Minnesota e-Health Initiative

MINNESOTA DEPARTMENT OF HEALTH

REPORT TO THE MINNESOTA LEGISLATURE 2016

MDH Minnesota Department *of* Health
OFFICE OF HEALTH INFORMATION TECHNOLOGY

Minnesota e-Health Initiative

Minnesota Department of Health,
Office of Health Information Technology
PO Box 64882 , St. Paul, MN 55164-0082
651-201-5759
www.health.state.mn.us/e-health

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Protecting, maintaining and improving the health of all Minnesotans

March 2, 2016,

The Honorable Tony Lourey
Chair, Health and Human Services Budget Division
Minnesota Senate
2105 Minnesota Senate Building
95 University Ave. W.
Saint Paul, MN 55155-1606

The Honorable Kathy Sheran
Chair, Health, Human Services and Housing Committee
Minnesota Senate
2103 Minnesota Senate Building
95 University Ave. W.
Saint Paul, MN 55155-1206

The Honorable Matt Dean
Chair, Health and Human Services Finance Committee
Minnesota House of Representatives
401 State Office Building
100 Rev. Dr. Martin Luther King Jr. Blvd.
Saint Paul, MN 55155

The Honorable Tara Mack
Chair, Health and Human Services Reform Committee
Minnesota House of Representatives
545 State Office Building
100 Rev. Dr. Martin Luther King Jr. Blvd.
Saint Paul, MN 55155

To the Honorable Chairs:

As required by Minnesota Statutes, sections 62J.495 and 62J.498-4982, this Minnesota e-Health Initiative report outlines progress toward Minnesota's goals for health information technology.

Minnesota has been an e-health leader for over a decade; all hospitals and nearly all clinics in the state have adopted and are using electronic health records (EHRs). This was accomplished through a combination of statewide and community collaboration, policy initiatives and legislative requirements, funding, and advances in technology.

Despite the success of hospitals and clinics in Minnesota, there is more work to do in support of settings such as behavioral health, long-term and post-acute care, dentistry, state and local public health, and social services. These settings have largely been left out of federal meaningful use programs and incentives, but are critical to Minnesota's goals of serving patients through a statewide network of secure information exchange that includes the full continuum of care. The Minnesota e-Health Initiative is ensuring that these and many other activities in the public-private sector across the state are occurring in a coordinated and focused way.

Sincerely,

Edward P. Ehlinger, M.D., M.S.P.H.
Commissioner
P.O. Box 64975
St. Paul, MN 55164-0975

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Executive Summary

E-health is the adoption and use of electronic health record (EHR) systems and other health information technology (HIT) to manage patient information and move needed information securely among providers based on patient needs and privacy preferences. By supporting the secure and efficient exchange of information between care team members and patients, e-health is a critical foundational element for accountable care and accountable health. E-health also provides essential tools to reduce persistent health disparities and promote equitable access to health care and health information by providing all patients and providers with information to support health, including information on social determinants of health that can influence outcomes.

Minnesota has been an e-health leader for over a decade; all hospitals and nearly all clinics in the state have adopted and are using electronic health records (EHRs). This was accomplished through a combination of statewide and community collaboration, policy initiatives and legislative requirements, funding, and advances in technology. Despite the success of hospitals in clinics in Minnesota, there is more work to do in support of settings such as behavioral health, long-term and post-acute care, dentistry, state and local public health, and social services; these settings have largely been left out of federal meaningful use programs and incentives. Without ongoing support for these settings, and for small providers more generally, Minnesota will leave certain patients and communities behind, without access to a statewide network of secure information exchange that includes the full continuum of care.

Minnesota's Accomplishments and Continued Efforts

Minnesota's success is due to strong collaborative efforts among the intersecting domains of clinical care, policy/research, public health, and consumer engagement through the Minnesota E-Health Initiative. MDH's e-health accomplishments from 2015 and continued efforts for 2016 include:

- Supporting e-health adoption across the continuum of care
- Advancing health information exchange
- Updating health information exchange oversight
- Identifying and defining standards for interoperability
- Enhancing workflow issues in electronic prescribing
- Defining and measuring consumer engagement
- Developing an e-health workforce
- Assessing interoperability needs of MDH programs

- Convening the 11th Annual Minnesota e-Health Summit: Connecting Communities to Advance Population Health

Recommended Action to Advance e-Health throughout Minnesota

In collaboration with Minnesota's health community, MDH has identified several challenges to full implementation of e-health in all communities. These include limited and unbalanced financial incentives, inadequate technical assistance and workforce training to optimize systems and data analysis, and challenges to implementing health information exchange. MDH recommends the following efforts to support continued transformation of the health and health care delivery system to support patient safety and outcomes:

- **Increase adoption and effective use of EHRs for health providers beyond clinics and hospitals, with a focus on smaller settings and organizations, settings with significant barriers to EHR adoption, and those that serve the underserved.** Strategies could include targeted financial and technical assistance, and development of guidance and best practices to adopt and effectively using EHRs to gap areas, including long-term and post-acute care, behavioral health, home care, local public health, dentistry, social services, and others.

- **Advance health equity through e-health** through development of an e-health framework to incorporate social determinants of health into the EHR.

- **Accelerate workforce training in health informatics and health IT** by advancing coordinated curriculum in colleges and universities, establishing health informatics job classifications, and local public health workforce education and training.

- **Monitor and assess Minnesota's e-health system** using a comprehensive approach to support EHR and HIE capability in all settings.

- **Support state and local government to meet requirements of the Interoperable EHR Mandate** by implementing a coordinated approach to secure HIE in MDH and other state government agencies and replacing numerous obsolete, non-standard systems with modern, shared data systems.

- **Strengthen privacy and security of patient health information** through development and dissemination of best practice models for conducting privacy risk assessments, and providing technical assistance, education and training for providers, EHR vendors and patients on the requirements of federal and state laws.

- **Advance use of health information exchange (HIE)** through grant funding, continued technical assistance, education and training, and HIE oversight. Strategies could include supporting providers and public health in establishing connections to certified HIE service providers, establishing standardized or shared HIE services to enable statewide interoperability, or other types of support.

Introduction

Minnesotans face an increasingly complex health system, driven by innovations in technology that provide solutions to more and more health conditions, as well as the opportunity to use health information for improved health outcomes. At the same time, the health system faces changing population characteristics such as an aging population that will drive increasing costs associated with chronic diseases, an increasingly diverse population, and fewer healthcare providers to serve these growing and changing needs.

Our health system has become fragmented as specialty services evolve to manage these needs, creating a challenge to coordinate care across the continuum. At the same time, there is an increasing recognition that, in order to effectively improve health for all Minnesotans, health care providers need to partner with, and coordinate care with, a wider range of community, social services, and other health-related organizations. Effective, secure movement of health information is essential to ensure all providers have the information they need for patients to receive the care they need when they need it. Health information technology or "e-health" provides a critical tool to support these needs.

E-health is the adoption and use of electronic health record (EHR) systems and other health information technology (HIT) to manage patient information and move needed information securely among providers based on patient needs and preferences. Across the nation, e-health is emerging as a powerful strategy to transform the health system and improve the health of individuals and communities. It is considered an essential tool to improve health care quality, increase patient safety, reduce health care costs, and enable individuals and communities to make the best possible health decisions.

Imagine this scenario:

> *Mike is a 57 year old diabetic with physical and mental health issues that he manages through medication, and he relies on long-term disability for income. He had also cared for his elderly father while living in his father's home. When his father passed away, the house had to be sold and Mike had nowhere to go. Without a support system, Mike had a hard time controlling his diabetes and depression on his own. He struggled to find stable housing, healthy food options, and employment opportunities. Soon thereafter Mike was hospitalized for kidney and heart issues due to out-of-control diabetes. He was treated and released, but struggled to manage side effects from his new medications. He connected with the local social services agency for support, but continued to struggle, resulting in repeated emergency department visits. Despite Mike's requests for information sharing, information was not moving between these providers, resulting in poor health and well-being for Mike.*

E-health provides the opportunity for Mike to regain control of his health and well-being by ensuring that all of his care providers have the correct information to support his needs. This is facilitated by information flowing – with Mike's permission – between his doctor's office, his psychologist, social services, and the hospital emergency room. Mike also has the information

he needs to take control of his disease management, using e-health to monitor his diabetes and heart conditions and develop skills for healthier living.

Why e-Health Matters

E-health provides a foundation for healthcare transformation in Minnesota. The technology supports advanced and efficient patient care, and the information in these systems supports care coordination and individual decision-making. This section describes how e-health supports health reform in Minnesota and MDH's values of equitable health for all people and communities.

A story of HIE

Sally is a nonverbal adult client with severe autism and chronic ear infections. Inevitably, she wakes up in the middle of the night with ear pain and a fever. The on-call physician typically would send her to the ER in the middle of the night. Due to her autism and fear, Sally would fight these trips. She would need to be sedated and restrained during the ambulance ride. Under the old approach, she visited the ER more than a dozen times in 2014 and 2015. Under the new approach with HIE connections in place, an electronic patient data portal is used, where the attending clinician could see Sally's history of ear infections.

