Minnesota Department of Health
Informatics Profiles

An Assessment of Current and Desired Exchange Capabilities and Interoperability of Key MDH Information Systems
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Table of Contents

I. Executive Summary ........................................................................................................ 4

II. Context and Drivers for Interoperability and Modernization of Public Health Information Systems
   Introduction.................................................................................................................. 5
   Nationwide Context: Movement towards Standards-based and Interoperable Public Health Information Systems................................................................. 5
   Minnesota Context: Role of Interoperable Electronic Health Information in Achieving Health Care Transformation......................................................... 6
   Public Health and Minnesota’s 2015 Interoperable EHR Mandate............................... 6

III. MDH Informatics Profiles: Purpose and Methodology
   Purpose....................................................................................................................... 7
   Methodology.............................................................................................................. 8
   Informatics Profile Framework.................................................................................... 8

IV. MDH Informatics Profiles: Results ........................................................................... 10
   A. Current Information Exchange with Partners....................................................... 10
   B. Desired Exchange Partners Internal and External to MDH................................. 11
   C. Current Exchange within MDH........................................................................... 12
   D. Desired Exchange Partners within MDH............................................................. 13
   E. Interoperability Assessment.................................................................................. 14
   F. Standards............................................................................................................... 15
   G. Barriers to Information Exchange......................................................................... 16
   H. Resources Needed for Exchange........................................................................... 18

V. MDH Informatics Profiles: Discussion and Recommendations .............................. 19

VI. Appendices
   Appendix A: Minnesota Model for Interoperable Electronic Health Records............ 25
   Appendix B: List of Selected Programs at the Minnesota Department of Health ......... 26
   Appendix C: Synopsis of Profile Questionnaire.......................................................... 28
   Appendix C: Summary of Key Data Exchange, Standards and Interoperability Elements... 29
   Appendix D: Current Information Exchange with Partners.......................................... 35
   Appendix E: Desired Exchange Partners: Interest of MDH Systems in Linking, Merging, or Exchanging Electronically with Other Data Sets/Systems..................... 36
   Appendix F: Barriers and Resource Needed to Being Able to Exchange Information at Higher Interoperability Levels................................................................. 37
I. Executive Summary

The collection and use of quality health information is integral to the mission and operations of Minnesota Department of Health (MDH). MDH has numerous important information systems that collect, store and use individual and population-based data for public health functions such as disease surveillance, maternal and child health, and vital statistics.

Inventorying the datasets and the information systems has been done sporadically over the years. Given the growing needs for better electronic exchange with data partners and expectations of bidirectional exchanges with the clinical sector, there is a compelling business need for MDH to conduct a current state assessment of key information systems to better understand exchange capabilities and utilization of standards and to create plans for progress towards improved exchange capabilities.

The MDH informatics profile project was conducted to better understand the exchange capabilities and needs of key MDH information systems. The MDH Center for Health Informatics and Health Promotion and Chronic Disease Division collaborated to create an informatics profile of selected information systems that are used for public health activities in Minnesota. This effort identified the needs of current information systems to better support public health practice, to allow for electronic exchange of information, and to aid in planning efforts to modernize public health information systems to become more standards-based and interoperable.

The purpose of the MDH Informatics Profile project was to capture a current state assessment of twenty key MDH information systems that manage personal health information and to assess:

- High level functionality of public health information systems at MDH with special emphasis on exchange capabilities and utilization of standards
- Barriers and future opportunities for how these information systems can be modernized to become more interoperable with exchange partners.

Several themes were identified including the following:

- There is high variability of interoperability levels both between information systems and within any particular information system. Often interoperability is limited by the capabilities of exchange partners
- There is a strong desire at MDH to improve exchange capability with exchange partners, but many challenges exist including limitations of exchange partners and various resource needs within MDH (including funding, staff, staff skill set).

The results identified the need for MDH to work in a coordinated approach to system enhancements toward better integration and interoperability both within MDH and external to MDH with private exchange partners. Several needs were identified including:

- An agency-wide coordinated integration and interoperability plan
- A business plan for prioritizing system improvements
- Support from executive leadership at MDH; and
- Designation of lead personnel or a team to oversee integration and interoperability efforts at MDH.
II. Context and Drivers for Interoperability and Modernization of Public Health Information Systems

Introduction
The collection and use of quality health information is integral to the mission and operations of Minnesota Department of Health (MDH). MDH has numerous important information systems that collect, store and use individual and population-based data for public health functions such as disease surveillance, maternal and child health, and vital statistics.

Inventorying the datasets and the information systems has been done sporadically over the years. Given the growing needs for better electronic exchange with data partners and expectations of bidirectional exchanges with the clinical sector, there is a compelling business need for MDH to conduct a current state assessment of key information systems to better understand exchange capabilities and utilization of standards and to create plans for progress towards improved exchange capabilities.

One of the goals of MDH is to ensure maximum coordination and effective use of the data collected. The MDH Informatics Profiles project is one of the first steps in addressing that goal. In addition, the MDH Informatics Profiles project supports the MDH Information Technology Strategic Map:
1. Strengthening Information Stewardship
2. Enhance IT Systems
3. Improve the Ability to Electronically Exchange Data
4. Strengthen IT Governance and Organizational Capacity

Nationwide Context: Movement towards Standards-based and Interoperable Public Health Information Systems
The national public health informatics agenda, including efforts by the Centers for Disease Control and Prevention Public Health Information Network (CDC PHIN), the Public Health Informatics Institute, the Association of State and Territorial Health Officials (ASTHO), and the National Association of County and City Health Officials (NACCHO) are promoting a movement towards modernizing public health information systems, as a core component to the public health infrastructure, to be more standards-based and interoperable.

This movement towards modernizing public health information systems is also occurring in the context of e-Health nationwide. The national eHealth Initiative, whose mission is to drive improvement in the quality, safety, and efficiency of healthcare through information and information technology, has offered national leadership on the role of health information technology in health care reform. Public health is one of the many sectors included in their vision for improving population health through information exchange between the clinical sector and the public health sector. A few local efforts, including those in Indiana, Washington, and New York (city and state), have already begun including public health in a two-way exchange with private providers.
Minnesota Context: Role of Interoperable Electronic Health Information in Achieving Health Care Transformation

The adoption and effective use of electronic health information systems can play a significant role in transforming the health care system and in supporting healthier communities\(^1\). Governor Pawlenty and the Minnesota Legislature recognize the critical role e-health can play in supporting health care transformation through more effective use of information—including the timely exchange of information—to improve the quality and safety of care, access, and to help control costs. Adoption and effective use of interoperable electronic health records systems and other health information technologies are one of the strategies for achieving these goals.

This is reflected in several significant statutory changes and mandates that were enacted in the 2007 legislative session:

- A mandate that all hospitals and healthcare providers have an interoperable electronic health records system by the year 2015 (Minnesota Statutes 2007, section 62J.495)
- A requirement to develop a statewide implementation plan to meet the 2015 interoperable EHR mandate
- The requirement to establish uniform health data standards by 2009.

