A10 – Number of Users

#### Number of Users of EMR System

![Graph showing the number of users of EMR system](image)

### A11 – Maximum # of Users

2 PHUs report that EMR has a max # of users (Brant – 40, Hastings – 20). The other PHUs do not have a maximum number of users.
A12 – Licenses

Open-source systems (e.g. OSCAR) do not require license purchases. Other PHUs reported that most licenses were included with purchase of system. 3 PHUs (using Intrahealth Profile) reported that they purchased additional licenses (15, 50, 75) as needed.

A13 – Program Areas using EMR system

A14 – Implementation Timeline

Length of implementation ranged from 5 months to 3 years, with implementations continuing through other programs areas for most PHUs.

A15 – Staff Level Changes

- 3 PHUs (Haliburton-Kawartha-Pine Ridge, Hamilton, and Niagara) reported an increase in staff levels.
- 1 PHU (Timiskaming) reported a decrease in staff level by 1 staff member.
- 9 PHUs did not require a change in staff levels.

A16 – EMR Functions Currently Used

<table>
<thead>
<tr>
<th>EMR Function</th>
<th>ACURRO</th>
<th>Hampson</th>
<th>Intrahealth</th>
<th>Nightingale</th>
<th>OSCAR</th>
<th>Penelope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scheduling</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Wait list management</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Coding visits</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Physician documentation</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Nursing documentation</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Case management</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Connection to Personal Health Record</td>
<td>-</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>-</td>
</tr>
<tr>
<td>Patient medication tracking</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>-</td>
</tr>
<tr>
<td>Generating receipts</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Inventory of Medications</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
### Inventory of Supplies

<table>
<thead>
<tr>
<th>Service</th>
<th>Hospital A</th>
<th>Hospital B</th>
<th>Hospital C</th>
<th>Hospital D</th>
<th>Hospital E</th>
<th>Hospital F</th>
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<tbody>
<tr>
<td>Health history</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Diagnostic testing tracking</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>-</td>
<td>✓</td>
<td>-</td>
</tr>
<tr>
<td>Physical assessments</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Generating reports</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Other:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Client billing/POS</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reporting</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Custom form design</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Template and letter creation</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health card swiping</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Referrals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Walk-in clinic flow management</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Medication formulary</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Secure messaging between users</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Alerts to other providers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

### Section B – Planning and Implementation of the EMR

B17 – Backfill of Staff Positions

- 4 PHUs reported that they were required to backfill positions in order to dedicate staff time to work on the implementation of the EMR
  - Waterloo – Nightingale
  - Durham – Intrahealth Profile
  - Timiskaming – OSCAR
  - Hamilton – OSCAR

B18 – Workflow Mapping

- 5 PHUs completed workflow mapping as part of EMR planning:
  - Algoma – Intrahealth Profile
  - KFLA – OSCAR
  - Hamilton – OSCAR
  - Porcupine – Intrahealth Profile
  - Niagara – Intrahealth Profile

B19 – Number of training hours per user type

<table>
<thead>
<tr>
<th>Employee Type</th>
<th>Number of Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurses</td>
<td>8-40</td>
</tr>
<tr>
<td>Admin Assistants</td>
<td>6-140</td>
</tr>
<tr>
<td>Physicians</td>
<td>0-50</td>
</tr>
<tr>
<td>Other staff</td>
<td>8-35</td>
</tr>
</tbody>
</table>
### B20 – Additional Hardware Required

<table>
<thead>
<tr>
<th>EMR</th>
<th>PHU</th>
<th>Additional Hardware Purchased</th>
<th>Total Cost of Hardware ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACURRO</td>
<td>NWHA</td>
<td>None</td>
<td>-</td>
</tr>
<tr>
<td><strong>Hampson</strong></td>
<td>Huron County</td>
<td>None</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Haliburton-Kawartha-Pine Ridge Health Unit</td>
<td>Laptop computers Wireless hub Server</td>
<td>15,000</td>
</tr>
<tr>
<td><strong>Intrahealth Profile</strong></td>
<td>Brant County</td>
<td>None</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Algoma</td>
<td>None</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Porcupine</td>
<td>Health card scanners</td>
<td>Not specified</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Label printers</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Standalone printers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Durham Region</td>
<td>Cloud pipe</td>
<td>2,000</td>
</tr>
<tr>
<td></td>
<td>Niagara Region</td>
<td>Computers</td>
<td>30,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Servers</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Label printers</td>
<td></td>
</tr>
<tr>
<td><strong>Nightingale</strong></td>
<td>Region of Waterloo</td>
<td>Dymo printers</td>
<td>15,000-20,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>General printers</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Desktop computers</td>
<td></td>
</tr>
<tr>
<td><strong>OSCAR</strong></td>
<td>Timiskaming</td>
<td>Server</td>
<td>5,000-10,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Label printers</td>
<td></td>
</tr>
<tr>
<td><strong>KFLA</strong></td>
<td>Hamilton</td>
<td>None</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Server</td>
<td>20,700</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Label printers</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Laptops</td>
<td></td>
</tr>
<tr>
<td><strong>Penelope</strong></td>
<td>Hastings Prince Edward County</td>
<td>None</td>
<td>-</td>
</tr>
</tbody>
</table>

### B21 – Additional Networking Purchases

No PHUs were required to purchase extra network capabilities to implement the EMR.

### B22 – Additional Enhancements and Programming

<table>
<thead>
<tr>
<th>EMR</th>
<th>PHU</th>
<th>Additional Hardware Purchased</th>
<th>Total Cost of Hardware ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACURRO</td>
<td>NWHA</td>
<td>None</td>
<td>-</td>
</tr>
<tr>
<td><strong>Hampson</strong></td>
<td>Huron County</td>
<td>None</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Haliburton-Kawartha-Pine Ridge Health Unit</td>
<td>Laptop computers Wireless hub Server</td>
<td>15,000</td>
</tr>
<tr>
<td><strong>Intrahealth Profile</strong></td>
<td>Brant County</td>
<td>None</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Algoma</td>
<td>None</td>
<td>-</td>
</tr>
<tr>
<td>PHU</td>
<td>EMR</td>
<td>Migration/Archival Entry</td>
<td>Program Area</td>
</tr>
<tr>
<td>------------------------------</td>
<td>---------------</td>
<td>-----------------------------------------------------------------------------------------</td>
<td>-------------------------------</td>
</tr>
</tbody>
</table>
| NWHA                         | ACURRO        | • Migration from different electronic system  
• Entry of archival data  
• Performed by ACURRO                              | Sexual Health                 | $18,000                        |
| Huron County                 | Hampson       | • Entry of archival data                                                                  | Sexual Health                 | 240 hours of staff time        |
| Algoma                       | Intrahealth   | • Entry of archival data                                                                  | Not specified                 | $145,000 (4 developers for 9 months) |
| Hamilton                     | OSCAR         | • Single migration from MS Access                                                        | Mental Health/Street Outreach | Used in-house time, no additional cost |
| Niagara                      | Intrahealth   | Not specified                                                                            | Sexual Health                 | $750                           |

**B23 – Migration and Archival Data**

6 PHUs migrated archival data or migrated data from another system or both. 5 PHUs did not do either

- NWHA
  - Migration from different electronic system
  - Entry of archival data
  - Performed by ACURRO
  - Program Area: Sexual Health
  - Cost: $18,000

- Huron County
  - Entry of archival data
  - Program Area: Sexual Health
  - Cost: 240 hours of staff time

- Algoma
  - Entry of archival data
  - Program Area: Not specified
  - Cost: $145,000 (4 developers for 9 months)

- Hamilton
  - Single migration from MS Access
  - Program Area: Mental Health/Street Outreach
  - Cost: Used in-house time, no additional cost

- Niagara
  - Not specified
  - Program Area: Sexual Health
  - Cost: $750
B24 – Initial User Training

All PHUs conducted initial user training with employees when the EMR was implemented. Only 1 PHU reported that the EMR vendor did not provide user training (OSCAR). Additional costs for training ranged from $7,500 - $150,000, depending on the size of the organization and the number of users requiring training. 12 PHUs used the “train the trainer” model, with 5-6 PHUs reporting that there are employees still requiring training on the EMR system.