In May 2015, Sally had another late-night ear infection. This time, the clinician consulted the portal with authorization from Sally's caregiver, asked group home staff some diagnostic questions, and prescribed antibiotics that were delivered that night. The clinician then closed the loop the next day with a home visit. Sally was able to receive immediate care and recover at home without the usual trauma she experienced. Since her medical information was accessible by HIE connections the three objectives of the Triple Aim - improve patient experience, improve the population health, and reduce cost of care - were met.

– George Klauser, Executive Director, Lutheran Social Services/Altair Accountable Care Organization

E-health is a Foundation for Accountable Health

As the model of health and health care in Minnesota and across the nation increasingly moves from payment for services to payment for value and outcomes, e-health is a critical component in supporting the secure, accurate and efficient exchange of information between the care team as well as the patient. Organizations that are unable to securely exchange information across a wide range of partners that share accountability for a patient's care will be much less likely to succeed in accountable care arrangements.

In 2013, Minnesota received a federal State Innovation (SIM) grant to support the expansion of accountable and coordinated care in Minnesota through the Minnesota Accountable Health Model (the Model). The SIM grant, which is a partnership between MDH and the Minnesota Department of Human Services, also focuses on building connections across providers in the

local public health, social services, long term care, and behavioral health communities. The MDH Office of High Information Technology's (OHIT) role in supporting the Model is to provide informatics leadership and develop tools and roadmaps for providers to establish the e-health infrastructure to participate in an Accountable Care Organization (ACO) and provide funding for planning and implementation for health information exchange across settings. Building on the successes of past activities, OHIT is working to build capability and capacity for e-health across the continuum of care and within ACOs through these programs:

E-health grants

Community focused grants have been a successful e-health implementation approach for over a decade. The current grants provide funding to groups of organizations within a community to support the secure exchange of medical or health-related information between organizations for care coordination, with a focus on the four priority settings of behavioral health, local public health, long term and post-acute care, and social services.

E-health roadmap

Minnesota is leading the nation by pioneering the development of a Minnesota e-Health Roadmap for behavioral health, local public health, long-term and post-acute care, and social services. The roadmap provides recommendations and actions to effectively coordinate care across settings using technology and health information exchange. The e-Health Roadmap includes concrete, achievable short- and medium-term steps and as well as longer term aspirational goals. In addition, the e-Health Roadmap is action-oriented and based on use cases developed by Minnesota's health and health care community. The roadmap represents a pioneering collaborative between MDH and community stakeholders to achieve a common path towards improved health for all individuals and their families and communities.

Privacy, security and consent management for Health Information Exchange

This work supports health care professionals, hospitals and health settings in using e-health by ensuring that all providers understand how to use, disclose and share health information in a safe and secure manner in compliance with state and federal law. The program also identifies opportunities to improve current practices for managing consent, including education and technical assistance.

Additional information on these efforts, funded through the SIM program of the Centers for Medicare and Medicaid Services, is in Appendix C.

E-health is a Tool to Support Health Equity

Minnesota is one of the healthiest states in the country. However, not all Minnesotans have the same chances to be healthy. These health inequities cannot be fully explained by bio-genetic factors and are often the result of serious social, economic and environmental disadvantages such as structural racism and a lack of equal access to economic and educational opportunities.

The 2014 MDH report "Advancing Health Equity in Minnesota: Report to the Legislature" identified e-health as a tool for advancing health equity. For example, EHRs have the potential to describe social determinants of health, which can allow providers, patients, and public health to fully understand the factors affecting health and well-being. Such information can help providers understand if a patient has unstable housing, financial strain, food insecurity, transportation issues, or social isolation. Providers can then refer patients to support services to address those needs, and develop a care plan that accounts for these issues.

E-health provides additional tools to reduce these disparities and promote equitable access to health care and health information in these ways:

- A patient's health information can be easily shared among all of the care providers with whom the patient allows to see the information, regardless of where care is sought. This is particularly important for patients with complex or multiple conditions.
- Using patient-specific information such as chronic conditions and allergies, clinical care tools can be automatically presented to the patient to support safety and improved outcomes.
- All of Minnesota's hospitals and nearly all clinics have EHR systems installed, so rural and underserved populations have equitable access to the benefits of e-health.
- Providers can use aggregated data on patients to get a better understanding of gaps in health outcomes by characteristics such as race, ethnicity, geography, or co-morbidities.
- Health organizations can analyze these data to identify populations that are not receiving recommended health services and care improve access to culturally-appropriate care.

E-health Supports Healthier People and Communities

Roughly one-third of Minnesotans were treated for a chronic disease in 2012; of those, more than half were treated for multiple chronic diseases[1]. Roughly twenty percent of Minnesotans live with a mental illness. For all of these individuals and their families, and for the teams of health care professionals who work to help them live healthy lives, lack of coordination between mental/behavioral health providers and primary and specialty care providers results in fragmented care and difficulty addressing co-morbidities.

In order to effectively manage care and improve health for complex patients, health and health care providers across the spectrum of care must have the ability to securely exchange information with other providers within the health care system, in compliance with patients' preferences.

MDH and the Minnesota e-Health Initiative are developing a framework that provides guidance to professionals, organizations, and leaders on what e-health capabilities are needed to achieve

[1] "Chronic Conditions Prevalence and Spending for Minnesotans with Health Insurance Coverage, 2012." Minnesota Department of Health, January 2016

accountable health and effectively improve coordination of care for complex patients. E-health plays a foundational role in these critical components of the framework:

- **Engaging and activating individuals and caregivers** through electronic communication with their providers and information to support the individual's engagement in their own health.
- **Engaging and activating all health providers** through automated decision support rules and access to comprehensive information such as medication histories, communicating with patients electronically, and receiving timely public health alerts.
- **Extending care coordination into the community** by enabling care coordinators to have access to individual health information to provide better care, improve referral coordination, and support successful transitions between settings.
- **Monitoring cohorts and attributed populations** by analyzing aggregated data on specific populations to identify gaps in care and ways to improve their health.
- **Managing population health** with timely access to community population-based data, enabling community-wide improvements in population health.

Health and health care within Minnesota's communities is an ecosystem of care and services provided across a broad spectrum, including individuals and their caregivers. The components of this framework all intertwine to support the ecosystem as a result of standardized collection and sharing of health information.

Minnesota is an E-health Leader Yet Gaps Remain

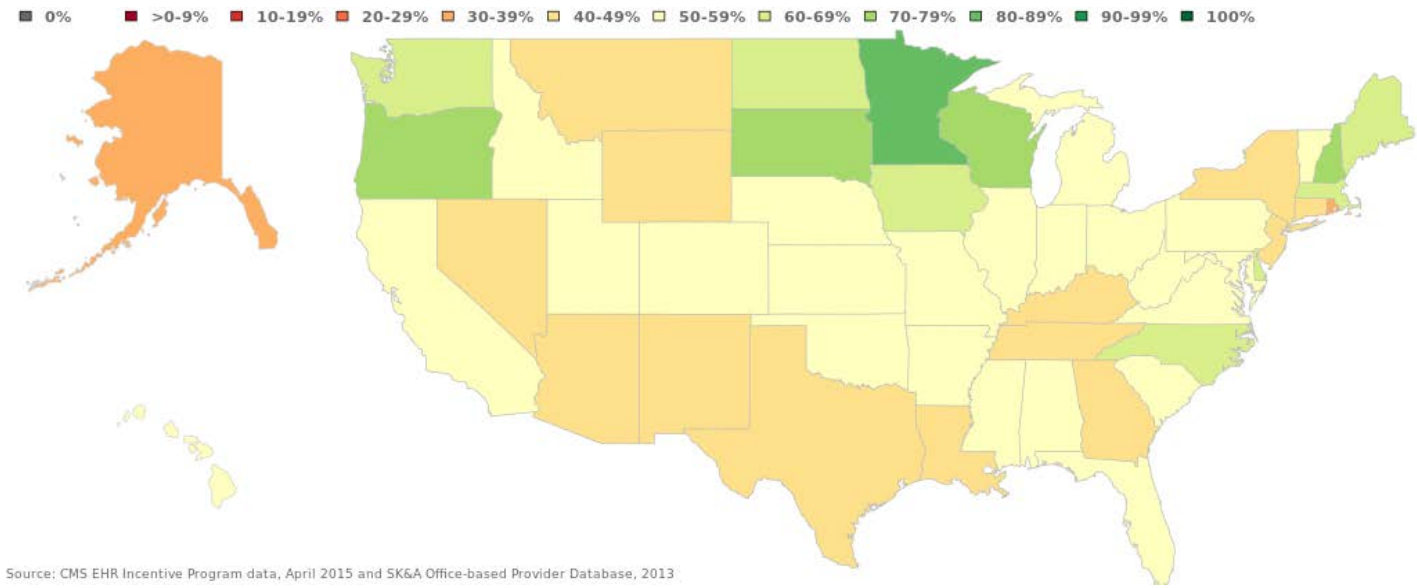
Minnesota has been an e-health leader for over a decade; all hospitals and nearly all clinics in the state have adopted and are using electronic health records (EHRs). This was accomplished through a combination of statewide and community collaboration, policy initiatives and legislative requirements, funding, and advances in technology.