In 2008, additional requirements pertaining to e-Health were added as part of health care reform legislation:

- Advancing the use of health information technology by requiring that all prescriptions be ordered electronically by 2011
- Enhancing health care quality, patient safety and Minnesota’s ability to achieve interoperable electronic health records by ensuring that providers use nationally-certified electronic health record systems when available.

Public Health and Minnesota’s 2015 Interoperable EHR Mandate

This 2015 mandate for interoperable electronic health records applies to public health both as a provider of health care and as a receiver of client-based information from healthcare providers and impacts MDH, the Minnesota Department of Human Services (DHS) and local governments, which provide public health services in all 87 of Minnesota's counties and in 4 metropolitan cities.

Along with other stakeholders, MDH must be capable of electronically exchanging information with private providers, hospitals and other private sector partners, either for purposes of ensuring continuous care, receiving electronic disease reports, quality reporting, or other population health assessment. MDH is one of the units of government that is statutorily responsible for measuring the health status of the population. The information needed to carry out these responsibilities will increasingly be available only electronically. \textit{There is a compelling need for all public health to be making progress towards meeting the mandate, starting now because it can take years to plan and implement an interoperable information system successfully.}

The Minnesota e-Health Initiative\(^2\), a public-private collaborative, has developed a statewide implementation plan \(^3\) for universal adoption of interoperable electronic health records (EHRs) in

\(^1\) From Minnesota’s Health Reform Initiative, 2008.
\(^2\) Minnesota e-Health: \url{http://www.health.state.mn.us/e-health/}
\(^3\) Statewide Implementation Plan, 2008 edition: \url{http://www.health.state.mn.us/ehealth/ehrplan.html}
Minnesota and has included a special section pertaining to public health. The plan presents the *Minnesota Model for Interoperable EHRs* (refer to Appendix for full model) which recognizes public health as an integral part of e-Health.

**Figure 1: Minnesota Model for Adopting Interoperable Electronic Health Records**

Every health care provider in Minnesota needs to be making progress through these seven steps. Regardless of where an organization is on the continuum, it must continue moving further to the right, toward effective use and interoperability. All organizations, including public health organizations, should determine where they are on this continuum.

*One of the priorities for e-Health in Minnesota was identifying which state and local public health information systems are in most need of modernizing to meet the 2015 mandate.* The MDH Informatics Profile project was developed to assist in the initial assessment of key MDH systems.

**III. MDH Informatics Profiles: Purpose and Methodology**

**Purpose**

The MDH Center for Health Informatics and Health Promotion and Chronic Disease Division collaborated to create an informatics profile of selected information systems that are used for public health activities in Minnesota. This effort identified the needs of current information systems to better support public health practice, to allow for electronic exchange of information, and to aid in planning efforts to modernize public health information systems to become more standards-based and interoperable.

The purpose of the MDH Informatics Profile project was to capture a current state assessment of key public health information systems that manage personal health information and to assess:

- High level functionality of public health information systems at MDH with special emphasis on exchange capabilities and utilization of standards
- Barriers and future opportunities for how these information systems can be modernized to become more interoperable with exchange partners.
**Methodology**

Data collected as part of inventory project by MDH in 2003 provided a baseline of information which was analyzed and synthesized to create logical groupings of data sets (e.g., by public health focus area). The analysis identified approximately 150 data sets. The data sets were further sub-categorized into ones holding person name level information (83 data sets). There were approximately 60+ data sets which fulfilled e-Health and Common Ground criteria.

Public health information systems at MDH were included if they contained personal health information and were used for core public health (vs. administrative) functions or if they were used for a core purpose in chronic disease but to not contain personal health information (e.g., Stroke Registry). Using these criteria, 20 information systems of interest were identified. This list was then validated with subject matter experts from the department.

Systems excluded from the profile project included environmental health-related systems and survey systems (e.g., the Behavioral Risk Factor Surveillance System). These systems were excluded because they do not collect personally-identifiable health information.

The twenty MDH Information Systems were grouped according to primary public health area as shown in Table 1. A list of information systems included in these public health areas is presented in Appendix.

<table>
<thead>
<tr>
<th>Public Health Area</th>
<th>Number of MDH Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Disease</td>
<td>8</td>
</tr>
<tr>
<td>Maternal and Child Health</td>
<td>4</td>
</tr>
<tr>
<td>Chronic Disease</td>
<td>3</td>
</tr>
<tr>
<td>Injury</td>
<td>2</td>
</tr>
<tr>
<td>Vital Statistics</td>
<td>1</td>
</tr>
<tr>
<td>Laboratory</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>20</strong></td>
</tr>
</tbody>
</table>

Interviews with programmatic and technical staff were conducted to collect the information to create the MDH Informatics Profiles.

**Informatics Profile Framework**

Previous efforts at MDH emphasized information on data sets, while the current effort aimed to expand the collection to emphasize partners in data collection (including where data comes from and how it is collected), information system applications to support the flow of data to/from MDH, and partners in data reporting (including where data goes and how it is sent).

The profile questionnaire was based on the informatics profile framework presented in Figure 2. A one page synopsis of the profile questionnaire is also included in the Appendix.

Details on information exchange including information content, standards, current level of interoperability and plans for progress were collected. Information on standards included...
messaging, vocabulary and readiness for standards adoption including opportunities and barriers (see Figure 2). The profile also assessed levels of interoperability based on the National Alliance for Health Information Technology definitions, from Level 1 (non-electronic data) to Level 4 (machine interpretable data).

**Figure 2: Conceptual Framework of Informatics Profile**

<table>
<thead>
<tr>
<th>Data Partners</th>
<th>Minnesota Department of Health Information Systems</th>
<th>Data Partners</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Data Collection by MDH)</td>
<td>Includes infrastructure, data sets and applications. Focus on applications, data input, data output, exchange capabilities and utilization of standards in an information system.</td>
<td>(Data Recipients from MDH)</td>
</tr>
</tbody>
</table>

**IV. MDH Informatics Profiles: Results**

The analysis of the data revealed a strong desire (100%) by programs to improve exchange capabilities with their stakeholders. The data also indicated great variability in MDH information systems as it relates to exchange capabilities, interoperability levels, readiness for exchange, and barriers/opportunities for system modernization. The following pages present more of the results in detail.
V. MDH Informatics Profiles: Results

The analysis of the data revealed a strong desire (100%) by programs to improve exchange capabilities with their stakeholders. The data also indicated great variability in MDH information systems as it relates to exchange capabilities, interoperability levels, readiness for exchange, and barriers/opportunities for system modernization. The following pages present more of the results in detail.