B25 – Project Planning (e.g. designation of a lead, formation of a working group, project charter, project implementation plan, project communication, etc.)

3 PHUs reported not performing any project planning for the EMR implementation.

• NWHA – ACURRO
• Huron County – Hampson
• Hastings Prince Edward County – Penelope

The remaining 10 PHUs did complete project planning, and used staff hours to plan for the project, with costs of conducting project planning absorbed in existing staff hours.

B26 – Participation in Contract Negotiations

<table>
<thead>
<tr>
<th>PHU</th>
<th>EMR</th>
<th>Migration/Archival Entry</th>
<th>Program Area</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>NWHA</td>
<td>ACURRO</td>
<td>• Migration from different electronic system</td>
<td>Sexual Health</td>
<td>$18,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Entry of archival data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Huron County</td>
<td>Hampson</td>
<td>• Entry of archival data</td>
<td>Sexual Health</td>
<td>240 hours of staff time</td>
</tr>
<tr>
<td>Algoma</td>
<td>Intrahealth</td>
<td>• Entry of archival data</td>
<td>Not specified</td>
<td>$145,000 (4 developers for 9 months)</td>
</tr>
<tr>
<td>Hamilton</td>
<td>OSCAR</td>
<td>• Single migration from MS Access</td>
<td>Mental Health/Street Outreach</td>
<td>Used in-house time, no additional cost</td>
</tr>
<tr>
<td>Niagara</td>
<td>Intrahealth</td>
<td>Not specified</td>
<td>Sexual Health</td>
<td>$750</td>
</tr>
</tbody>
</table>

B27 – Additional office accommodations, furniture, or other related items

No PHUs purchased these additional items.
B28 – Quality Assurance Checks

• 3 PHUs did not perform quality assurance checks
  o Huron County
  o Timiskaming
  o Hastings Prince Edward County

• 10 PHUs did conduct quality assurance tests
  o Algoma: $1,000
  o Remaining PHUs reported costs absorbed in existing staff time

B29 – Years Using Current EMR system

<table>
<thead>
<tr>
<th>EMR</th>
<th>PHU</th>
<th>Length of Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACURRO</td>
<td>NWHA</td>
<td>1 year</td>
</tr>
<tr>
<td>Hampson</td>
<td>Huron County</td>
<td>6 years</td>
</tr>
<tr>
<td></td>
<td>Haliburton-Kawartha-Pine Ridge Health Unit</td>
<td>4 years</td>
</tr>
<tr>
<td>Intrahealth Profile</td>
<td>Brant County</td>
<td>4 years</td>
</tr>
<tr>
<td></td>
<td>Algoma</td>
<td>4 years</td>
</tr>
<tr>
<td></td>
<td>Porcupine</td>
<td>1 year</td>
</tr>
<tr>
<td></td>
<td>Durham Region</td>
<td>2 years</td>
</tr>
<tr>
<td></td>
<td>Niagara Region</td>
<td>5 years</td>
</tr>
<tr>
<td>Nightingale</td>
<td>Region of Waterloo</td>
<td>10-11 years</td>
</tr>
<tr>
<td>OSCAR</td>
<td>Timiskaming</td>
<td>2 years</td>
</tr>
<tr>
<td></td>
<td>KFLA</td>
<td>2 years (Family Health and Tobacco)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 months (Sexual Health)</td>
</tr>
<tr>
<td></td>
<td>Hamilton</td>
<td>5 years</td>
</tr>
<tr>
<td>Penelope</td>
<td>Hastings Prince Edward County</td>
<td>6 years</td>
</tr>
</tbody>
</table>

Section C – Post-implementation

C30 – Ongoing Annual Costs

Ongoing yearly costs range from $4,000 – $100,000

C31 – Staff person dedicated to the EMR

9 PHUs used an existing staff member(s) who was reassigned to be responsible for the EMR. 3 PHUs hired externally for a staff member whose primary responsibility is to manage the EMR. 2 PHUs do not have a dedicated staff member who works on the EMR.
C32 – Hours spent training new employees

<table>
<thead>
<tr>
<th>Role</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurses</td>
<td>7-35</td>
</tr>
<tr>
<td>Admin Assistants</td>
<td>7-21</td>
</tr>
<tr>
<td>Physicians</td>
<td>8-35</td>
</tr>
<tr>
<td>Other staff</td>
<td>5-14</td>
</tr>
</tbody>
</table>

C33 – Ongoing costs per year for support from vendor

<table>
<thead>
<tr>
<th>EMR System</th>
<th>Vendor</th>
<th>Annual Cost for Ongoing Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>AcurroEMR</td>
<td>QHR Technologies</td>
<td>&lt;$1,000 for admin support</td>
</tr>
<tr>
<td>Nightingale</td>
<td>Nightingale Informatix Corporation</td>
<td>$20,000-$25,000 for licensing</td>
</tr>
<tr>
<td>Hampson</td>
<td>N/A</td>
<td>~$4,000</td>
</tr>
<tr>
<td>Profile by Intrahealth</td>
<td>Intrahealth Canada Ltd.</td>
<td>$35,000-$100,000</td>
</tr>
<tr>
<td>OSCAR</td>
<td>N/A (open-source)</td>
<td>Developer costs (vary)</td>
</tr>
<tr>
<td>Penelope</td>
<td>Athena Software</td>
<td>$4,600</td>
</tr>
</tbody>
</table>

C34 – Audits/Reviews of EMR system

3 PHUs have not audited or reviewed their EMR system. 8 PHUs have conducted audits and/or reviews of the system. Costs for these activities have been absorbed into staff costs. 1 PHU was required to hire a programmer, which added the cost of that person’s salary.

Section D – Estimated Cost Savings

D35 – PHUs have not seen cost savings associated with avoiding transcription.

D36 – PHUs have not seen a cost savings associated with the prevention of adverse drug events.

D37 – PHUs have not seen cost savings associated with avoiding downloading laboratory results.

D38 – Although PHUs do not report cost savings associated with space allocation, 1 PHU did report that there is more space in office due to reduction of paper filing and reuse of filing room as a new office area with 6 workstations.

D39 – Additional comments:

- As our health unit has not yet completed the implementation of EMR (Intrahealth Profile) for all programs (currently 4 program areas are fully implemented), we're continuing to improve our implementation process with each program we bring on board. While the initial program to implement the EMR relied heavily on vendor support thus incurring the vendor costs, we've since created the necessary resources in house (1 permanent FTE and one temporary FTE) devoted to the implementation and customization of profile for our different program areas. Additionally, while efficiencies have certainly been created as a result of moving to an EMR, the cost savings have not been quantified at this point. Further benefits include risk mitigation for file physical transfers, standardized documentation and improved legibility, and enhanced reporting of custom data elements.
Niagara Region – Intrahealth Profile

- Thank you for the opportunity to fill out the survey – I was not assigned to this program during the implementation period (that was the previous manager). I have attempted to answer as best I can. We are a small Health Unit so the training resources are minimal. Have not had new staff in the program for a number of years. If you need any additional info – feel free to contact me.

Huron County – Hampson

- Sorry I cannot account for some questions as cost savings are within our program... I know there are cost savings but we have not attached a figure.

Haliburton-Kawartha-Pine Ridge – Hampson
# Appendix E – Connecting Ontario Contacts

<table>
<thead>
<tr>
<th>Connecting Ontario Hub</th>
<th>Contact Information</th>
</tr>
</thead>
</table>
| cSWO                   | John Stoneman, Director  
john.stoneman@lhsc.on.ca |
| cGTA                   | Angela Lianos, Director  
angela.lianos@ehealthontario.ca |
| cNEO                   | Mylene Cooke, Stakeholder Relations, Governance and Communications Lead  
mycooke@toh.ca |
Appendix F: Request for Information – TASK GROUP REQUIREMENTS

Task Group: Requirements is preparing a comprehensive set of EMR requirements that may assist health unit's considering developing or procuring an EMR for clinical and/or non-clinical settings. To this extent, Task Group 2 is requesting that health units share both technical and non-technical requirements either clinical or non-clinical and general/administrative requirement documents for the purpose of collating into a single source document that will be made available to all PHUs. The following are examples of areas of functional requirements:

Clinical services (client-centric):

- Immunization
- Breastfeeding
- Sexual health
- Mental Health
- Travel
- Dental
- Methadone

Non-clinical (group-centric):

- Tobacco cessation
- Speech and Language
- Public Health Event Registration
- Prenatal classes
- HBHC

Administrative/General

- Scheduling
- Report Generation (standard selection and adhoc)
- Interoperability / integration
- Form and report templates developed by individual PHUs are saved to common directory and available to all PHUs
- Clinical Documentation
- OHIP/Billing
- Scalability

If you could provide your documents in word format to ease the compilation of the material into master documents this would be greatly appreciate. For large documents please zip.