In 2007, the Minnesota Legislature passed the Interoperable EHR Mandate, which states that all hospitals and health care providers must use an interoperable electronic health record (EHR) system by Jan. 1, 2015 (Minnesota Statute § 62J.495 Electronic Health Record Technology). An important component of this law is that providers not only adopt the technology, but that they use the tools available in their EHRs and securely exchange relevant health information with other providers to optimize patient care.

In 2009, Congress passed the Health Information Technology for Economic and Clinical Health Act (HITECH Act), which authorized financial incentives in the Medicaid and Medicare programs through the meaningful use incentive program. The objective is to ensure that the adoption and use of health IT contributes to a more efficient, effective and safe health care system that achieves improved health outcomes. In order to access federal meaningful use incentives, eligible professionals and hospitals adopt, implement, upgrade, or demonstrate "meaningful use" of a certified EHR system. Meaningful use is currently defined by three consecutive stages with each stage having more advanced EHR and health information exchange requirements.

As a result of these policies and the efforts of the Minnesota Department of Health (MDH) and the Minnesota e-Health Initiative, Minnesota leads the nation in adoption and use of EHR systems. Exhibit 1 shows that Minnesota leads the nation in percent of physicians who have demonstrated meaningful use of certified EHRs.

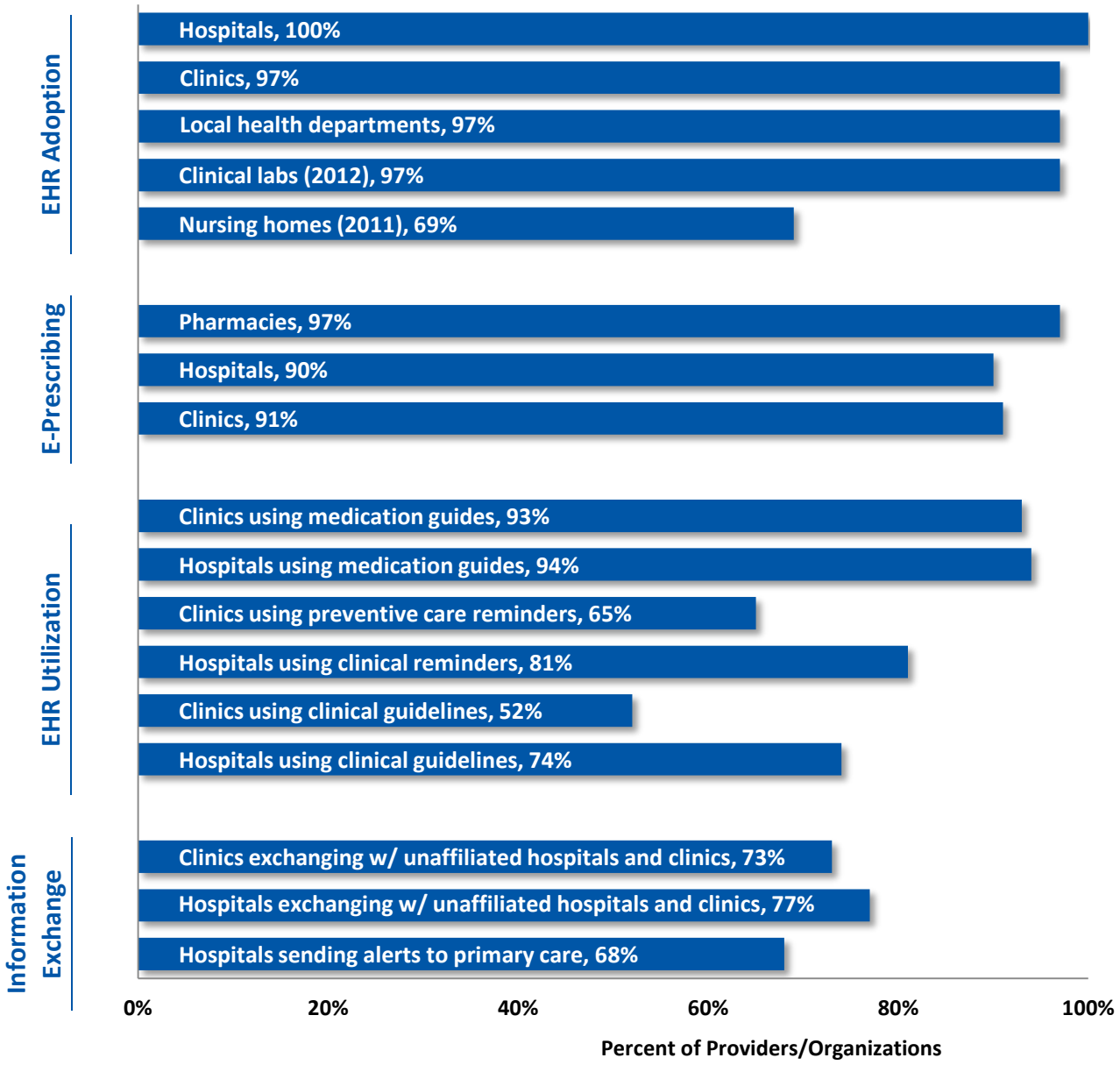
Exhibit 1: Percent of Physicians that have Demonstrated Meaningful Use of Certified Health IT, April 2015



However, not all health care providers, nor public health, have received equal attention in these efforts. Federal financial incentive opportunities have been limited to clinics and hospitals, and some dentists. Providers left out of this incentive funding include behavioral health, long-term and post-acute care, state and local public health, social services, and many other settings. As a result, while these settings serve some of the most vulnerable and complex patients in the health care system, they lag in adoption of HIT, and face fewer reliable technology options due to vendor emphasis on the settings eligible for financial incentives.

Nonetheless, all of Minnesota's providers, as well as public health, are making significant e-health progress. As a core part of its work, MDH's Office of Health Information Technology (OHIT) conducts regular assessments of EHR adoption and effective use by Minnesota health and health care providers. Exhibit 2 provides a summary of data on e-health adoption, utilization and electronic exchange of health information in Minnesota. The data clearly reflect how settings have adopted EHR capabilities that are nation leading. However, the rates for effectively using the EHRs systems, easily exchanging information and achieving interoperability are lower in certain settings, and represent a gap in achieving the potential of EHR investments.

Exhibit 2: e-Health Adoption, Utilization and Exchange in Minnesota



Source: Minnesota Department of Health, Office of Health Information Technology, Minnesota e-Health Profile, http://www.health.state.mn.us/e-health/assessment.html. Data reflect 2015 except where noted. Terminology is defined at http://www.health.state.mn.us/e-health/glossary.html.

Additional data on use of health information technology among Minnesota's health and care system is in Appendix A.

The Minnesota e-Health Initiative and Advisory Committee

Since 2004 the Minnesota e-Health Initiative (the Initiative), led by the Minnesota e-Health Initiative Advisory Committee and OHIT, has advocated for and supported effective and secure use of e-health across the continuum of care. The Advisory Committee is a 25-member legislatively-authorized committee appointed by the Commissioner of Health to build consensus on important e-health issues and advise on policy and common action needed to advance the Minnesota e-Health vision (Exhibit 3). The committee is made up of a diverse set of key Minnesota stakeholders, including: consumers, providers, payers, public health professionals, vendors, informaticians, and researchers, among others.

Exhibit 3: The Minnesota e-Health Vision is to accelerate the adoption and effective use of Electronic Health Record (EHR) systems and other health information technology (HIT) in order to improve health care quality, increase patient safety, reduce health care costs and improve public health.

The vision's comprehensive scope includes four domains:

- Consumers
- Clinicians
- Policy/Research
- Public Health

Working across the continuum of care, the Initiative's shared purpose is to:

- **Empower consumers** with information and tools to help make informed health and medical decisions.
- **Inform and connect health care providers** by promoting the adoption of EHRs, effectively using clinical decision support, and achieving interoperable EHRs.
- **Protect communities and improve public health** by advancing efforts to achieve interoperable public health system and population health goals.
- **Modernize the infrastructure and increased workforce informatics competencies** through adoption of standards for health information exchange, supporting policies for strong privacy and security protection, and supporting informatics education and funding.

MDH's role with regard to the Initiative is achieved through the leadership and actions of OHIT. OHIT activities include coordination with stakeholders, assessment of e-health progress in Minnesota, determination of e-health gaps, program development, education, and training

activities. Specifically, OHIT carries out the following responsibilities necessary for e-health progress in Minnesota:

- Overseeing statewide e-health responsibilities under Minnesota Statutes, sections 62J.495 to 62J.4982, including: recommendations for e-health assessment, strategy development, policy alignment and guidance, e-health standards, and outreach and education activities to Minnesota providers on achieving Minnesota's goal for interoperability.
- Convening stakeholders to create and implement a comprehensive and unified vision for e-health across all health and health care providers Minnesota.
- Implementing e-health portions of Minnesota's Accountable Health Model through funding from the Center for Medicare and Medicaid Services State Innovation Model program.
- Advancing public health informatics within MDH programs.
- Providing expertise in health informatics and EHRs to guide e-health policy development and implementation, support outreach efforts, and provide other technical assistance such as: education and training; guide development; developing consensus around best practices; and assessing progress, practices, and barriers.