A. Current Information Exchange with Partners

There are a lot of similarities in the types of information exchange partners MDH systems have, with the top exchange partners being hospitals, private providers, CDC, MDH (other programs within MDH), Local Public Health, labs, and other state agencies (not DHS). Less common exchange partners include: DHS, individuals, other Federal agencies, long-term care facilities, other states, health plans/payers, medical examiners, schools, law enforcement, vital registrars, and pharmacies.

Figure 3: Current MDH Information Exchange Partners
B. Desired Exchange Partners Internal and External to MDH

While there is a diverse range of current information exchange partners, there is an equally diverse range of desired exchange partners both internal and external to MDH. Those include private providers, other programs within MDH, hospitals, DHS and other state agencies, Local Public Health, labs, and CDC and other Federal agencies.

This graph denotes the desired exchange partners (either through better integration or interoperability with other systems). There is a great desire for better interoperability with private providers and hospital, especially through their EHR systems. In addition, there is a great interest in better integration within MDH on related systems (e.g., better integrated child health systems).

Figure 4: Desired Information Exchange Partners
C. Current Exchange within MDH

Few MDH information systems link, merge, or exchange data internally with other systems. Vital Statistics is the most common system that MDH currently links with. The figure below depicts current efforts to link, merge, or exchange data with other MDH systems.

Figure 5. Current Information Exchange Partners within MDH
D. Desired Exchange Partners within MDH

While there are few systems that currently link, merge, or exchange data, there is a strong desire for this capability with other MDH information systems. The figure below is a pictorial representation of the various MDH systems and their expressed interest in being able to exchange information with other programs. There is significant interest at MDH to being able to link or exchange data between systems when appropriate; however, few plans are in place to do so.

Figure 6: Desired Information Exchange Partners within MDH

*Note: the arrows depict interest in being able to link, merge, or exchange information, not current status.
E. Interoperability Assessment

Interoperability was categorized into current use and planned/capability levels for the systems in four incremental changes in interoperability based on the National Alliance for Health Information Technology definition. This information was self-reported for each of the systems based on current use of their system (including current exchange partners) and does not represent interoperability with future/ideal exchange partners – as those numbers would be lower.

- The systems that currently are at a level 4 interoperability (highest level) or will be so by the latter half of 2008 include WIC (financial transactions only), BLIS, MIIC, LIMS, and MCSS
- The systems that are currently at a level 3 interoperability include Refugee Health, STD Infonet, eHARS, Trauma registry, TBI, stroke registry, MEDSS (with planned system upgrades to increase interoperability), Vital Records (with planned system upgrades to increase interoperability), and WIC (non-financial transactions).

Based on the current profile of systems, there is great variability at MDH as it relates to current system interoperability levels. Some systems are currently operating at a high interoperability level or have plans in the near future (based on current modernization plans), but many systems are far from achieving a level 4 interoperability. And nearly all systems have a wide range of interoperability levels, primarily based on capabilities of their exchange partners. Table 2 represents the current highest capability of the MDH information systems.

Table 2: Interoperability of MDH Information Systems

<table>
<thead>
<tr>
<th>MDH System Interoperability Level</th>
<th>Number Current Capability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1  Non electronic data (paper, mail, phone)</td>
<td>4</td>
</tr>
<tr>
<td>Level 2  Machine transportable data (fax, e-mail, unindexed documents)</td>
<td>4</td>
</tr>
<tr>
<td>Level 3  Includes web-based interface and FTP uploads. Human action required.</td>
<td>8</td>
</tr>
<tr>
<td>Level 4  No human action required. Machine to machine exchange of data (structured messages, standardized content), including HL7 messages</td>
<td>4*</td>
</tr>
</tbody>
</table>

*In process, will increase by 1 in Fall 2008

Interoperability levels are adapted from the National Alliance for Health Information Technology definition and based on self-assessment of current system use including current exchange partners. The numbers do not reflect future or desired exchange partners/sources (e.g., EHRs), and the numbers only reflect current capability level with one or more exchange partners.
F. Standards

Standards related to both exchange and representation of data was gathered. Figure 7 depicts the data exchange between heterogeneous applications and the role of standards. Data translation tools are necessary when standards are not used and their need increases exponentially based on the number of applications that need to exchange data.

**Figure 7: Data Exchange between Heterogeneous Applications**

Six (30%) of the systems profiled are currently using HL7 standards with one-fifth more planning to use standards for exchange. Five (25%) of systems use PHIN-MS standard for transport and 4 (20%) of systems are considering using the standard.

The exchange standards were mostly used for lab data. Half of the systems currently do not use exchange standards.

Data representation standards for certain fields were being used in 14 systems (70%). CDC provided codes were used for representation in 4 systems and 2 systems currently do not use any standards/codes for representation of data.

**Table 3: Utilization of Standards**

<table>
<thead>
<tr>
<th>Standards for Exchange of Data</th>
<th>Standards for Representation of Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>National standards for certain fields</td>
<td>14 systems (70%)</td>
</tr>
<tr>
<td>Only use CDC provided codes</td>
<td>4 systems (20%)</td>
</tr>
<tr>
<td>No standards/codes are used</td>
<td>2 systems (10%)</td>
</tr>
<tr>
<td><strong>Exchange Format: HL7 Standards</strong></td>
<td><strong>PHIN-MS Transport</strong></td>
</tr>
<tr>
<td>Current use: 6 systems (30%)</td>
<td>Current use: 5 systems (25%)</td>
</tr>
<tr>
<td>Future plans: 4 systems (20%)</td>
<td>Future plans: 4 systems (20%)</td>
</tr>
<tr>
<td>No plans yet: 10 systems (50%)</td>
<td>No plans yet: 11 systems (55%)</td>
</tr>
</tbody>
</table>
G. Barriers to Information Exchange

Many barriers to being able to electronically exchange information at interoperability levels 3-4 were identified, with the most frequent barrier being lack of resources. **17 out of 20 programs (85%) mentioned lack of resources as a barrier to efficient exchange of information.**

Other barriers mentioned frequently include:

**Lack of understanding of what needs to be done**
Nearly half of the systems interviewed (45%) state that they aren’t sure what would need to be done to be able to electronically exchange information at interoperability levels 3-4 with their exchange partners. This high rate identifies the need for improved communication and leadership across MDH about agency plans and resources available for modernizing key information systems and potentially calls for a new set of workforce skills that may be required of staff responsible for modernizing these systems.

**Various data streams/information systems based on funding**
Many respondents (40%) identified that the many data streams/information systems they work with is one of their barriers to being able to electronically exchange information at interoperability levels 3-4 with their exchange partners. For example, a system that is provided by another entity, such as CDC, may have additional limitations on how the system can be upgraded.

**Lack of standards**
Many respondents (40%) identified the lack of available standards as a barrier to being able to electronically exchange information at interoperability levels 3-4 with their exchange partners. While standards are being developed/harmonized for certain use cases at the national level, this response also points to the need for more communications/education in this area.