PLEASE SEND THE INFORMATION REQUESTED TO Eva Eisler BY NO LATER THAN MARCH 28TH:  eeisler@toronto.ca

Thank you for your assistance.
### APPENDIX G: List of Shared Services/Shared Purchase Services – TASK GROUP: FUNDING AND SHARED PURCHASE SERVICE

<table>
<thead>
<tr>
<th>Organization</th>
<th>Website</th>
<th>Contact name</th>
<th>Mandate</th>
<th>How to set up a shared model?</th>
<th>Which models have been successful in certain areas and why? (e.g., group purchasing within associations like AOHC)</th>
<th>What are the benefits and limitations of models in existence?</th>
<th>Is it vendor dependent and, if so, how can the model be made flexible to adapt?</th>
<th>How can a shared services organization be responsive to its member organizations?</th>
<th>Other relevant info</th>
</tr>
</thead>
</table>
| AOHC        |         | Rodney Burns, presentation to COMOH EMR working group, March 30, 2016 | AOHC is Ontario’s voice for community-governed primary health care. We represent 108 community-governed primary health care organizations. Our membership includes Ontario’s Community Health Centres, Aboriginal Health Access Centres, Community Family Health Teams and Nurse Practitioner-Led Clinics. | Setting up a formal contract between members can help with governance model. | CHCs have taken on additional costs without additional funding. | Financial Benefits:  
  - Cost approximatel y 25% less to implement.  
  - 10 year agreement to freeze licence costs (saving of over $200k)  
  - Any paid EMR enhancement s must be made available to all Nightingale customers in Ontario | Vendor dependent. AOHC and partners in Nova Scotia represent more than 75% of Nightingale on Demand’s customer base. Being a major stakeholder means that users can get more features from the vendor. | To become responsive, you need to hear feedback from your members. This includes getting their approval prior to making major changes to the system. This practice has led to lower complaints from users. | Implemented Canada’s largest EMR project  
  - 84 members are live on shared Nightingale on Demand  
  - 6 Francophone centres are waiting the multilingual product  
Rodney will provide WG with  
  - AOHC’s RFI and RFP |
| Plexxus     |         | David E. Yundt, President & CEO March 30, 2016 | Plexxus is a shared service organization for 11 Toronto area hospitals. They are a non-for-profit, not publicly traded organization with a Board of Governors (with up to 8 members). | Set up a formal contractual agreement among the members. | Spoke about the success of Plexxus model. Factors are: strong governance; lots of attention to managing stakeholder. | Benefits  
  - Save $ through standardization e.g., common procurement & contracts  
  - Savings are | Yes, vendor dependant.  
  - ‘Flexibility’ options: if some hospitals want a specific feature, Costs are pro-rated based on hospitals’ total operating budget | Lots of opportunities for members to give input and be engaged e.g., working groups, forums, a governance “Council” | - took 2 years to implement  
- have service metrics and report by individual hospital and ‘rolled up’ report.  
They use a Balanced Scorecard  
- started with 25 interested hospitals and ended up with 11  
- started with a 10 year contract. Just |
hospital executives and 4
industry members). Provide 3 shared services:
- warehouse w/ ‘consumable goods’
- procurement negotiation & contracts
- financials (using SAP)

VISION
Plexxus is the leading shared services organization in Canadian health care.

MISSION
Plexxus relentlessly delivers value to its Members and customers through service excellence.

The governance structure for:
- initial project implementation;
- ongoing governance

Prorate fees:
- based on operating budgets (e.g., for fixed system costs)
- proportionate to volume of activity (e.g., warehouse costs)

Shared services:
- reinvested into member organizations

Limitations
- All orgs are different from each other (different size, culture, experience) and coming to common ground takes TIME. Someone is always compromising, and they are always questioning “What are we getting out of this?”

Moves slow. Each come to the table with their pre-existing systems and technology. Takes time to harmonize. Decision-making takes time; each hospital has their own Board and they need to be consulted on major decisions

they can request it (and pay for it) – and all members will benefit from it

While there is some flexibility, it is not customizable. There is some ‘tailoring’ e.g. warehouse deliveries 6 days/wk vs 5 days/wk, but essentially it is one harmonized system.

Questions he asked us to consider:
- Do all PHUs have to be on board?
- Can we move forward without all PHUs being ‘in’?

Michael Garron Hospital (member)

Funding from MOHLTC to Every year fees are paid by hospitals.

Good working relationships and Plexxus being guided by CFOs

They are responsive at an operational level. They are renewed for 5 years with an additional 2 years for hosp to ‘give notice’ to opt out of Plexxus.

Learnings: it is a contract company – paid for X services and if you want more services you pay
Betty Best, Director of Support Services
April 12, 2016

Incent shared services to be set up. Partly funded by each of the member hospitals.

Initially based on total supplies dollars you spent. Detailed contracts signed by hospitals – penalty fee if discontinued participation. If savings, then portion went to Plexxus and a portion went to hospitals. Have changed funding formula over time. Now pay portion of overhead, IT fees, staffing fees. Pay for hospitals employees, pay for portion of distribution centres.

Have regular meetings. There is wiggle room for customization.

Strengths: have resources that maybe you wouldn’t have had. Pool of people to ask about RFPs (bigger hospitals have more RFPs). Plexxus took over initiation of a new computer system (SAP) – our hospital would have been challenged to the financing of it – economies of scale.

Challenges: had to find efficiencies in department; in many of the contracts did see cost-savings and often more expensive; have less staff so harder to create workarounds plus each hospital has own PM so made own decision re and CEOs to keep in mind the bottom line and hospital demands – accountable to hospitals. In operations, feels like a competing priority.

Plexxus has performance indicators shared with CEO and CFO. Quarterly stats for logistics, supportive of initiatives and also bring forward initiatives.

In operations, feels like a competing priority.

Plexxus has performance indicators shared with CEO and CFO. Quarterly stats for logistics, supportive of initiatives and also bring forward initiatives.

Initially didn’t see savings. Now that funding formula has tightened up we should. Supportive but didn’t get as much value as thought. Good to staff, responsive. The IT projects especially were particularly useful and valuable. Resources valuable – but MGH already had enough resources and had a good working relationship with other hospitals. Initially other hospitals found it very expensive – takes a lot of money to set up an organization.
The Association of Ontario Midwives is the professional organization representing midwives and the practice of midwifery in the province of Ontario.

- Advocates for the professional interests of midwives and for the Ontario Model of Midwifery Care.
- Provides public education and promotes midwifery as an integral part of the Ontario health care system.
- Represents midwives to the Ministry of Health to maintain appropriate funding for midwifery services.
- Provides ongoing peer support to all members, including educational and professional development.
- Develops clinical and other practice guidelines and promotes midwifery research.
- Administers a benefits package.

Have not set up this model yet. Plan to have one EMR system for all practices.
### Ontario association of community care access centres (OACCAC)

The OACCAC is a not-for-profit organization that serves as the collective voice for our members, Ontario’s 14 Community Care Access Centres (CCACs).

**VISION, MISSION AND VALUES**

Our commitment to excellence is driven by our organizational values. By working together and serving as the collective voice for CCACs, we champion innovation and performance improvements that help our members and health-care system partners provide Ontario’s families with timely, high-quality care.

**Governance Model Now:**

1. **100 working groups where people are engaged to make a difference.**
2. Also consist of an executive management working group.

**The Client Health and Related Information System (CHRIS) is a web-based patient management system for Ontario’s CCACs that plays an integral role in enabling CCACs to provide quality care to patients.**

- 14 mini systems were created
- Now there are plans to integrate this into one
- CCACs support referral from hospital to community. Some do not use the referral functionality

No, The Association developed its own electronic system because software providers were not able to meet all their needs.