Much of the success of e-health in Minnesota can be attributed to the collaborative nature of many dedicated individuals and organizations committed to the Minnesota e-health vision and purpose. A summary of many of the work accomplishments of the Initiative can be found in Appendix B.

Minnesota's Accomplishments and Continued Efforts

Achieving the vision of the Initiative requires a collaborative effort among the intersecting domains of clinical care, policy/research, public health, and consumer engagement. This work is accomplished through workgroups led by Advisory Committee members and supported by OHIT staff. OHIT also has statutory responsibility for Health Information Exchange (HIE) oversight, and supports the informatics needs of the agency.

A summary of accomplishments from 2015 and continued efforts for 2016 are described in this section. These efforts were the result of more than 50 stakeholder meetings, 45 presentations to local and national audiences, five coordinated responses to national proposals, weekly update emails to over 4,000 stakeholders, published guidance, and the annual Minnesota e-Health Summit.

Supporting e-Health Adoption across the Continuum of Care

Policy makers in Minnesota have recognized that more effective use of health information technology – including timely exchange of information – is needed to improve quality and safety of care, as well as to help control costs. As such, Minnesota enacted legislation in 2007 that requires *all health care providers* in the state to implement an interoperable electronic EHR system by January 1, 2015 (Minn. Stat. §62J.495).

Many types of providers, particularly those not practicing out of hospitals or clinics, struggle to achieve the EHR mandate for several reasons. These providers have not benefited from the same financial incentives as many hospitals and clinics, and the vendor provided technology to meet their practice needs has not evolved at the same pace. The Initiative and OHIT have provided guidance and toolkits to support these settings, but financing, technical assistance and technological barriers remain.

Working towards achieving the Continuum of Care

"Many behavioral health providers are seeing the need for and benefits of exchanging health information electronically to improve health care quality for individuals with mental health concerns. They are beginning to implement the technology and exchange information in their practices. This represents positive momentum for behavioral health providers to participate in supporting the overall health and wellbeing of their clients. In my own practice health information exchange has been extremely helpful to ensure my clients' information is securely transmitted among the providers with whom they choose to share the information."

– Trisha A. Stark, Ph.D., LP, MPA

In 2015, the Minnesota Legislature amended the EHR mandate to exempt providers who have solo private practice or do not accept insurance. In response to these changes, MDH developed updated guidance and factsheets for health care providers. The Initiative will continue to work with providers across the care continuum to help advance e-health in support of healthier individuals and communities, and to respond to any additional revisions to the law.

Advancing Health Information Exchange

In 2015, much of OHIT's work related to supporting and advancing HIE grew out of the SIM grant, and fell into one of three programmatic areas:

- Awarding and overseeing grants to community collaboratives to support HIE, with a focus on the priority settings of behavioral health, local public health, long term and post-acute care, and social services;
- Developing an "e-Health Roadmap" for the four priority settings, outlining actions to promote HIE within and across these settings; and
- Providing education on privacy, security and consent management for HIE.

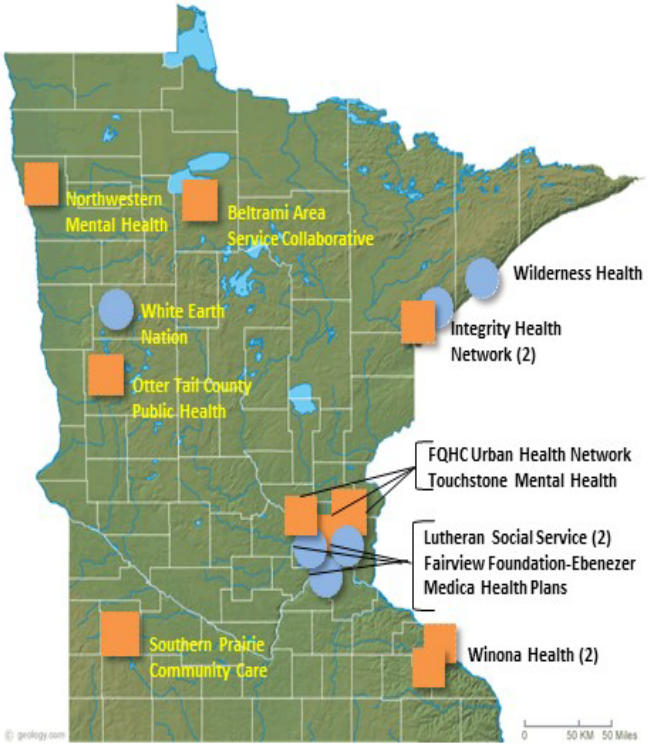
E-health grants

As part of the Minnesota SIM program OHIT managed an HIE grant program to support the secure exchange of medical or health-related information between organizations participating in an accountable care models so that it occurs in a more seamless and real-time way across settings. MDH awarded two rounds of SIM funding, including 12-month development or 18-month implementation grants, to support:

- Expanded HIE to SIM-Minnesota priority settings (long-term and post-acute care, behavioral health, local public health and social services);
- Effective HIE use to improve care coordination, health care and population health; and
- Readiness to advance the Minnesota Accountable Health Model and accountable communities for health.

The grants are designed to help care team members from clinical, community, and social service settings use HIE and health information technology to better meet the health needs of patients and community members. Exhibit 4 shows grant recipients for both funding rounds.

Exhibit 4: State Innovation Model E-health Grantees, Rounds 1 and 2



Development Grant

Integrity Health Network (Duluth), $65,885
Medica Health Plans (Minnetonka), $75,000
Fairview-Ebenezer (Minneapolis), $75,000
White Earth Nation (White Earth), $75,000
Lutheran Social Service (St. Paul), $75,000
Wilderness Health (Two Harbors), $75,000

Implementation Grant (Round 1 and 2)

Touchstone Mental Health (Minneapolis), $567,597
Southern Prairie Community Care (Marshall), $897,780
Winona Health (Winona), $265,950 and $ 245,000
FQHC Urban Health Network (St. Paul), $440,970
Northwestern Mental Health (Crookston), $749,323
Otter Tail County Public Health (Fergus Falls), $483,565
Integrity Health Network (Duluth), $222,748
Lutheran Social Service (St. Paul), $348,169
Beltrami Area Service Collaborative (Bemidji), $201,409

E-health Roadmap for Behavioral Health, Local Public Health, Long-Term and Post-Acute Care, and Social Services

The Minnesota e-Health Roadmap for Behavioral Health, Local Public Health, Long-Term and Post-Acute Care, and Social Services project was launched in early 2015 to provide recommendations and actions to support adoption and use of e-health in these settings. This work was done in collaboration with Stratis Health under contract with Minnesota's State Innovation Model funding. In addition, several hundreds of volunteer hours were contributed by stakeholders for the development of the Minnesota e-Health Roadmap.

A Steering Team and four setting-specific workgroups came together to develop consensus among stakeholders regarding the current challenges facing their settings where e-health could be used to improve outcomes. The groups developed over fifty stories, or 'use cases,' regarding challenges in the current state where care coordination is difficult. Of those fifty plus stories, the group prioritized eight stories for deeper analysis.

In early 2016, the preliminary e-health roadmap draft will be disseminated for broad input and awareness, with the final draft expected in June 2016.

Privacy, Security and Consent Management for Health Information Exchange

In 2015, MDH awarded two grants, using SIM funding, to assist providers with understanding Minnesota and Federal privacy, security, and consent laws. This work entails conducting legal analysis of the various state and federal laws to identify differences and approaches for implementing best practices (Part A) and the development and dissemination of educational resources to providers (Part B).

This work started in the summer of 2015 and included initial legal analysis, gathering input from various audiences on the overall direction of the work, and the development of initial resources for piloting in early 2016. This work will be completed by the end of 2016, including complete legal analysis and widespread dissemination of the developed resources addressing privacy, security, and consent. This work was done by Gray Plant Mooty (Part A) and Hielix, Inc. (Part B), in consultation with an advisory body of HIE and privacy/security experts.

Minnesota HIE Framework for Accountable Health

In June 2015, OHIT and the Initiative issued a draft of the Minnesota Health Information Exchange Framework for Accountable Health that describes HIE capabilities necessary for making progress in an accountable health environment. This framework is important guidance for providers that want to expand their capabilities to better support coordinated care and population health improvements in their community. Based on feedback received from various stakeholders, the framework continues to develop, and will be published in 2016.