**Lack of management/IT support to make this a priority**
While it was not the most common barrier, a few respondents (30%) identified the lack of management and/or IT support to make this a priority. Frequently, this was due more to competing priorities rather than a lack of interest in improved exchange capabilities.

**Lack of interest/perceived need by team**
Few respondents (15%) stated that the lack of interest or perceived need by their team was one of their barriers to being able to electronically exchange information at interoperability levels 3-4 with their exchange partners.

**Other barriers**
Many respondents (40%) identified other barriers to being able to electronically exchange information at interoperability levels 3-4 with their exchange partners which included:
- Lack of unique personal identifier across systems
- Limitations in capabilities of exchange partners (e.g., local public health, providers)
- Lack of interoperability and difficulty coordinating with internal and external exchange partners (e.g., many silo systems that are not connected)
- Benefits of enhanced systems are difficult to communicate
- Political constraints.
Figure 7: Barriers to Exchanging Information and Higher Interoperability Levels

Lack of understanding of what needs to be done
Various data streams/ information systems based on funding
Lack of standards
Other
Lack of Management/ IT support to make this a priority
Lack of interest/ perceived need by team

17 out of 20 programs (85%) mentioned lack of resources as a barrier to efficient exchange of information.
H. Resources Needed for Exchange

The resource needed by most of the information systems (80%) is well-defined policies in place with regards to information exchanges. This was followed by need for additional resources in form of funding, staff etc. More than half of the information systems felt the need for well-crafted information sharing agreements which can guide data exchanges, and 40% of information systems identified standards as a resource need to facilitate the move forward towards better electronic exchanges and interoperability.

Many information systems cited other resources needed including:
- An agency wide strategic plan for interoperability, coordinated unified approach, plan for implementing PHIN-MS
- The development of a master client index
- Political support, political will, and agency commitment from the top
- Getting providers to have the capability to send HL7 messages
- Political clarifications on who has access to data and what permissions to disclose
- Adequate IT staff located within their programs.

Figure 8: Resources Needed for Exchanging Information at Higher Interoperability Levels
V. MDH Informatics Profiles: Discussion and Recommendations

As a result of the MDH Informatics Profile project data collection, several agency-wide gaps have been identified, particularly around the strong desire of many MDH information systems to develop the capability to exchange data electronically with a complex array of exchange partners. As a result, there are a significant number of MDH information systems with a sizeable need for modernization. The following are a set of recommendations based on synthesis of the data to support the need for a coordinated information system modernization effort at MDH.

A. Commit to a Project to Address MDH Integration and Interoperability Issues

Strategic and tactical planning around interoperability is needed to comply with the requirements of the 2015 interoperable EHR mandate and also to meet the increasing expectations around public health to have better electronic exchange capabilities and bidirectional communications with EHRs, local public health, and other frequent MDH exchange partners.

Creation and execution of an interoperability plan needs buy-in from executive leadership to address the identified barriers, secure and allocate needed resources and be a strong support and proponent for interoperability.

To modernize its many information systems, and to meet Minnesota’s 2015 interoperable EHR mandate, the department will need to make significant and on-going financial, staffing and organizational resource commitments, which are similar to EHR investments made in the private sector. But, if done right, it will improve services offered by MDH, save money and be transformational in how MDH uses and exchanges information to create healthier families and communities.

Many of these needs and recommendations were identified in the 2008 Edition of “A Prescription for Meeting Minnesota’s 2015 Interoperable Electronic Health Record Mandate: A Statewide Implementation Plan,” calling out for the need for public health to work collaboratively to modernize our public health information systems. The data collected through the MDH Informatics Profile project further support the recommendations from the 2008 report. At MDH, executive leadership is needed to support:

- A collective business and resource plan for modernizing information systems to meet new specifications
  - Including plans for developing the capacity to support standardized electronic messages (implement and support the HL7 messaging standard)
- Plans for identifying funding and work with the Minnesota Legislature, local elected officials and other potential funders to allocate needed resources for information system development and modernization
- Plans that promote joint local–state collaboration for advancing integration and interoperability of public health information systems (to be credible and contributing partners in the emerging transformation of health care, MDH needs to partner with DHS and local health departments)
Taking a coordinated, enterprise-wide approach to decisions such as standards adoption, overall architecture issues related to interoperability such as choice of secure data transport, and to funding

- Enabling linkages and integration of data across systems where allowed by law, particularly for programs serving the same population, such as child health
  - An implementation plan for increasing informatics knowledge and skills across the workforce so that staff can effectively use information and information systems to measure and improve population health.

### B. Designate Lead Personnel or a Team to oversee Integration and Interoperability Issues at MDH

The scale of plans and projects needed to move towards efficient data exchanges and data management means that sufficient and ongoing resources will be required to implement them effectively. When a clinic or hospital implements an EHR system, it requires hiring knowledgeable consultants, re-tasking staff to work on project teams, providing significant senior leadership engagement and support, ensuring effective project management, and having the finances in place. It is no different for public health.

Having a designated lead personnel/team will help to move this forward by:
- Presenting a credible level of preparedness for integration (internal) and interoperability (external) exchange to stakeholders, policy makers and funders
- Increasing awareness for existing projects helping create opportunities for collaboration
- Identifying needs related to informatics competencies
- Collaboratively defining business processes, information systems and infrastructure specifications needed for systems to be more standards-based and interoperable
- Identifying other information systems with which information must be exchanged, such as clinical care, health plans and correctional health
- Adopting recommended data and messaging standards in order to be interoperable with other systems
- Collaboratively identifying what information needs to be collected and exchanged in order to carry out those business processes.

### C. Create an MDH Integration and Interoperability Plan

The MDH Informatics Profiles project identifies a need for coordinated plan for integration and interoperability at MDH, including integration within MDH and interoperability with external exchange partners. Many MDH systems desire greater interoperability, but feel the need for department-wide effort and a lead at MDH to champion a plan for interoperability (as many systems don’t know what to do or feel it would take too much effort). In addition to the technical architecture, a clearly defined business architecture plan that defines the business needs and desired functionalities should be created to support the changing needs of the agency in regards to integration and interoperability.

Advancing integration and interoperability at the departmental level present many agency-wide benefits including:
- Increasing efficiencies by eliminating the need to log into, query and enter data into multiple, non-interoperable information systems for the same individual. Staff time spent on double entering data—and ensuring consistent and accurate demographic information across systems—is time not spent in delivering public health services.
- Utilizing opportunities to protect the public’s health with abilities to generate reports at the population/community level in ways that integrates information on health status or risks.

Since many of MDH’s information systems exchange with the private health care sector, the capability to exchange electronically through EHRs is becoming increasingly important, especially as the 2015 mandate for interoperable EHRs becomes near. The value of an interoperable EHR depends in part on other providers/exchange partners in the community also having interoperable systems, including public health. EHRs have the ability to facilitate bidirectional communications and exchanges with many data systems. Public health and other information systems will need to exchange information electronically with EHRs, both to ensure quality of care and to meet their respective business needs into the future.