They work together with all the programs to ensure that member feedback is heard and included in the major decisions.

Currently funded by CCACs, funded by MOHLTC for health care connect, or external partners for care innovation, best practice, quality

Board of members vote on any changes (technology, BP, quality, research) – not executives –

Decisions are ultimately approved by CEO Council.

<table>
<thead>
<tr>
<th>Region of Peel - Shared services agreement between a vendor and a Region of Peel</th>
<th>N/A</th>
<th>N/A</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>This is an agreement – a connection with vendor is required. We can request information and ask questions directly to the vendor around expectations and pricing established under the contract.</td>
<td>N/A – other agencies can enter the contract for purchase of goods and services, but these would be bound by the terms, conditions and pricing established under the contract.</td>
<td>N/A in this area of focus.</td>
<td></td>
</tr>
<tr>
<td>Cloud system means there would be a central portal for various agencies as opposed to individual licenses which would require people to install software on their own local systems. This is most likely how other vendors would propose proceeding.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TransForm Shared Service Organization</td>
<td>Vision</td>
<td>Lead innovation and change to achieve health system transformation&lt;br&gt;Pull IT out of healthcare organizations and align systems strategically by forming a separate corporation to centralize operations. &lt;br&gt;TransForm also manages IT/IM services for clients, which supports organizations that may not have the technical resources to do this.</td>
<td>Outcomes by which the contract was evaluated on (i.e., did we get what we paid for or not)</td>
</tr>
<tr>
<td>Renee McIntyre, Director of Strategic Sourcing</td>
<td>Mission</td>
<td>As a strategic partner, we are dedicated to delivering exceptional service and creating new opportunities to improve value to the health system.</td>
<td>Hard to get all members organs to agree when each org has separate goals, directions, and budgets. &lt;br&gt;Funding for project should be explored as much as possible.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Not necessarily – SSO advocates on behalf of member organizations, vendor could change depending on need of members.</td>
</tr>
<tr>
<td>Shared Service West</td>
<td>Vision</td>
<td>Integrating for value. Leaders in service. &lt;br&gt;SSW manages logistics and some procurements for member organizations, with procurement&lt;br&gt;Legal and data warehousing outsourced to 3rd party.</td>
<td>Listen to member organization needs, explore opportunities to partner with existing HIS, and highlight benefits and savings for member organizations.</td>
</tr>
<tr>
<td>Marc Lemaire, Vice President</td>
<td>Mission</td>
<td>SSW adds Value to our customers in support of Health care excellence by providing leadership in Integrated and Innovative Service Delivery. &lt;br&gt;Funding – initiative from OHLTC to look at Supply Chain Management will affect SSOs going forward&lt;br&gt;No, SSW advocates on behalf of member organization, so as needs changes so can vendor.</td>
<td>Create a Board of Directors, with representation for member organizations, representation from customers (if applicable) and representation from an independent entity.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Members share costs of yearly operating budget. Cost is based on size and activity. Customers (not members) pay a fee-for-service to participate in procurement/supply chain management services.</td>
<td></td>
</tr>
<tr>
<td>Shared Support Services Southeastern Ontario (3SO)</td>
<td>Vision</td>
<td>A valued and strategic health system partner, providing shared support services in Southeastern Ontario. Gain commitment from organizations willing to participate, and encourage communication regularly and Use best-value method for procurement, group purchasing is beneficial to both the member orgs and the vendor.</td>
<td>Encourage commitment and develop a schedule for meetings well in advance. Provide education around the procurement process and support all involved, particularly evaluation team, in doing their</td>
</tr>
<tr>
<td>Kathie Richer, Senior Manager Strategic Sourcing</td>
<td>Mission</td>
<td>Gain commitment from organizations willing to participate, and encourage communication regularly and Use best-value method for procurement, group purchasing is beneficial to both the member orgs and the vendor.</td>
<td>Must gain buy-in and keep lines of communication open</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mohawk Shared Services</td>
<td>Vision</td>
<td>To excel as a shared services organization by delivering services that support health care and our communities.</td>
<td></td>
</tr>
<tr>
<td>-----------------------</td>
<td>--------</td>
<td>---------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mission</td>
<td>To serve our clients and community through: • Providing superior and expanding services to clients; • Delivering financial value to clients; • Maximizing the effectiveness of our business systems; and • Attracting and retaining employees who are driven to serve.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Manage processes, including change and project management. Collaborate with other SSOs (Plexxus, SSW). Build credibility and reputation with other SSOs and member orgs.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bring members together with an agreement that maintains exclusivity (GPOs are not exclusive).</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Challenging to gain member trust and confidence, careful to avoid scope creep, as member orgs will all pull in different directions seeking more information.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No, vendor can change depending on needs of member organizations.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Keep “ear to the ground” – be open to new ideas and information, stay on the cutting edge to remain competitive and support member organization initiatives.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Member orgs tend to be keen at the beginning, but once workload is set, may back out. Important to gain commitment in the early stages to ensure project success and delivery of stated outcomes.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Healthcare Materials Management Services (HMMS)</th>
<th>Vision</th>
<th>We are committed to providing superior quality service to our customers, creating partnerships with our customers and suppliers to achieve exceptional value, and building a work environment that respects the contribution of each team member and promotes continuous quality improvement.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toby O’hara, General Manager</td>
<td>Mission</td>
<td>Gain member organization commitment, develop competitive documents and contract, and award contract to winner. Two options: 1. Use members agreements 2. Run procurement process for Both options work; important to gain member commitment either way. Usually orgs are ready to commit so member agreement not necessary in this case.</td>
</tr>
<tr>
<td></td>
<td>Move away from individual purchases. MOHLTC funding and initiatives are moving toward shared purchases.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No, vendor can change depending on needs of member organizations.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Advocate on behalf of member organizations and listen to their needs.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Organizations may not have capital funds available, so it is not always realistic to obtain full buy-in.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>When running procurement process, can have 1 contract with multiple signatures, or can have a contract for each organization – depends on needs and sharing requirements.</td>
<td></td>
</tr>
</tbody>
</table>
Healthcare Materials Management Services is a Joint Venture Between London Health Sciences Centre and St. Joseph's Health Care, London, to provide integrated Purchasing, Accounts Payable and Inventory Management Services on a regional basis. We are relentless in our commitment to outstanding service.

<table>
<thead>
<tr>
<th>Champlain Health Supply Services</th>
<th>any and all interested stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vision</td>
<td>Ensure you have a strong project management leader and team. Be prepared to make decisions in consultation with organizational champions. Create development strategy and align with strategic direction of member organizations.</td>
</tr>
<tr>
<td>Mission</td>
<td>Single installation with cloud access works well, but requires commitment from member organizations and vendor.</td>
</tr>
<tr>
<td></td>
<td>Challenges around move from paper to electronic process, with compromise between member orgs required for success.</td>
</tr>
<tr>
<td></td>
<td>Unless bound by contract, vendor can change depending on organizational needs.</td>
</tr>
<tr>
<td></td>
<td>Establishing leadership is critical, with representation from member organizations. Support decision-making and process evaluation by helping organizations make decisions and navigate the procurement and implementation processes.</td>
</tr>
<tr>
<td></td>
<td>Getting all orgs on the same platform from a technical perspective is challenging. Share planning and resource management across other shared service organizations.</td>
</tr>
</tbody>
</table>

John Martin, Regional Sourcing Lead & Danielle Page-Goulet, Sourcing Manager
### Requirements Definitions