MN e-Health HIE Workgroup Activities

The Minnesota e-Health Health Information Exchange Workgroup developed draft recommendations in 2015 on how to advance HIE statewide, given the wide array of barriers identified. For more information on the barriers, see Appendix E. In 2016, the workgroup will finalize its recommendations to the Advisory Committee for consideration. In addition, the workgroup is identifying various types of situations and the information that needs to be exchanged between settings such as:

- Notification and Alerting (e.g. Alerts and admission, discharge, and transfer information)
- Transitions of care (e.g. Care summary/health history information)
- E-prescribing and medication history
- Referrals for services
- Shared care management plans
- Required reportable public health information
- Laboratory orders and test results

The workgroup will continue in 2016 to develop recommendations to address key priority HIE needs, and develop a work plan to implement the recommendations.

Updating Health Information Exchange Oversight

The Minnesota Legislature enacted the HIE Oversight Law (Minnesota Statutes §§62J.498-4982) in 2010 based on recommendations from the Advisory Committee in order to:

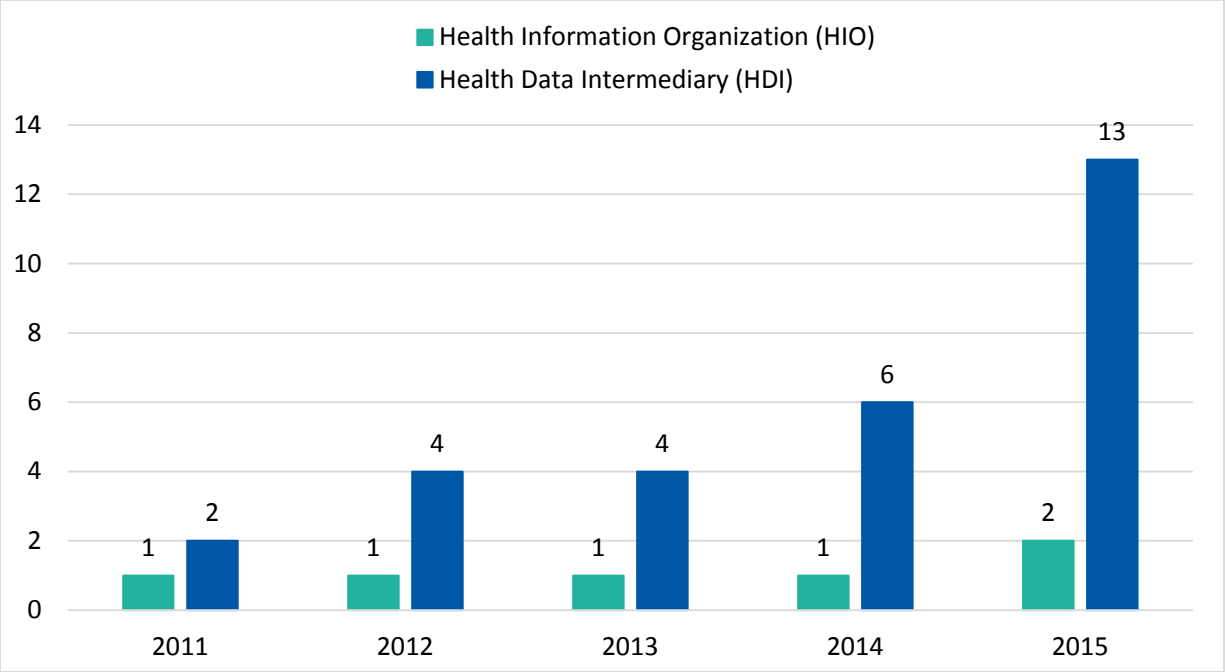
- Ensure that information follows the patient across the full continuum of care
- Prevent the fragmentation of health information that can occur when there is a lack of interoperability or cooperation between HIE service providers
- Ensure that organizations engaged in HIE are adhering to nationally recognized standards
- Ensure that HIE service providers properly protect patient privacy and security
- Ensure that Minnesota has a reliable HIE infrastructure in place to allow Minnesota providers and hospitals to achieve meaningful use incentives

The Minnesota Legislature updated Minnesota's HIE oversight law in 2015. Those updates were helpful in streamlining the requirements for entities seeking certification to be a State-Certified Health Information Exchange Service provider while modernizing the requirements to be more in harmony with the national direction for HIE. The changes in the law went into effect in July, and MDH notified entities that it believes are affected by the requirements of the changes.

As part of its role under the HIE Oversight law, MDH is responsible for certifying organizations as Health Data Intermediaries (HDI) or Health Information Organizations (HIO). As part of that process, staff from OHIT work with organizations throughout the application process to make sure that application requirements are met, hold public hearings for certain applicants, and monitors ongoing compliance with the law's requirements. OHIT is currently working with a number of entities that are working to meet the application or certification renewal requirements.

In 2015, seven HDIs and two HIOs were certified by MDH to provide HIE services in the state for a total of 15. This is a dramatic increase in certifications in 2015 (Exhibit 5). In 2016, MDH expects to continue certifying more HIE service providers and will focus on connecting these providers to support and promote seamless connections between health and healthcare providers statewide. Those requirements will define a set of services and requirements that can be done similarly between entities so that providers that want to exchange data using different State-Certified HIE Service Providers can do so more easily. For more information, see MDH's HIE Oversight Factsheet:
http://www.health.state.mn.us/divs/hpsc/ohit/ohitdocs/hieoversightlaw.pdf

Exhibit 5: Number of HIE Service Providers Certified in Minnesota, 2011-2015



Counts as of December 31 in each year.

Identifying and Defining Standards for Interoperability

E-health standards are essential to ensure the effective use of EHRs and to successfully achieve interoperability of health information. The identification of the right standards to use is complex and an ongoing activity. The Initiative supports development and implementation of e-health standards as directed by the federal Office of the National Coordinator (ONC) and the Standards and Interoperability Framework, an open forum for standards development. Achieving interoperability is a complex activity with at least three key essential components. It requires the identification of the appropriate standards, the effective implementation and use of the standards and efficient integration of the information into the provider's EHR workflow.

In 2015, MDH led the Initiative's work to support these efforts with three significant accomplishments:

- Managing Minnesota's coordinated response to ONC's Draft Interoperability Standards Advisory, including input from stakeholders statewide and across the care continuum. The response emphasized the need to align standards development with Minnesota's priorities relating to health equity and accountable models of care.

- Managing a coordinated response to ONC's 2015 Edition Health IT Certification Criteria, 2015 Edition Base Electronic Health Record (EHR) Definition, and ONC Health IT Certification Program Modifications. This response included input from stakeholders statewide and across the care continuum. The response emphasized the need to emphasize patient-centric measures that apply across all communities in the state. In particular, use of technology to support patient care but not supplant patient preferences for care.

- Convening a Standards and Interoperability workgroup meeting dedicated to discussing Minnesota's priorities for standards relating to social determinants of health. Efforts at the national level did not align with important priorities for Minnesota's health care providers, such as preferred language and gender identity.

Going forward, MDH and the Initiative will continue to support ongoing national efforts on standards development and implementation to ensure they meet the needs of Minnesota's health and health care providers. This will include managing a coordinated response to annual updates to ONC's Interoperability Standards Advisory and any other proposals.

Enhancing Workflow Issues in Electronic Prescribing

In February 2015, OHIT published "A Practical Guide to Electronic Prescribing, Edition 2" with support from the 2014-15 e-prescribing workgroup. This guide supports prescribing providers, pharmacists and pharmacies, payers/pharmacy benefit managers and others to achieve the quality and safety benefits of e-prescribing, and to support compliance with Minnesota law. The Initiative published the first edition of this guide in 2009 and since that release adoption of e-prescribing has grown dramatically. Over time, there have been regulatory changes, technology updates, and unresolved workflow issues that potentially affect patient health and safety.

The workgroup identified gaps, barriers, and opportunities related to these issues and developed recommendations to enhance the complete implementation of e-prescribing transactions. These recommendations are shared nationwide through best practices described in the updated guide, presentations to state and national audiences, and collaboration with stakeholders such as the National Council for Prescription Drug Programs and the American Pharmacists Association.

Defining and Measuring Consumer Engagement

Consumer engagement in e-health can have many different meanings, ranging from engagement in one's wellbeing, to use of technologies to support health, to consent for research, to making use of transparent price information to make decisions about care. The Initiative convened a workgroup in 2014-15 to discuss the state and national landscape for consumer engagement and develop a consumer engagement definition that aligns with the efforts of the Initiative. The workgroup's proposed definition is:

Empowering people to maintain and improve both their health and health care through health information technology by:

- Increasing individuals' access to useable, comprehensive data.
- Enabling informed decision making using health information.
- Facilitating strong partnerships between individuals and providers of care and other services that impact health.

Going forward, the workgroup will further vet this proposed definition among stakeholders in Minnesota, and develop a definition of an *active* e-health consumer. The workgroup will also explore available metrics relating to consumer engagement and e-health stakeholders' current or planned activities relating to consumer engagement.