The need and drivers for this approach include:
- Many MDH systems exchange client-level health information to stakeholders, but there is generally limited capability to exchange at a high level of interoperability (with just a few systems doing this for selected set of transactions)
- Many MDH systems desire to exchange different or additional information from various stakeholders (often within MDH or through EHRs) but few have plans in place to do so
- Systems that do exchange at a high interoperability level are limited by the capabilities of their current exchange partners (of which there is considerable of variability), and this higher level of interoperability represents the current system/exchange partners NOT potential future system/desired exchange partners
- Some systems are also at a low level of interoperability, but they don’t have a business need for a higher level of interoperability, so some mechanism needs to prioritize systems with greatest need/cost benefit
- Significant progress is already being made with the successful procurement of resources for the development of the Minnesota Electronic Disease Surveillance System Project (MEDSS). Future opportunities for integration should consider MEDSS as a model for integrating systems within MDH when appropriate
- Developing a plan for integration and interoperability at MDH also consistent with MDH’s plan for a service-oriented architecture, building upon existing services, so that similar processes do not need to be repeated in applications across MDH (e.g., HL7 services).

**D. Establish a Business Plan for Prioritizing System Improvements**

Recognizing that there will be limited resources for funding the various upgrades that will be needed for greater integration and interoperability, a business plan with a defined scope must be developed in order to prioritize system improvements.

One option to consider is to adopt the recommendations of the Minnesota e-Health Initiative which evaluated a wide range of opportunities for health information exchange that could lead
to improvements in population health. These recommendations could be used as a starting point for identifying modernization opportunities and needs within MDH.

Out of that analysis, five areas were identified to focus initial modernization efforts:

- Reportable diseases screening and surveillance (electronic submission of required disease reports)
- Immunizations (2-way, real time exchange between EHRs and the statewide immunization registry)
- Laboratory result reporting
- Chronic disease management
- Maternal and child health risk factors

Additional information on opportunities for exchange and information systems to be modernized are available at: (www.health.state.mn.us/ehealth).

E. Promote Active Involvement in National Informatics and Standards Setting Activities

One of the more concrete ways individual programs can become prepared for better interoperability and integration of systems is to participate whenever possible on various national standards setting activities. Potential opportunities are listed below.

- CDC (Centers for Disease Control and Prevention)
  http://www.cdc.gov
  o Participate in CDC Community of Practice
    ▪ PHIN (Public Health Information Network) Communities of Practice
      http://www.cdc.gov/phin/communities/phin-cop-descriptions.html

- AMIA (American Medical Informatics Association)
  http://www.amia.org
  o Utilize educational opportunities on public health / population informatics
  o Participate in AMIA Public Health Informatics Working Group
    http://mailman.amia.org/mailman/listinfo/phi-wg

- AHIC (American Health Information Community)
  http://www.bhs.gov/healthit/community/background/
  o Participate in AHIC work groups
  o Provide feedback to AHIC Use Cases / Utilize harmonized Use Cases
    ▪ Three public health related Use Cases to date [Newborn Screening Use Case (2009), Public Health Case Reporting (2008), Immunizations and Response Management (2008)]

- Healthcare Information Technology Standards Panel (HITSP)
  http://www.hitsp.org/
  o Participate in HITSP Technical Committees
  o Participate in demonstrations to implement and test HITSP interoperability standards

- Other resources
  o Public Health Data Standards Consortium
    http://www.phdsc.org
Health Level 7 - one of several American National Standards Institute (ANSI) - accredited Standards Developing Organizations (SDOs) in the healthcare arena. [http://www.hl7.org](http://www.hl7.org)

- Participate in Public Health and Emergency Response workgroup

In the long run, it will be advantageous for individual programs to stay current on informatics issues related to public health and on the national standards being set, as well as to participate in the process whenever it is appropriate.

**F. Address Privacy, Confidentiality, and Security of Data when Information Exchange is Involved**

Individual’s privacy protections are paramount in the exchange of personal health information. Strong security measures, uniformly implemented, are essential to success. The Minnesota Department of Health should facilitate a coordinated policy effort to identify how to balance interoperability and exchange for the sake of improving public health. Any plans regarding integration and interoperability at MDH must assure that MDH complies with all laws regarding privacy of confidential information, such as personal health information.
VI. Appendices

- Appendix A: Minnesota Model for Interoperable Electronic Health Records
- Appendix B: List of Selected Programs at the Minnesota Department of Health
- Appendix C: Summary of Key Data Exchange, Standards and Interoperability Elements
- Appendix D: Current Information Exchange with Partners
- Appendix E: Desired Exchange Partners: Interest of MDH Systems in Linking, Merging, or Exchanging Electronically with Other Data Sets/Systems
- Appendix F: Barriers and Resource Needed to Being Able to Exchange Information at Higher Interoperability Levels
Appendix A
Minnesota Model for Interoperable Electronic Health Records

Adopting Interoperable Electronic Health Records

Continuum of EHR Adoption

<table>
<thead>
<tr>
<th>Adopt</th>
<th>Utilize</th>
<th>Exchange</th>
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<tbody>
<tr>
<td>Assess</td>
<td>Implement</td>
<td>Readiness</td>
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<tr>
<td>Plan</td>
<td>Effective Use</td>
<td>Interoperate</td>
</tr>
<tr>
<td>Select</td>
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</tbody>
</table>

Achievement of 2015 Mandate

What strategies will shorten these lines and help move them to the right?

Large Hospitals
Small Hospitals
Radiology
Pharmacies
Primary Care Clinics
Nursing Homes
Local Health Departments

Estimated range of adoption based on various surveys and other sources

Minnesota Department of Health, February 2008
# Appendix B
## List of Selected Programs at Minnesota Department of Health*