<table>
<thead>
<tr>
<th>Functional Requirement (behaviour or function)</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administer System</td>
<td>Maintenance of the system including configurations</td>
</tr>
<tr>
<td>Archive Records</td>
<td>Removing records that are no longer required</td>
</tr>
<tr>
<td>Assess Client</td>
<td>Determining the client’s needs based on physical and verbal assessment</td>
</tr>
<tr>
<td>Chart Encounter</td>
<td>Documenting the encounter with the client</td>
</tr>
<tr>
<td>File Billings</td>
<td>Creation billings and posting to client account for services and/or products provided</td>
</tr>
<tr>
<td>Generate Forms/Labels</td>
<td>Creation of forms or labels with pre-populated data based on the context of the generation</td>
</tr>
<tr>
<td>Generate Report</td>
<td>Analytical and detail reports, Including the ability to extract data</td>
</tr>
<tr>
<td>Manage Duplicates</td>
<td>The identification and merging of duplicate client records</td>
</tr>
<tr>
<td>Manage Inventory</td>
<td>The management of inventory for the clinic</td>
</tr>
<tr>
<td>Manage Workflow</td>
<td>Automated and manual task generation and assignment to users</td>
</tr>
<tr>
<td>Message Users</td>
<td>System messaging</td>
</tr>
<tr>
<td>Obtain Support</td>
<td>System and contextual support</td>
</tr>
<tr>
<td>Prescribe Medication</td>
<td>Prescribing medication to a client for treatment</td>
</tr>
<tr>
<td>Process Payment</td>
<td>Processing funds for a product or service provided</td>
</tr>
<tr>
<td>Refer Client</td>
<td>Notifying other HCPs of the client for further follow-up. This could be within the clinic's user base or to an external provider</td>
</tr>
<tr>
<td>Register Client</td>
<td>The searching, creating, or updating of a client and their demographics</td>
</tr>
<tr>
<td>Requisition Lab Test</td>
<td>Request to perform a lab test</td>
</tr>
<tr>
<td>Review Medical History</td>
<td>The review of the clients EMR</td>
</tr>
<tr>
<td>Review Records</td>
<td>The review of client records for duplicates management and/or archive purposes</td>
</tr>
<tr>
<td>Schedule Client</td>
<td>The scheduling of a client’s appointment(s) for the clinic</td>
</tr>
<tr>
<td>Schedule Clinic</td>
<td>The scheduling of staff for a clinic</td>
</tr>
<tr>
<td>Non Functional Requirement (system operation)</td>
<td>Definition</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Audit</td>
<td>The ability of the system to capture audit records of user actions and data</td>
</tr>
<tr>
<td>Customization</td>
<td>The ability of the system to be updated to align with the business</td>
</tr>
<tr>
<td>Data Migration</td>
<td>The ability for data to be migrated into the system from a legacy application</td>
</tr>
<tr>
<td>Interoperability</td>
<td>the ability of different information technology systems and software applications to communicate, exchange data, and use the information</td>
</tr>
<tr>
<td>Performance</td>
<td>The speed at which specific operations must perform</td>
</tr>
<tr>
<td>Portability</td>
<td>The ability of the system to be accessed from various points</td>
</tr>
<tr>
<td>Privacy</td>
<td>The ability of the system to enforce client privacy policies</td>
</tr>
<tr>
<td>Records Retention</td>
<td>The ability of the system to retain records and archive when not needed</td>
</tr>
<tr>
<td>Reporting</td>
<td>The ability of the system to produce reports and extract data</td>
</tr>
<tr>
<td>Scalability</td>
<td>The ability of the system to support projected future growth</td>
</tr>
<tr>
<td>Security</td>
<td>The ability of the system to enforce security policies and protect data</td>
</tr>
<tr>
<td>Standardization</td>
<td>The ability of the system to conform with standardization of data</td>
</tr>
<tr>
<td>Sustainability</td>
<td>the endurance of systems and processes</td>
</tr>
<tr>
<td>Technical</td>
<td>the technical requirements</td>
</tr>
<tr>
<td>Technical Environment</td>
<td>the technical environment specifics in which the system must operate</td>
</tr>
<tr>
<td>Usability</td>
<td>the degree to the system can be used by specified consumers to achieve quantified objectives with effectiveness, efficiency, and satisfaction</td>
</tr>
<tr>
<td></td>
<td>in a quantified context of use</td>
</tr>
</tbody>
</table>
Clinical Requirements Summary

The following list of requirements are a summary of clinical requirements from the Toronto, Waterloo, Niagara and Durham public health units, and the College of Physicians and Surgeons of Ontario. The intention is to use these requirements as a baseline to establish a complete list of detailed requirements. The use of the word "must" in the description of the requirement is to indicate a mandatory requirement. You can change this word to "should" if this requirement is not deemed mandatory for your implementation purposes.