Keeping everyone involved

Jackie was admitted to the hospital for an infection that resulted in needing long-term care. With all of the medication changes, therapy appointments, and lab tests and information overload, it gets to be overwhelming to remember the details. Jackie felt like she was losing control of her care plan. She was getting frustrated and feeling like herded cattle.

Realizing this common situation, an app was created for patients to download onto their tablets (7 inch or larger Apple or Android devices) to be used in hospital or for family members to use from home with permission. If a patient does not have their own tablet, one will be provided for their use until discharge. The app links to their medical records and provides patients with their vital signs, test results, therapy appointments, medications and daily schedules. Patients are also able to use the app to request blankets, water or other nonemergency needs. This not only saves time for the nurses, it also helps to make Jackie's stay a little more comfortable. With this app, Jackie is able to monitor her blood pressure and check other test results. She is also able to research her treatment and medication side effects. Access to her health data lets her know if she is making progress and what she needs to do. The app gives back Jackie's sense of control over her health and keeps her engaged.

– HealthEast Care System

Developing an E-health Workforce

The Minnesota e-Health Workforce Ad Hoc Workgroup identified several key recommendations in 2015 to develop the e-Health workforce in the state. Recommendations fell into four categories:

- License Requirements/Mandates
- Enhancements to Current Educational and Training Curriculum
- Training Opportunities for Incumbent Workers
- Student, Employer and State Awareness Campaigns

Recommendations were based on these foundational needs for the HIT workforce:

- An elevated understanding of data, what it is and how it is used to improve health care delivery and population health.
- Core understanding of the principles of health informatics
- Skills and knowledge of business and systems analysis.
- Developers need the appropriate programming skills and guidance implementing uniform standards to achieve interoperability

The workgroup concluded that workforce education and training needs can be addressed by incorporating skills training and educational programs into funding for HIT implementation. It is essential for people to have a deeper understanding of the systems and processes involved with HIT initiatives so they can have the greatest impact. The workgroup also saw a need to foster partnerships between the state, employers, and educational institutions to increase awareness of HIT careers and pathways.

In 2016, this workgroup will develop recommendations to implement workforce training along two pathways: Short term on-demand training to increase capacity for clinical workers to develop skills and knowledge for health IT and informatics; and academic curricula for Minnesota's post-secondary schools to incorporate informatics requirements for students entering health professions.

Assessing Interoperability Needs of MDH Programs

Public health programs at MDH are experiencing an increasing demand from health and health care providers to stay current with the private sector trends of electronically moving health information using national standards. Demands for fast access to health information to address public health needs are rising rapidly. Local public health and other health care providers are calling for greater access to electronic public health data to improve response to health threats, support quality and safety, reduce costs, and more effectively target public health interventions to improve health.

A strategic priority of MDH is to move toward receiving electronic public health data from external stakeholders, such as health care providers, local public health, pharmacies, and others, through an approach that is secure, coordinated, and efficient, uses appropriate data standards, meets all state and federal privacy laws, and aligns with best practices. This kind of data exchange will also enhance the work MDH does to support and improve population health.

To address this need, MDH is planning to convene internal and external stakeholders to develop an e-public health roadmap and action plan for a coordinated, agency-wide approach to secure electronic public health data submission. The e-public health action plan will include a timeline, concrete steps and clear accountability for progress. The roadmap and action plan will provide a realistic, achievable, and coordinated approach for MDH's 20+ program areas that need to exchange data with providers and local public health.

Minnesota 11th Annual e-Health Summit: Connecting Communities to Advance Population Health

The Initiative's annual summit, held June 16-17, 2015, shared experiences of Minnesota's communities in optimizing e-health to transform health care and advance population health. More than 300 attendees participated in 22 Sessions and workshops and some 35 speakers highlighted practical information from those achieving success at the various stages of Minnesota's HIT Implementation Plan — from adoption to effective use and exchange, and innovation. The summit provides an annual opportunity for professionals statewide who are working on e-health related efforts to share their stories, lessons learned and network with colleagues. The slides and other materials provide a library for educations and training throughout the year.

Challenges and Recommendations

While Minnesota has begun to realize the benefits of e-health to improve individual and community health, support accountable care, improve consumer engagement, and advance health equity, we face significant challenges to achieving the full potential of e-health. Many of these challenges are related to a lack of statewide interoperability, and disparities in adoption and effective use of EHRs.

Secure exchange of patient information among provider organizations is critical to care coordination, especially for individuals who receive care or support the care of others and those with chronic disease(s), behavioral or mental health issues. Roughly, one-third of Minnesotans were treated for a chronic disease in 2012; of those, more than half were treated for multiple chronic diseases. Roughly twenty percent of Minnesotans live with a mental illness. For all of these individuals and their families, and for the teams of health care professionals who work to help them live healthy lives, lack of coordination between mental/behavioral health providers and primary and specialty care providers results in fragmented care and difficulty addressing co-morbidities.

What Lack of Interoperability Looks Like

On a day-to-day basis, lack of interoperability can reveal itself as missing or incorrect lab values. It can be information that appears in the wrong section of a patient record; as missing information in a critical care summary when a provider needs to act; as scanned attachments that are not easily available to the care provider; and as providers unable to share basic details about patients' care.

In order to effectively manage care and improve health for complex patients, health and health care providers across the spectrum of care must have the ability to securely exchange information with other providers within the health care system, in compliance with patients' preferences. Currently, providers are not able to consistently provide the care that patients need, when and where they need it.

Providers participating in accountable care arrangements also face challenges related to lack of interoperability. As they increasingly are held financially accountable for producing quality outcomes, they need to effectively work with, and securely exchange data with, a broader range of care partners. When disparities exist between settings in regard to EHR adoption and resources for effective use and health information exchange, that coordination can't happen.

There are a number of factors that contribute to these challenges:

- Limited and unbalanced financial incentives to encourage adoption and use of HIT, especially in settings such as behavioral health, long-term and post-acute care, local public health, and social services that have not been eligible for federal financial incentives, resulting in disparities in adoption and effective use of certified or qualified EHRs in certain settings and for smaller rural providers.

- Inadequate technical assistance to support providers in adopting HIT, effectively using systems to support care, and training workforce to optimize systems and data analysis.
- Challenges to implementing health information exchange, including a complicated market-based approach to HIE implementation and governance, lack of leadership support for HIE, lack of clear standards for secure exchange, and costs for implementing and maintaining HIE transactions.
- Confusion about Minnesota's privacy and consent laws, lack of awareness of best practices for protecting patient data.
- Large disparities in the use of secure HIE across health and care settings, resulting in inability to effectively coordinate care, manage the health of populations, or participate in accountable care arrangements.

Recommendations

As part of its legislative mandate under Minnesota Statutes, Section 62J.495, the Commissioner of Health is directed to "recommend actions on policy and necessary resources to continue the promotion of adoption and effective use of health information technology" through this annual report. The recommendations below were developed in collaboration with the e-Health Advisory Committee, their workgroups, and consultation with stakeholders and subject matter experts.

These recommendations are intended to position Minnesota to remain an e-health leader in innovative, high-quality, efficient delivery of health and health care and address the challenges noted above. The recommendations include:

- **Increase adoption and effective use of EHRs for health providers beyond clinics and hospitals, with a focus on smaller settings and organizations, settings that lag in EHR adoption, and those that serve the underserved.** Strategies could include targeted financial and technical assistance, and development of guidance and best practices to adopt and effectively using EHRs to gap areas, including long-term and post-acute care, behavioral health, home care, local public health, dentistry, social services, and others.
- **Advance health equity through e-health** through development of an e-health framework to incorporate social determinants of health into the EHR.
- **Accelerate workforce training in health informatics and health IT** by advancing coordinated curriculum in colleges and universities, establishing health informatics job classifications, and local public health workforce education and training.
- **Monitor and assess Minnesota's e-health system** using a comprehensive approach to support EHR and HIE capability in all settings.
- **Support state and local government to meet requirements of the Interoperable EHR Mandate** by implementing a coordinated approach to secure HIE in MDH and other state government agencies and replacing numerous obsolete, non-standard systems with modern, shared data systems.

- **Strengthen privacy and security of patient health information** through development and dissemination of best practice models for conducting privacy risk assessments, and providing technical assistance, education and training for providers, EHR vendors and patients on the requirements of federal and state laws.
- **Advance use of health information exchange (HIE)** through grant funding, continued technical assistance, education and training, and HIE oversight. Strategies could include supporting providers and public health in establishing connections to certified HIE service providers, establishing standardized or shared HIE services to enable statewide interoperability, or other types of support.

Minnesota has achieved nation-leading progress for e-health yet significant gaps exist in small and rural settings, smaller clinics and ancillary services such as behavior health, long-term and post-acute care, and dental health, local and state public health. This section describes over 40 recommendations for collective actions to begin to address and close these gaps. Some of these challenges are technical in nature, but most are more health informatics or "human" factors and workflow related that require resources to learn, develop, and implement.

The Minnesota e-Health Initiative continually works to address these and other priorities. A more comprehensive description of many of these activities is in Appendix D.