<table>
<thead>
<tr>
<th>#</th>
<th>INFORMATION SYSTEMS ORGANIZED BY MDH DIVISON</th>
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<tbody>
<tr>
<td><strong>Community and Family Health</strong></td>
<td></td>
</tr>
</tbody>
</table>
| 1 | WIC MIS (Women, Infants and Children Management Information System)  
http://www.health.state.mn.us/divs/fh/wic/ | |
| 2 | Newborn Hearing Screening / Early Hearing Detection and Intervention (EHDI)  
http://www.health.state.mn.us/divs/fh/mch/unhs/ | |
| **Environmental Health** | |
| 3 | Birth Defects Information System (BDIS)  
http://www.health.state.mn.us/divs/eh/birthdefects/index.html | |
| 4 | Blood Lead Information System (BLIS)  
http://www.health.state.mn.us/divs/eh/lead/surv/index.html | |
| **Infectious Disease Epidemiology, Prevention and Control** | |
| 5 | MEDSS (Minnesota Electronic Disease Surveillance System)  
http://www.health.state.mn.us/divs/idepc/index.html | |
| 6 | MIIC (Minnesota Immunization Information Connection)  
http://www.health.state.mn.us/divs/idepc/immunize/registry/index.html | |
| 7 | Refugee Health  
http://www.health.state.mn.us/divs/idepc/refugee/index.html | |
| 8 | STD Surveillance (STD infonet)  
http://www.health.state.mn.us/divs/idepc/dtopics/reportable/std.html | |
| 9 | HIV Surveillance (eHars)  
http://www.health.state.mn.us/divs/idepc/diseases/hiv/hivstatistics.html | |
| 10 | STD MIS  
http://www.health.state.mn.us/divs/idepc/dtopics/stds/index.html | |
| 11 | Health Threat  
http://www.health.state.mn.us/divs/idepc/stdhivsection.html | |
| 12 | Infected Healthcare Workers  
http://www.health.state.mn.us/divs/idepc/stdhivsection.html | |
<table>
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<tr>
<th>#</th>
<th>Health Policy</th>
<th>Health Promotion and Chronic Disease</th>
<th>Public Health Laboratory</th>
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</thead>
<tbody>
<tr>
<td>13</td>
<td>Vital Statistics System</td>
<td>MCSS (Minnesota Cancer Surveillance System)</td>
<td>LIMS (Laboratory Information Management System)</td>
</tr>
<tr>
<td>14</td>
<td>Trauma Registry</td>
<td>Sage Tracking and Follow-up System (CVD and Breast/Cervical Cancer Screening program)</td>
<td>Newborn Screening Registry</td>
</tr>
<tr>
<td>15</td>
<td>TBI (Traumatic Brain and Spinal Cord Injury) Registry</td>
<td>Stroke registry</td>
<td></td>
</tr>
</tbody>
</table>

* Selected programs with informatics components
Appendix C: 
Synopsis of Questionnaire

I. DESCRIPTION AND PURPOSE
   - Name
   - Purpose
   - Estimated records in systems
   - Approximate number of transactions
   - Users of system
   - Accessibility from internet
   - Vendor support/maintenance
   - System functionalities
   - Details on information flow

II. INFORMATION COLLECTION AND REPORTING
   - Type of information received / reported
   - Inclusion of personal health information in data exchanges
   - Sources / receivers of data
   - Exchange methods
   - Standards for exchange

III. DATA REPRESENTATION AND INTEGRATION
   - Local / national coding standards used
   - Details on merging / linking information from different sources

IV. INFORMATION SYSTEM INTEROPERABILITY
   - Interoperability Capabilities
     Interoperability: the ability of different information technology systems and software applications to communicate, to exchange data accurately, effectively, and consistently, and to use the information that has been exchanged.
     • Current Use Interoperability Level
     • Current Interoperability Capability Level

V. FUTURE NEEDS FOR INTEROPERABILITY
   - Details on needs / wishes for information exchanges at higher interoperability
   - Plans to modernize the information system to better enable electronic exchange with partners
   - Barriers to exchange information electronically at interoperability levels 3 or 4
   - Resources and technical capabilities needs to exchange information electronically at interoperability levels 3 or 4
## Appendix C:
### Summary of Key Data Exchange, Standards and Interoperability Elements