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Req Type</th>
<th>ID</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administer System</td>
<td>Functional</td>
<td>F01</td>
<td>The PHU must be able to maintain reference information including external providers, office locations, and custom support documentation</td>
</tr>
<tr>
<td>Archive Records</td>
<td>Functional</td>
<td>F02</td>
<td>Administrators must be able to archive records according to the PHU’s data retention policies</td>
</tr>
<tr>
<td>Assess Client</td>
<td>Functional</td>
<td>F03</td>
<td>Standardized checklists of questions must be available to easily assess a client</td>
</tr>
<tr>
<td>Audit - Audit Log</td>
<td>Non Functional</td>
<td>NF01</td>
<td>The system must maintain an audit trail as per the CNO standards that tracks access to clients including searches, creation, updates, and deletes</td>
</tr>
<tr>
<td>Audit - Retain Values</td>
<td>Non Functional</td>
<td>NF02</td>
<td>The system must provide a method to maintain data that has been updated/deleted and a method to view previous values</td>
</tr>
<tr>
<td>Backup</td>
<td>Non Functional</td>
<td>NF26</td>
<td>The system must automatically backs up files and allows the recovery of backed-up files or otherwise provides reasonable protection against loss of, damage to, and inaccessibility of, information.</td>
</tr>
<tr>
<td>Chart Encounter - Progress Notes</td>
<td>Functional</td>
<td>F04</td>
<td>Free text notes for documenting encounter must comply with CNO standards</td>
</tr>
<tr>
<td>Chart Encounter - Procedures</td>
<td>Functional</td>
<td>F05</td>
<td>Procedures completed should be easily selected (check box) by a care provider</td>
</tr>
<tr>
<td>Chart Encounter - Diagraming</td>
<td>Functional</td>
<td>F06</td>
<td>Diagrams where care providers can annotate their findings easily must be available</td>
</tr>
<tr>
<td>Chart Encounter - Telephone Log</td>
<td>Functional</td>
<td>F07</td>
<td>Users require an interface for logging telephone calls with clients and anonymous calls</td>
</tr>
<tr>
<td>Chart Encounter - Simultaneous Data Entry</td>
<td>Functional</td>
<td>F08</td>
<td>The system must provide the ability to chart sessions simultaneously while preventing records from locking</td>
</tr>
<tr>
<td>Chart Encounter - Search</td>
<td>Functional</td>
<td>F09</td>
<td>The system must provide a search function within charts</td>
</tr>
<tr>
<td>Chart Encounter - Group Session</td>
<td>Functional</td>
<td>F10</td>
<td>Users must be able to chart group / family sessions without the need to collect individual demographic information</td>
</tr>
<tr>
<td>Chart Encounter - Immunization</td>
<td>Functional</td>
<td>F11</td>
<td>Administrators must be able to set immunization schedules and forecasters</td>
</tr>
<tr>
<td>Chart Encounter - Medical History</td>
<td>Functional</td>
<td>F12</td>
<td>A client's medical history, allergies and general health are required to be captured</td>
</tr>
<tr>
<td>Chart Encounter - Immunization</td>
<td>Functional</td>
<td>F13</td>
<td>Users must be able to record immunizations administered to a client</td>
</tr>
<tr>
<td>Chart Encounter - Assistance</td>
<td>Functional</td>
<td>F14</td>
<td>Users must be able to record items given to a client for assistance</td>
</tr>
<tr>
<td>Chart Encounter - Consent</td>
<td>Functional</td>
<td>F15</td>
<td>Consent for treatment (or withdraw) must be captured</td>
</tr>
<tr>
<td>Chart Encounter - Administrative Action</td>
<td>Functional</td>
<td>F16</td>
<td>Administrative clerks must be able to document any administration actions taken with a client record (mail, registration, linking to client)</td>
</tr>
<tr>
<td>Chart Encounter - Interaction</td>
<td>Functional</td>
<td>F17</td>
<td>Encounter must be categorized by type, nature, and staff intervention, etc</td>
</tr>
<tr>
<td>Customization - Fields / Templates</td>
<td>Non Functional</td>
<td>NF03</td>
<td>The system must provide the ability to customize fields and/or forms</td>
</tr>
<tr>
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</tr>
<tr>
<td>Customization - Notifications</td>
<td>Non Functional</td>
<td>NF04</td>
<td>The system must generate automatic notifications based on custom business rules</td>
</tr>
<tr>
<td>Customization - Reports / Forms / Letters</td>
<td>Non Functional</td>
<td>NF05</td>
<td>The system must allow for customization of reports, forms, and letters</td>
</tr>
<tr>
<td>Customization - Billing</td>
<td>Non Functional</td>
<td>NF06</td>
<td>The system must allow for customization of billing based on the clinic</td>
</tr>
<tr>
<td>Customization - Warnings / Errors</td>
<td>Non Functional</td>
<td>NF07</td>
<td>The system must provide the ability to customize warnings and error messages</td>
</tr>
<tr>
<td>Customization - User Preferences</td>
<td>Non Functional</td>
<td>NF08</td>
<td>The system must allow individual users or user groups to customize the application experience</td>
</tr>
<tr>
<td>Customization - Terminology</td>
<td>Non Functional</td>
<td>NF09</td>
<td>The system must provide the ability to set custom abbreviations and other terminology</td>
</tr>
<tr>
<td>Data Migration</td>
<td>Non Functional</td>
<td>NF10</td>
<td>The system must have the ability to migrate and upload data from other sources</td>
</tr>
<tr>
<td>File Billings</td>
<td>Functional</td>
<td>F18</td>
<td>Finance functionality is required to bill client, manage accounts receivable, generate invoices and financial reports</td>
</tr>
<tr>
<td>Generate Forms/Labels</td>
<td>Functional</td>
<td>F19</td>
<td>Users must be able to easily generate forms and labels with prepopulated information</td>
</tr>
<tr>
<td>Generate Report</td>
<td>Functional</td>
<td>F20</td>
<td>Canned or ad-hoc reporting functionality is required for individual client records or larger client sets</td>
</tr>
<tr>
<td>Interoperability</td>
<td>Non Functional</td>
<td>NF11</td>
<td>The system must be interoperable with various other systems including OLIS, GIS applications, pharaceutical, Exchange servers, ISCI, MOHLTC billing, and PHU Internal applications</td>
</tr>
<tr>
<td>Manage Duplicates</td>
<td>Functional</td>
<td>F21</td>
<td>Duplicate client records and charts must be easily managed and resolved within the system</td>
</tr>
<tr>
<td>Feature</td>
<td>Type</td>
<td>Code</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>----------------</td>
<td>------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Manage Inventory</td>
<td>Functional</td>
<td>F22</td>
<td>Functionality to manage inventory within a clinic is required</td>
</tr>
<tr>
<td>Manage Workflow</td>
<td>Functional</td>
<td>F23</td>
<td>Workflow management tools to track client status in clinic, and generate tasks and assign to users are required to assist users with managing the clinic flow</td>
</tr>
<tr>
<td>Message Users</td>
<td>Functional</td>
<td>F25</td>
<td>User must be able to communicate with individual users or groups within the system</td>
</tr>
<tr>
<td>Obtain Support</td>
<td>Functional</td>
<td>F26</td>
<td>Support material must be easily obtained within the system</td>
</tr>
<tr>
<td>Performance</td>
<td>Non Functional</td>
<td>NF12</td>
<td>The system must perform fast page loads and fast saving of data</td>
</tr>
<tr>
<td>Portability</td>
<td>Non Functional</td>
<td>NF13</td>
<td>The system must be accessible remotely via mobile devices, satellite offices, and multiple office locations</td>
</tr>
<tr>
<td>Portability - Client Interface</td>
<td>Non Functional</td>
<td>NF14</td>
<td>The system must have a client web portal that allows client's to interface with their own medical record and book appointments</td>
</tr>
<tr>
<td>Prescribe Medication</td>
<td>Functional</td>
<td>F27</td>
<td>The recording of prescribed medications and warning of drug interactions / contraindications is required as part of charting an encounter</td>
</tr>
<tr>
<td>Privacy</td>
<td>Non Functional</td>
<td>NF15</td>
<td>The system must pass a PHUs PIA</td>
</tr>
<tr>
<td>Process Payment</td>
<td>Functional</td>
<td>F28</td>
<td>The system must have the ability to process payments for items and services; including the ability to process partial payments, manage accounts receivable, and void payments</td>
</tr>
<tr>
<td>Records Retention</td>
<td>Non Functional</td>
<td>NF16</td>
<td>The system must comply with records retention by-laws</td>
</tr>
<tr>
<td>Refer Client</td>
<td>Functional</td>
<td>F29</td>
<td>Care providers must be able to generate and track referrals for clients</td>
</tr>
<tr>
<td>Feature</td>
<td>Type</td>
<td>Code</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>------------</td>
<td>------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Register Client</td>
<td>Functional</td>
<td>F30</td>
<td>Administrative clerks must be able to quickly register a client including anonymous clients. This includes the ability to read a HC to pre-populate fields</td>
</tr>
<tr>
<td>Register Client - Search</td>
<td>Functional</td>
<td>F31</td>
<td>The system must have a search function for clients that minimizes the likelihood of creating duplicate records</td>
</tr>
<tr>
<td>Register Client - Relationships</td>
<td>Functional</td>
<td>F32</td>
<td>Linking client records to create relationships is required</td>
</tr>
<tr>
<td>Reporting</td>
<td>Non Functional</td>
<td>NF17</td>
<td>The system must be able to generate statistical and detailed reports</td>
</tr>
<tr>
<td>Requisition Lab Test</td>
<td>Functional</td>
<td>F33</td>
<td>Users must be able to requisition lab tests for a client</td>
</tr>
<tr>
<td>Review Medical History</td>
<td>Functional</td>
<td>F34</td>
<td>User must be able to review a client's medical history in an easy to read format that shows progression over time</td>
</tr>
<tr>
<td>Review Records</td>
<td>Functional</td>
<td>F35</td>
<td>Users should be able to retrieve client records based on a clinic date in order to complete audits or internal Q/A review</td>
</tr>
<tr>
<td>Scalability - Client Records</td>
<td>Non Functional</td>
<td>NF18</td>
<td>The system must be able to support a minimum of 20,000 new annual client records without the need to upgrade the database, operating system or other software components.</td>
</tr>
<tr>
<td>Scalability - Users</td>
<td>Non Functional</td>
<td>NF19</td>
<td>The system must be able to support up to 200 users simultaneously, across multiple locations</td>
</tr>
<tr>
<td>Schedule Client</td>
<td>Functional</td>
<td>F36</td>
<td>Users must be able to schedule clients for future visits ensuring time and staff availability</td>
</tr>
<tr>
<td>Schedule Clinic</td>
<td>Functional</td>
<td>F37</td>
<td>Administrators must be able to schedule clinics to set schedules for staff, set reminders, notifications and alerts, and manage wait lists</td>
</tr>
<tr>
<td>Security</td>
<td>Non Functional</td>
<td>NF20</td>
<td>The system must include security features to limit access to functions and data</td>
</tr>
<tr>
<td>Requirement</td>
<td>Type</td>
<td>Code</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------</td>
<td>------</td>
<td>-------------</td>
</tr>
<tr>
<td>Setup Clinic</td>
<td>Functional</td>
<td>F38</td>
<td>Administrator of the application should be able to assign necessary parameters to the clinic name (i.e. St. Catharines, Niagara Falls, etc. address, phone number), input users into the system based on user rights (nurse, nurse practitioner, physician, clerical staff, etc.)</td>
</tr>
<tr>
<td>Standardization</td>
<td>Non Functional</td>
<td>NF21</td>
<td>The data captured must comply with federal and provincial data standards</td>
</tr>
<tr>
<td>Sustainability</td>
<td>Non Functional</td>
<td>NF22</td>
<td>The vendor of the system must be responsive to enhancement requests to sustain the product overtime</td>
</tr>
<tr>
<td>Technical</td>
<td>Non Functional</td>
<td>NF23</td>
<td>Various technical requirements. See details</td>
</tr>
<tr>
<td>Technical Environment</td>
<td>Non Functional</td>
<td>NF24</td>
<td>The solution must fit within the PHUs technical infrastructure if hosted at the PHU and/or be compatible with deployed web browsers and mobile hardware</td>
</tr>
<tr>
<td>Trace Contacts</td>
<td>Functional</td>
<td>F39</td>
<td>User must be able to trace contacts and log details of contacting them</td>
</tr>
<tr>
<td>Track Compliance</td>
<td>Functional</td>
<td>F40</td>
<td>The system must track a client's compliance to treatment and follow-ups</td>
</tr>
<tr>
<td>Upload File</td>
<td>Functional</td>
<td>F41</td>
<td>Users must be able upload various files and attach to client records</td>
</tr>
<tr>
<td>Usability</td>
<td>Non Functional</td>
<td>NF25</td>
<td>The system must be user-friendly, intuitive, and require minimal support/training. (See details below for various usability needs)</td>
</tr>
</tbody>
</table>

**Non-Clinical Requirements**

The following list of requirements is a summary of non-clinical requirements from the Toronto public health unit. The intention is to use these requirements as a baseline to establish a complete list of detailed requirements.