Appendices

Appendix A: E-Health Profile of EHR Adoption, Use and Health Information Exchange

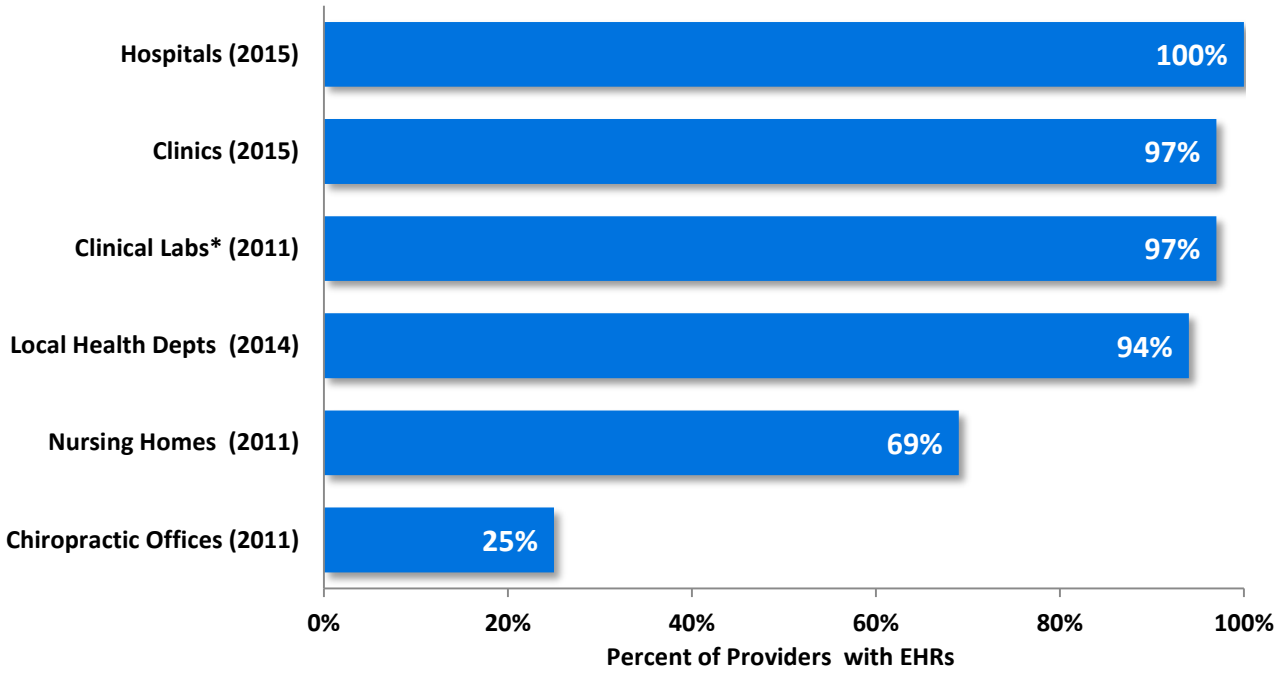
The Minnesota e-Health Profile is a series of studies of health care facilities that uniformly collects and shares the progress of Minnesota's health care providers in adopting, implementing and exchanging electronic health information. The assessment is designed to: measure Minnesota's status on achieving state and national goals relating to e-health and achieving interoperability; identify gaps and barriers to enable effective strategies and efficient use of resources; help develop programs and inform decisions at the local, state and federal levels of government; and support community collaboration efforts.

In 2015, OHIT conducted HIT assessment studies among Minnesota's hospitals, ambulatory clinics, and community health boards. Data for other health settings is provided from previous years' surveys. Minnesota continues to make great strides in advancing e-health in many settings, and evidence continues to grow regarding the positive impact of EHRs for Minnesota consumers, health care providers, and communities.

Adoption of electronic health records

Minnesota has some of the highest EHR adoption rates in the country[2] and for some settings, such as chiropractic offices, clinical labs and local public health departments; Minnesota is the only state in the nation to have a consistent methodology to measure EHR adoption rates. Exhibit A-1 shows adoption rates across health and health care settings.

Exhibit A-1: Percent of Minnesota Providers Using Electronic Health Records



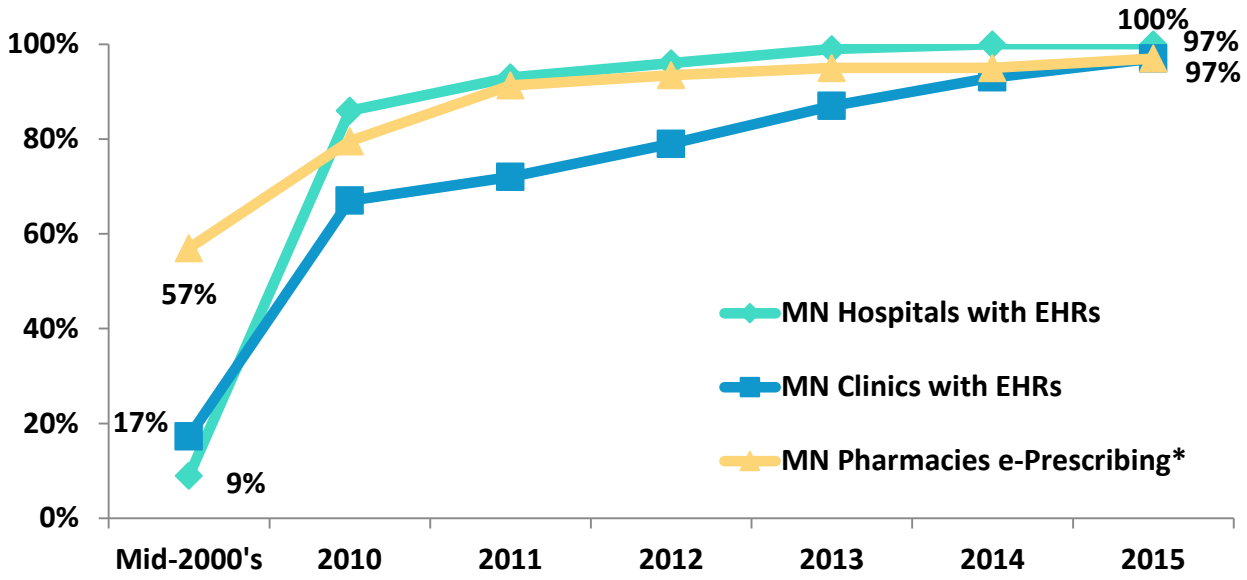
** Clinical Labs use lab information systems rather than EHRs*
Source: Minnesota Department of Health, Office of Health Information Technology, 2011-2015, http://www.health.state.mn.us/e-health/assessment.html

It should be noted that chiropractic offices, nursing homes, local health departments, and clinical labs have no or limited nationally certified EHR software available. This limits the use of standards and hinders effective use and interoperability. Looking forward, Minnesota should support EHR adoption, standards and certification for these settings and others such as specialty clinics, home health care organizations and dental offices.

[2] U.S Department of Health and Human Services, Office of the National Coordinator for Health IT, Health IT Dashboard. Accessed 11/16/2012

The adoption rate is very strong among hospitals, clinics and pharmacies (Exhibit A-2). While the rate of adoption is leveling off as it approaches 100%, there was tremendous progress in adoption over the past decade.

Exhibit A-2: Trends in EHR Adoption: Hospitals, Clinics, Pharmacies



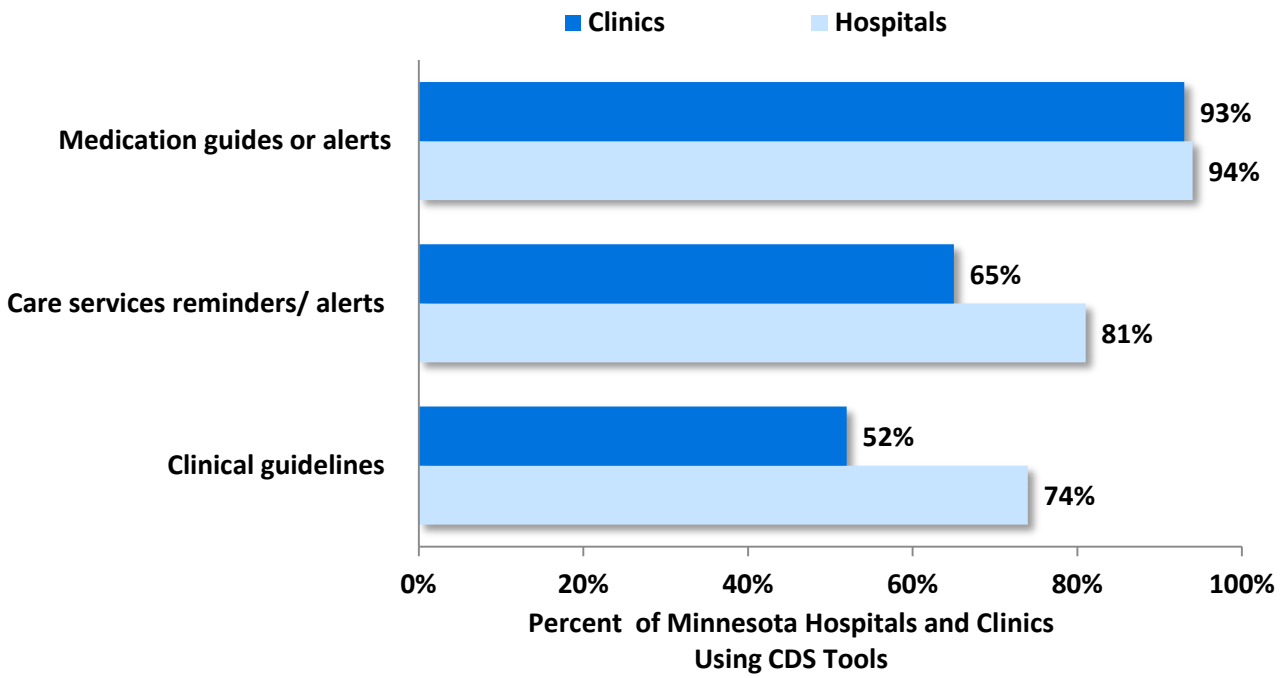
Source: Minnesota Department of Health, Office of Health Information Technology, http://www.health.state.mn.us/e-health/assessment.html, 2004-2015; Office of the National Coordinator, Surescripts
**Excludes pharmacies with the pharmacy class of medical device manufacturer*