<table>
<thead>
<tr>
<th>System Name</th>
<th>Exchange Partners (Information Collection)</th>
<th>Exchange Partners (Information Reporting)</th>
<th>Electronic Data Exchange (Data Collection)</th>
<th>Electronic Data Exchange (Data Sending)</th>
<th>Exchange Methods</th>
<th>Standards: Exchange</th>
<th>Standards: Representation</th>
<th>Interoperability: Current Use</th>
<th>Interoperability: Current Capability</th>
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<tbody>
<tr>
<td><strong>Community and Family Health Division</strong></td>
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</tr>
<tr>
<td>1. WIC MIS</td>
<td>Local Public Health, tribes, MDH</td>
<td>USDA, CDC, Local Public Health, tribes, MDH, banking agent</td>
<td>100% electronic</td>
<td>100% electronic</td>
<td>Secure FTP site; flat file transfer; web based application for look-up and ad-hoc reporting.</td>
<td>ANSI ASC X12N HL7 (future)</td>
<td>As established by CDC and USDA.</td>
<td>Level 3-4</td>
<td>Level 4</td>
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<tr>
<td>2. EHDI</td>
<td>Providers, Schools, Local Public Health (sometimes)</td>
<td>Providers, Schools, Local Public Health (sometimes)</td>
<td>0% electronic</td>
<td>Fax, mail, voice</td>
<td>None</td>
<td>ICD codes, DSM codes (for mental health)</td>
<td>Level 1</td>
<td>Level 1</td>
<td></td>
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<tr>
<td><strong>Environmental Health Division</strong></td>
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<tr>
<td>3. BDIS</td>
<td>Hospitals, Labs, MDH (Vital Statistics), DHS</td>
<td>MDH (MCSHN), Local Public Health</td>
<td>100% electronic</td>
<td>100% electronic</td>
<td>Abstracted/entered onto laptops, secure e-mail/fax, extract from website</td>
<td>None</td>
<td>ICD-9, BPA (british pediatric association) codes</td>
<td>Level 2</td>
<td>Level 2</td>
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<tr>
<td>4. BLIS</td>
<td>Labs, Providers, Hospitals</td>
<td>Local Public Health, Labs, Fed (OSHA, CDC), DHS, Health Plans/Payers, Individuals</td>
<td>65-70% electronic</td>
<td>100% electronic</td>
<td>Sent on CD, secure e-mail, secure FTP</td>
<td>HL7, PHIN-MS SNOMED CT, LOINC, for non HL7 there are no national standards</td>
<td>Levels 1-4 1 – paper (one lab) 2 – some 3-4 – LARS - 65-70% are 3-4</td>
<td>Level 4</td>
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<tr>
<td><strong>Infectious Disease Epidemiology, Prevention and Control Division</strong></td>
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<tr>
<td>5. MEDSS (future, currently 50 systems)</td>
<td>Providers, Hospitals, Labs, MDH (MIIC, Vital Statistics), Long-term Care, Schools,</td>
<td>CDC, Local Public Health, MDH labs, Hospitals (ICPs), Providers</td>
<td>95% electronic (Goal is 100%)</td>
<td>100% electronic</td>
<td>Web-based entry, sFTP, PHIN-MS transfer, web-based dissemination</td>
<td>PHIN-MS HL7</td>
<td>ICD-9, CPT, CVX, SNOMED CT, LOINC, FIPS</td>
<td>Projected Level 3.4 – 95%</td>
<td>Level 1,2 – 5%</td>
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<td>6. MIIC</td>
<td>Corrections, other states, Local Public Health</td>
<td>Long-term Care, Health Plans/Payers, DHS, schools, corrections, MDH (refugee health)</td>
<td>100% electronic</td>
<td>95% electronic</td>
<td>Web-based entry, sFTP, batch file uploads (specific file format &amp; HL7)</td>
<td>PHIN-MS HL7 ebXML XML</td>
<td>CPT, CVX, MVX, Race and ethnicity data</td>
<td>Level 4</td>
<td>Level 4 (most partners not in level 4)</td>
</tr>
<tr>
<td>7. Refugee Health</td>
<td>Providers, Local Public Health, Hospitals, Long-term Care, Pharmacies, DHS, MDH (Vital Statistics), Health Plans/Payers, Schools</td>
<td>Providers, Local Public Health, Hospitals, Long-term Care, Pharmacies, DHS, Health Plans/Payers</td>
<td>Sites that use remote data entry = 60% (Ramsey &amp; Hennepin)</td>
<td>View – all electronic</td>
<td>Web-based data entry via e-SHARE</td>
<td>NO</td>
<td>Special codes from CDC</td>
<td>Level 1-3</td>
<td>Level 3</td>
</tr>
<tr>
<td>8. STD InfoNet</td>
<td>Providers, Hospitals, Labs, Local Public Health (public health clinics), Providers, CDC, NEDSS, Local Public Health, other state health departments</td>
<td>Providers, CDC, NEDSS, Local Public Health, other state health departments</td>
<td>20% electronic (LARS)</td>
<td>Very little electronic (to CDC via data file)</td>
<td>Mail/Fax (80%), lab – HL7 to LARS system – load into temp table within STD InfoNet and HL7 and PHIN-MS for ELR</td>
<td>LOINC, disease coding is yes/no</td>
<td>STD Info Net is Levels 1-3; temp table from LARS is 3</td>
<td>Levels 1-3</td>
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<td></td>
<td>MDH (lab), DOC, other state health depts., schools</td>
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<td></td>
<td>then manual matching CDC – data file</td>
<td></td>
<td></td>
<td>(LARS is 4)</td>
<td></td>
</tr>
<tr>
<td>9. eHARS (HIV)</td>
<td>Providers, Hospitals, Labs, Veterans Administration, AIDS Drug Assistance Program from DHS, Local Public Health (public health clinics), other state health departments, MDH (Vital Statistics)</td>
<td>CDC, other state health departments</td>
<td>50% electronic</td>
<td>Only what is sent to CDC is electronic, otherwise phone (always want to do this by phone)</td>
<td>HL7 and PHIN-MS</td>
<td>CDC files – created in application; flat file and sent with no names/address; mail/phone is primary method except for what comes through LARS</td>
<td>ICD-10, LOINC, CDC system automatically calculates</td>
<td>Levels 1-3</td>
<td>Level 3, maybe 4 with new system</td>
</tr>
<tr>
<td>10. STD MIS</td>
<td>Providers, Individuals, Hospitals, Labs, Local Public Health (public health clinics), DOC, Medical Examiners, MDH, other state health departments</td>
<td>Providers, Hospitals, CDC, Local Public Health (public health clinics), MDH (STD, HIV surveillance), individuals (partners), other state health departments</td>
<td>0% electronic</td>
<td>0% electronic</td>
<td>Fax, mail, phone</td>
<td>None</td>
<td>CDC codes</td>
<td>Level 1</td>
<td>Level 1</td>
</tr>
<tr>
<td>11. Infected Healthcare Workers</td>
<td>Providers, Hospitals, MDH, State (Licensing Boards), Long-term Care, Local Public Health, Individuals</td>
<td>AG’s Office, MDH, Individuals, Licensing Boards</td>
<td>5% electronic</td>
<td>0% electronic</td>
<td>Fax, mail, voice</td>
<td>None</td>
<td>None</td>
<td>Level 1</td>
<td>Level 1</td>
</tr>
<tr>
<td>System Name</td>
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<td>12. Health Threat</td>
<td>Providers, Hospitals, Long-term Care, Labs, Local Public Health, MDH, Vital Registrars, Individuals (complaints), Law enforcement/judicial</td>
<td>Providers, Hospitals, Local Public Health, MDH, AG’s Office, Program in Human Sexuality, Judicial</td>
<td>0% electronic</td>
<td>0% electronic</td>
<td>Voice, mail, fax</td>
<td>None</td>
<td>None</td>
<td>Level 1</td>
<td>Level 1</td>
</tr>
<tr>
<td>13. Vital Statistics</td>
<td>Hospitals, Providers, Long-term Care, SSN, DHS, DPS, MDH (MIIC - future), Medical examiners, funeral homes, vital registrars, individuals</td>
<td>NCHS, Local Public Health, MDH, DHS, DOL, SOS, vital registrars, schools, individuals, commercial, CPSC, researchers</td>
<td>90% electronic (current)</td>
<td>99% electronic (future)</td>
<td>web-based – digital certificate, FTP, Encrypted email attachment, Secure server on web site to send to PH nursing agencies, Views by MDH, EVVE (Electronic Verification of Vital Events)</td>
<td>PHIN-MS HL7 ebXML XML</td>
<td>ICD-10, NCHS [Coding for race &amp; ethnicity, CDC &amp; CHS std].</td>
<td>Mostly level 4</td>
<td>Level 4</td>
</tr>
<tr>
<td>14. Trauma Registry</td>
<td>Hospitals, rehabilitation (future), EMS RB (future)</td>
<td>Hospitals, STAC</td>
<td>100% electronic</td>
<td>100% electronic</td>
<td>Web-based direct entry and web-based file upload (HTTP)</td>
<td>Custom (fixed length and custom), export file, XML based on National Trauma Registry</td>
<td>ICD-9, ICD-9-CM, ICD-10, FIPS (county codes), Zip codes, codes unique to injuries (GCS, GOS, AIS, Level 3</td>
<td>Level 3</td>
<td></td>
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<tr>
<td>System Name</td>
<td>Exchange Partners (Information Collection)</td>
<td>Exchange Partners (Information Reporting)</td>
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<tr>
<td><strong>DATA EXCHANGE</strong></td>
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<td></td>
<td>XML format</td>
<td>ISS, OPC, SCI System, EMS RB Codes, MPIN, NPI</td>
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<td><strong>STANDARDS</strong></td>
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<td>XML format</td>
<td>ISS, OPC, SCI System, EMS RB Codes, MPIN, NPI</td>
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<td><strong>INTEROPERABILITY</strong></td>
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<td>XML format</td>
<td>ISS, OPC, SCI System, EMS RB Codes, MPIN, NPI</td>
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<tr>
<td><strong>Health Promotion and Chronic Disease Division</strong></td>
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<tr>
<td>15. MCSS</td>
<td>Hospitals (Cancer registries), Labs, Providers, Long-term Care, MDH (VS), Medical Examiners, out-of-state central cancer registries, HIS</td>
<td>Hospitals, Providers, Labs, CDC, Medical Examiners, NAACCR, Indian Health Service</td>
<td>60% electronic</td>
<td>Minimal</td>
<td>Pathology reports are mostly submitted on paper, flat ASCII files, pathology reports (excel, pdf, word files, txt file), HL7, delimited format</td>
<td>HL7, NAACCR standard for registry data, PHIN-MS (maybe)</td>
<td>ICD-9-CM, CPT, SNOMED CT, ICD-O (for oncology), other codes unique to cancer</td>
<td>Levels 1 - 4</td>
<td>Level 4</td>
</tr>
<tr>
<td>16. Sage</td>
<td>Providers, Labs, Hospitals, MDH (MCSS), Health Plans/payers, individuals</td>
<td>Providers, Labs, CDC, MDH (finance), Individuals</td>
<td>0% electronic</td>
<td>1% electronic</td>
<td>Fax, mail, voice, e-mail attachment to CDC</td>
<td>No</td>
<td>CPT, cancer codes</td>
<td>Levels 1-2</td>
<td>Levels 1-2</td>
</tr>
<tr>
<td>17. TBI</td>
<td>Hospitals, MDH (vital statistics), medical examiners</td>
<td>Providers, Hospitals, CDC, Veterans Administration, HRSA, State Agencies (DHS, DUS, DPS, DLI, DEED, MED, VA, DOC), MDH (Office of Rural Health), Health Plans/Payers, individuals</td>
<td>75% electronic</td>
<td>95% electronic</td>
<td>Direct entry, web-based, sent by paper, FTP, e-mail</td>
<td>Custom (fixed length and custom), export file, CDC receives SAS files, foxpro, flat files</td>
<td>ICD-10, FIPS (county codes), Zip codes, codes unique to injuries (GCS, GOS, AIS, ISS, OPC, SCI System), EMS RB Codes, MPIN, NPI</td>
<td>Level 3</td>
<td>Level 3</td>
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<tr>
<td>18. Stroke Registry</td>
<td>Hospitals</td>
<td>Hospitals, CDC, U of MN</td>
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<td>100% electronic</td>
<td>Web-based entry, secure FTP to CDC</td>
<td>ICD-9, majority are process measures as established by</td>
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<td>System Name</td>
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<td>Exchange Partners (Information Reporting)</td>
<td>Electronic Data Exchange (Data Collection)</td>
<td>Electronic Data Exchange (Data Sending)</td>
<td>Exchange Methods</td>
<td>Standards: Exchange</td>
<td>Standards: Representation</td>
<td>Interoperability: Current Use</td>
<td>Interoperability: Current Capability</td>
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</tr>
<tr>
<td>19. LIMS</td>
<td>Hospitals, Providers, Labs, Federal Agencies (EPA, CDC, FDA, BT, FBI), MDH (Epi, EH), State Agencies (DNR, DOT, MPCA, law enforcement), Joint Commission, AHA, and CDC</td>
<td>Providers, Hospitals, Federal Agencies (EPA, CDC, FDA, BT, FBI), State Agencies (DNR, DOT, MPCA, law enforcement)</td>
<td>Auto-fax server (fax to hospitals) Text files (.csv) Electronic messages (HL7)</td>
<td>HL7, PHIN-MS, (CDC) VisionShare (hospitals), flexnet (FDA), EPA standards</td>
<td>10% electronic</td>
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<td>Levels 2 (current) – 4 (open ELIS)</td>
<td>Levels 2 (current) – 4 (open ELIS)</td>
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<td>20. Newborn Screening</td>
<td>Hospitals, Providers, Labs, Office of State Registrar</td>
<td>Hospitals, Providers, Federal Agencies (NNSIS, CDC), MDH (MSCHN), medical examiners</td>
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<td>Mail, fax</td>
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<td>HL7 (future), PHIN-MS (future)</td>
<td>CPT</td>
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**Legend:**
MDH – Minnesota Department of Health; MIIC – Minnesota Immunization Information Connection; CDC – Centers for Disease Control and Prevention; LPH; ICP – Infection Control Practitioner; E – Electronic; sFTP – Secure File Transfer Protocol, NAACCR (North American Association of Central Cancer Registries)
Appendix D
Current Information Exchange with Partners