**General System needs and Requirements**

Compliance with Professional Documentation Standards (CNO/CDO)

1. Ensures centralized access to secured single client record for all customer types that allows a full view of services for the client.
2. Organize content within client record by service (issue)
3. Allow for online documentation directly into service record
4. Organize interactions in chronological order by Service provider
5. Allow for inclusion of online tools and scanned paper documents
6. Ensure compliance with Corporate policies and standards (documentation, records management)
7. Meet requirements for electronic documentation as prescribed by the program staff’s professional college. (i.e. Nursing notes as defined by the College of Nursing, Client Assessment Form.)
8. Enable electronic Signature/user authentication in support of Electronic Documentation

Compliance with Privacy Standards
1. Implement role based access to ensure users can see and access only content required to perform role.
2. Ensure compliance with PHIPA and e-PHIPA - ensure consent for collection of PHI is incorporated into documentation and part of permanent client record.
3. Ensure audit logs of all user interactions with system are logged and accessible
4. Ensure capability to maintain and modify consent conditions and that all changes are tracked and documented
5. Ensure Privacy Impact Assessment completed, risks identified and mitigated and passed

Compliance with Data Security Best Practices & standards
1. Ensure Threat Risk assessment completed and passed
2. Ensure Vulnerability Risk assessment completed and passed
3. Two factor identity authentication process (userID/password and personal security token) that also supports electronic signature for data entry
4. Provide accessible Audit logs and trails
5. Role based security to reflect organizational practice needs
6. Ensure encryption and data storage based on best practice
7. Ensure compatibility with hardware & enforced client hard drive hardening
8. Ensure compliance with Corporate IT Enterprise standards

Enable Integrated Reporting Capabilities
1. Enable immediate access to service, operational and aggregate reporting.
2. Provide integrated Service Reports provide service and customer details required for service delivery
3. Provide integrated Operational Reports for Managers to monitor customer service, planning and forecasting, staff performance and to respond to legal inquiries
4. Ensure availability of aggregated Ad hoc Reports that are responsive to Program specific reporting requirements (via associated DataMart)

<table>
<thead>
<tr>
<th>Operational Adaptability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ensure flexibility so that there is ability to deploy and incrementally</td>
</tr>
<tr>
<td>2. Ensure ability to expand and tailor functionality with minimal business down time.</td>
</tr>
<tr>
<td>3. Ensure ability to adapt to organizational and operational change</td>
</tr>
<tr>
<td>4. Incorporate and implement a strategy for decommissioning legacy systems and data conversion and migration or archival of legacy system data in accessible formats (Requirements for migration of NYNIS/ICRA data to CNCMS where possible)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Responsiveness to operational changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ensure ability to adapt to organizational and operational change Human Resources</td>
</tr>
<tr>
<td>2. Ensure ability to adapt to organizational and operational change System Functionality</td>
</tr>
<tr>
<td>3. Ensure ability to adapt to organizational and operational change Business Data</td>
</tr>
<tr>
<td>4. Ensure ability to adapt to organizational and operational changes in Program Infrastructure (e.g organizational chart, service tree)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Public Health Client Management</th>
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</thead>
<tbody>
<tr>
<td>1. Enable management of customer records for a variety of clients (individuals, families, groups and populations)</td>
</tr>
<tr>
<td>2. Enable integrated case management for Chronic Disease &amp; Injury Prevention Programs, Child Health and Development Programs (reproductive &amp; Infant Health, Child Health services), Healthy Community Programs (School Programs, Substance Misuse Prevention, mental Health, Urban Issues, Vulnerable Adults &amp; Seniors services, Sexual Health Promotion etc.)</td>
</tr>
<tr>
<td>3. Integrate individual and group customer information management (including geographical locations / grouping of information) in support of programs and services and in accordance with privacy/documentation requirements</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>User Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ensure clear design</td>
</tr>
<tr>
<td>2. Ensure harmonized public health focused user interface</td>
</tr>
<tr>
<td>3. Ensure user interface meets accessibility requirements</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mobile Enabled</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ensure system access is mobile and available in a wide range of community settings</td>
</tr>
</tbody>
</table>
2. Ensure mobile solutions provide secure and timely access to client information to ensure quality, comprehensive public health service delivery
3. Mobile solution must be Privacy and Security Compliant
4. Ensure Robust encryption of endpoint devices
5. Ensure there is separation of application from endpoint devices
6. Ensure there is no information stored on endpoint devices
7. Ensure mobile solution is cost-effective solution from a data usage perspective
8. Ensure application is device/Operating system agnostic

**Integration**

1. Utilize federated user Identity management
2. Enable standardized compliant business processes
3. Ensure application processes are supported by policies and procedures
4. Release system within an integrated quality assurance process
5. Ensure systematic data collection processes and tools
6. Ensure development of Data dictionary and standard taxonomy
7. Where possible support integration with centralized authority data sources
8. Interface with other health systems being used by CDIP HC HF programs (e.g. ISCIS)
9. Integration with Coordinated Access Database
10. Provide data Dictionary/centralized glossary
11. Other high level system related requirements (e.g. performance, access, security, service levels, archival & retention, mobility, etc.).

**User Support & Learning**

1. Ensure support can be provided utilizing in house program based “Expert Users”/super users: full time, accessible, on-site, expertise and support
2. Ensure availability of customized training, processes and materials for program users
3. Ensure system is integrated into organizational culture to provide a continuous learning culture and strategy for system users and sustainment resources.
4. Ensure variety of training and learning methods: Peer to peer learning
5. Ensure variety of training and learning methods: Customized training based on function, role or position i.e. Task based orientation
6. Ensure variety of training and learning methods: Formal classroom training
7. Ensure variety of training and learning methods: Self-directed learning

**Users**

1. Enable use of the system by multidisciplinary public health staff (professional and non-professional)
2. Ensure system is adaptable to users with special needs e.g. visual impairment

**Summary Functional Requirements**

1. **CUSTOMER PROFILE:**
   a) **Individual Customer Profile**
      i. Enable ability to collect client name and other name
      ii. Enable customizable Global code value fields (e.g. Gender)
      iii. Ensure capability to capture multiple addresses and phone numbers for clients

1. **CUSTOMER PROFILE:**
   b) **Individual Customer Profile Other detail:**
      i. Where relevant include fields to collect info about Primary Health Care provider.
      ii. Include detail about language
      iii. Include gender global code values in alignment with access and diversity guidelines.

1. **CUSTOMER PROFILE:**
   c) **Family Customer Profile**
      i. For service delivered to a family enable creation of a family service record that links associated members with the service and service documentation.
      ii. Assign all members within a family record defined role e.g. Primary Caregiver (Family ID), Secondary caregiver (optional) and Care recipient(s).
      iii. Ensure family members each have an individual record – to document individual services.
      iv. Enable ability to link Family members present at interactions with the interaction documentation for the service.
      v. Enable search of family Families are searchable via PCG ID of Family ID.
      vi. Ensure that family status is only associated with designated services that are delivered in family context (e.g. HBHC)
### 1. CUSTOMER PROFILE:
#### d) External Organizational (EO) Customer Profile
1. Enable ability to create customer profiles for formal and informal organizations
2. Associate service request for an EO with an agency contact name.
3. **ADDRESS:**
   1. Customer address to include primary address and service address.
   2. Addresses are all Census tract Geo coded for Geo spatial reporting and queue distribution
   3. Customer phone to include primary telephone number and service alt number
4. Ability to link EOs as additional resources on TPH services (e.g. in kind involvement & partnerships)

### 1. CUSTOMER PROFILE:
#### e) Group Profile
1. Enable ability to pre-schedule group series with 1 or many sessions
2. Build Groups to accommodate different customer types: EO Contacts, Registered Individuals (PHI Applies), and Unknown - no registration required, external registered.
3. Enable request handler to search scheduled groups with profile page that provides service details (location, goals, objectives and target audience.
4. Registration to group will link client record to group service allowing attendance tracking and group service documentation.
5. Ensure individual documentation of 1:1 interactions remains secure within Individual record external to group documentation.
6. Unknown groups enable tracking of participation numbers.

### 1. CUSTOMER PROFILE
#### f) Population
1. Enable creation of profile & service record for population interventions e.g. committee/partnership work where audience is population e.g. social marketing campaign, planning work groups.
2. Enable approval process for profile initiation to ensure alignment with strategic goals and assignment of management owner.
3. Link profile and service to objectives and demographic profile for audience.
4. Assign staff lead to service/profile.
v. Enable linkage of multiple staff and external resources to service record/profile for documentation and TAT tracking.

1. CUSTOMER PROFILE:

   g) Address (Individual, Family, External Organization):
   i. Ensure that all customer addresses include primary address and service address.
   ii. Ensure that where possible addresses are all Census tract Geo coded for Geo spatial reporting and queue distribution
   iii. Customer phone to include primary telephone number and service alt number.
   iv. Enable no fixed address and general intersection address options when geo coding or address is not available

1. CUSTOMER PROFILE:

   h) Maintain Profile
   i. Maintain history of all client profiles changes including date, time and user.
   ii. Keep all profile updates historic information.
   iii. Enable modification/update of customer profile from various points in workflow

2. CUSTOMER PUBLIC HEALTH RECORD

   a) Client Service Record
   i. Present all CDIP HC HF services linked to client in order (recent first).
   ii. For each service show service status (queued, assigned, accepted, open, closed).
   iii. Maintain open services within service periods to support e-record retention standards.
   iv. Ensure that service request details are presented (include: request handler, date of request) on all services.
   v. Show service lead on all assigned, accepted, open and closed services.
   vi. Offer 'hover' over Service delivery workers name for easy access to contact information.

3. SEARCH:

   a) Search Customer
   i. Enable search by:
   a. system ID
   b. profile data elements (name, other name, address, telephone, DOB)
   c. Allow for sounds like search
4. REQUEST HANDLING:

a) Service Request Handling
   i. Requests for service shall follow 2 paths.
      a. Closed at HSR for services provided at initial contact a.k.a Telephone call and discharge.
      b. Requests for service provision queued for further service delivery.
   ii. Enable dynamic workflow through request handling process

b) Service Request Documentation (Interaction)
   i. Ensure ability to Track interaction type (e.g. face to face, telephone, fax, email etc.)
   ii. Ensure ability Track Interaction purpose (e.g. initiating service, customer currently receiving service)
   iii. Indicate if interaction s is direct/indirect with client
   v. Ensure that saved documentation not modifiable.
   vi. Enable process to enter additional note when a correction to previously saved notes is required
   vii. Ensure all documentation tagged to user profile and unique user ID.
   viii. Enable ability to add documentation under new date/time stamp.
   ix. Integrate Time and Activity track to attribute to service interactions
   x. Enable key word search where Global Code Value lists are large.
   xi. Enable service pre-screening using screening tools.
   xii. Enable screening override with reasoning.
   xiii. Enable selection of multiple service during 1 request handling session.

c) Service Request Details
   1. Include source type (how did client hear about the service)

d) Consent for PHI (Individual, Family):

   d. Allow for wild card search
   ii. Enable sorting on search return
   iii. Ensure results indicator is presented following search
<p>| | |</p>
<table>
<thead>
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<tbody>
<tr>
<td>i.</td>
<td>Ensure Consent is built into request handling workflow and is mandatory upon creation of new customer profile (individual, family)</td>
</tr>
<tr>
<td>ii.</td>
<td>Ensure ability to modify consent as service proceeds.</td>
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<tr>
<td>iii.</td>
<td>Ensure full record keeping and history is kept for all consent modifications including date, time conditions and user.</td>
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<tr>
<td>iv.</td>
<td>Enable the ability to create lockbox if required.</td>
</tr>
<tr>
<td>v.</td>
<td>Use of standardized global code values for documentation of consent conditions to ensure standard application of consent.</td>
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4. REQUEST HANDLING

e) Unknown Individuals

| i.  | Enable capacity to create Unknown Individual when mandatory profile fields and/or PHI consent conditions are not met |
| ii. | Enable 1 time documentation against unknown individual profile |
| iii. | Enable reporting on unknown customers serviced |

5. QUEUEING:

a) Queue Handling

| i.  | Automatically distribute services to regional offices and appropriate program group through queueing functionality |
| ii. | Queue must be able to manage numerous service statuses (overdue, queued, assigned and transferred) |
| iii. | Tag all services with an ‘accept by’ ‘respond by’ date to ensure that they are dealt with in a timely manner - this is determined by each program based on operational need |
| iv.  | Services that have not been addressed with specified accept by times must automatically be escalated to overdue status and be highly visible on the ‘overdue’ queue tab. |
| v.   | Service that have been assigned must be visible in queue until they are accepted and opened by service delivery staff |
| vi.  | Queue must be used to electronically transfer client files between geographic boundaries. |
| vii. | If staff decline an assigned service they must provide a documented reason for declining service. |
| viii. | Services in queue must be fully traceable |
| ix.  | Declined Services return to the queue for reassignment. |
b) Request/Work distribution

i. Enable multiple methods of queueing Services - Regional Offices
   a. Queue by geography link census tract to program service boundary
   b. Queue manually where request Handler select service delivery worker and
   c. assign to self where request Handler generates service for themselves to do

ii. Validate all automated functions with user interface message

6. WORKLOAD PROFILE:

a) Staff Workload Profile

1. Enable staff to manage all assigned services via a workload profile (In box) - accessible to the staff person
2. Present services in workload profile in priority order assigned (waiting to be accepted), Accepted (waiting to be opened), Opened date order.
3. Once closed services to move out of work load profile and to be accessible via workload History

7. SERVICE RECORD:

a) Client Service record (in Workload Profile)

1. For each opened service for a client create a record that holds documentation and detail specific to the open service and resources assigned to the service.
2. Interactions (Interactions tab): Ensure all documentation entered for the service is presented in a list - by date, include type of interaction, subject line (free form) and documenters name.
3. Enable the generation of referrals easily from existing open services (referral/"service from service") to Fast Track request handling process

7. SERVICE RECORD:

b) Time and Activity Tracking

1. Enable time and activity tracking directly against the service or service interactions
2. Enable non-service time tracking

7. SERVICE RECORD:

c) Assessment Tools

1. Ensure Assessment tool documentation shows name of tool, full name & date of documenter, status.
2. Include multiple tool status: Complete, In Progress, Unable to complete, not assessed.
3. Enable check boxes (multi select), Radio buttons, scoring, free form text

4. Ensure client ID present on tool

5. Enable print copy of tool

### 7. SERVICE RECORD:

#### d) Manage Service Resources

1. Build record level security that ensures Service Lead resource is gate keeper on service.
   
   a. Service Lead has ability to add and remove additional resources.
   
   b. Service lead can close the service.

2. Reports track resource assignments and SL/AR on all services.

### 8. TCHIS Mobile

#### a) Optimization

i. Optimize key functional components of the application to enable full client service in the community

ii. Enable access to open client service record and components (assessment tools, documentation)

iii. Enable entry of service data (documentation, tools, time and activity tracking) into client service record

iv. Ensure data is recorded in database in real time.

v. Enable staff ability to receive accept and open new service requests from the field

vi. Enable ability to refer clients to other services using point of care mobile application.
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