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<th>System Name</th>
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<th>Labs</th>
<th>MDH</th>
<th>LPH</th>
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<th>DHS</th>
<th>Other State Agencies</th>
<th>Health Plans</th>
<th>Individuals</th>
<th>Long-Term Care</th>
<th>Other States</th>
<th>Pharmacies</th>
<th>Medical Examiners</th>
<th>Law Enforcement</th>
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<td>5</td>
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</tr>
</tbody>
</table>

* Note: the exchange of information does not necessarily include personal health information. Some of the information exchanged may be in aggregate form.

C = currently collect information from these exchange partners; R = currently report to these exchange partners.

Other Exchange Partners Include:

- WIC MIS – Tribes, banking agent
- Refugee Health – Researchers, Universities
- Health Threat – Program in Human Sexuality
- Vital Statistics – Funeral Homes, Commercial, Researchers, CPSC
- Trauma Registry – STAC
- MCSS – IHS, NAACCR
- Stroke Registry – U of MN
## Appendix E

### Desired Exchange Partners

*Interest of MDH Systems in Linking, Merging, or Exchanging Electronically with Other Data Sets/Systems*

<table>
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<th>MDH SYSTEM NAME</th>
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<th>EXTERNAL EXCHANGE PARTNERS</th>
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<td>WIC MIS</td>
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<td>MCSHN EHDl (early hearing detection)</td>
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<td>BDIS (birth defects)</td>
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<tr>
<td>BLIS (blood lead)</td>
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<td>MEDSS (disease surveillance)</td>
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</tr>
<tr>
<td>MIIC (immunization registry)</td>
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<td>Refugee Health</td>
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<td>STD InfoNet</td>
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<td>eHars (HIV)</td>
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<td>Infected Healthcare Workers</td>
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<td>Trauma Registry</td>
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<td>MCSS (cancer surveillance)</td>
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<tr>
<td>Sage (breast and cervical cancer screening)</td>
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<td>TBI (traumatic brain injury)</td>
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<td>Stroke Registry</td>
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<td>LIMS (lab)</td>
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*Note: the exchange of information does not necessarily include personal health information (PHI). Some of the information may be in aggregate form.

**Other Includes:**

- **BLIS** – tax assessor’s info to find out age of homes
- **Vital Statistics** – marriage information electronically from county recorder’s association
- **MCSS** – National Death Index, driver’s license files, voter registration, census, claims data, encounter data, Rx data
- **Sage** – billing
- **Stroke** – hospital discharge/billing/claims database, Medicare
- **TBI** – rehabilitation data, revenue data
- **Trauma** – financial
- **Health Threat** – co-morbidities
# Appendix F

## Barriers and Resources Needed to Being Able to Exchange Information at Higher Interoperability Levels

<table>
<thead>
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<th>WIC MIS</th>
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<th>EHDI</th>
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<th>BLJS</th>
<th>MEDSS</th>
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## RESOURCES AND TECHNICAL CAPABILITIES NEEDED

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