Effective use of electronic health records

The real value from investing in and implementing an EHR system is optimizing how it can be used to support efficient workflows and effective clinical decisions. Effective use means that the EHR has tools such as computerized provider order entry (CPOE), clinical decision support (CDS) tools, and electronic prescribing, and there are processes in place to use these tools for improving health care. Achieving effective use is complex and is impacted by user behavior, organizational processes and practices, and EHR functionality.

Clinical decision support is defined broadly as providing clinicians or patients with clinical knowledge and patient-related information, intelligently filtered or presented at appropriate times, to enhance patient care. Exhibit A-3 shows key clinical decision support tool indicators in clinics and hospitals. The number of clinics and hospitals using these tools has increased over time, and earlier gaps between urban and rural rates of implementation have declined.

Exhibit A-3: Use of Clinical Decision Support Tools among Providers with EHR Systems

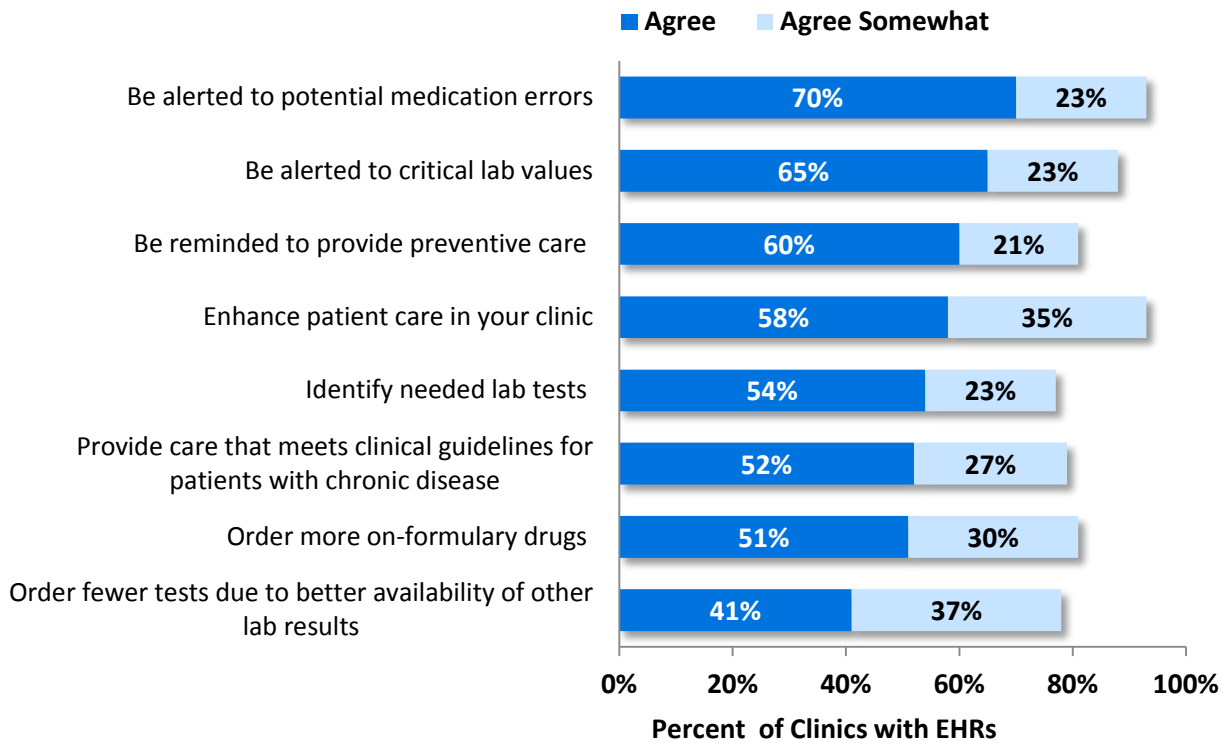


Source: Minnesota Department of Health, Office of Health Information Technology, 2014-2015, http://www.health.state.mn.us/e-health/assessment.html

Impact of EHRs on clinical practice

The clinic HIT study includes some opinion questions regarding the impact EHRs have had on the clinic's practice. There is strong agreement on the positive impact of EHRs, particularly on two important measures: more than nine in ten clinics agree that the EHRs have alerted their providers to potential medication errors, and that they have enhanced patient care. Furthermore, agreement is strong on all of items shown in Exhibit A-4.

Exhibit A-4: Impact of EHRs on Clinic Practice, 2015



Clinic N = 1,146 MN primary and specialty care clinics with EHR
Source: Minnesota e-Health Profile, MDH Office of Health IT, 2015, http://www.health.state.mn.us/e-health/assessment.html

E-prescribing

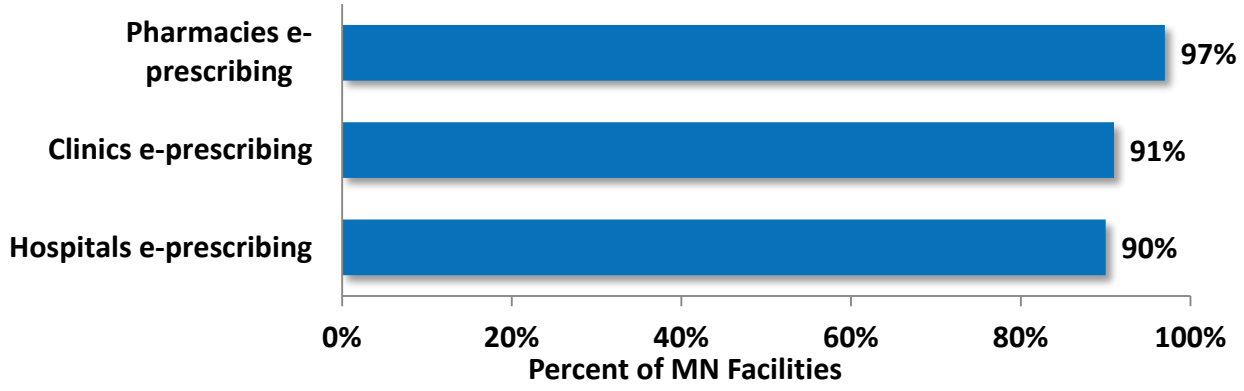
Electronic prescribing, or "e-prescribing," means secure bi-directional electronic information exchange between prescribing providers, pharmacists and pharmacies, and payers or pharmacy benefit managers. E-prescribing can improve the quality of patient care because it enables a provider to electronically send an accurate and understandable prescription directly from the point-of-care to a pharmacy. E-prescribing is a way to:

- Improve the quality, safety and cost-effectiveness of the entire prescribing and medication management process.
- Reduce potential adverse drug events and related costs.

- Reduce burden of callbacks and rework needed to address possible errors and clarify prescriptions.
- Increase efficiency of the prescription process and convenience for the patient/consumer.

As a result of the e-prescribing mandate enacted in 2011, Minnesota has seen a dramatic increase in the rate of pharmacies e-prescribing, from 57% in December of 2008 to 97% in 2015. Minnesota measures the status of e-prescribing in several ways, including pharmacy and provider e-prescribing practices. Exhibit A-5 show high rates of adoption among pharmacies (97%), clinics (91%) and hospitals (90%). Despite these high rates of e-prescribing, many clinics and hospitals struggle with barriers to e-prescribing due to systems that do not provide appropriate security functionality for e-prescribing of controlled substances. These barriers are expected to diminish over time.

Exhibit A-5: Use of E-Prescribing Among Minnesota Pharmacies, Hospitals and Clinics, 2015



Source: Minnesota e-Health Profile, MDH Office of Health IT, 2014-15; Surescripts 2015.

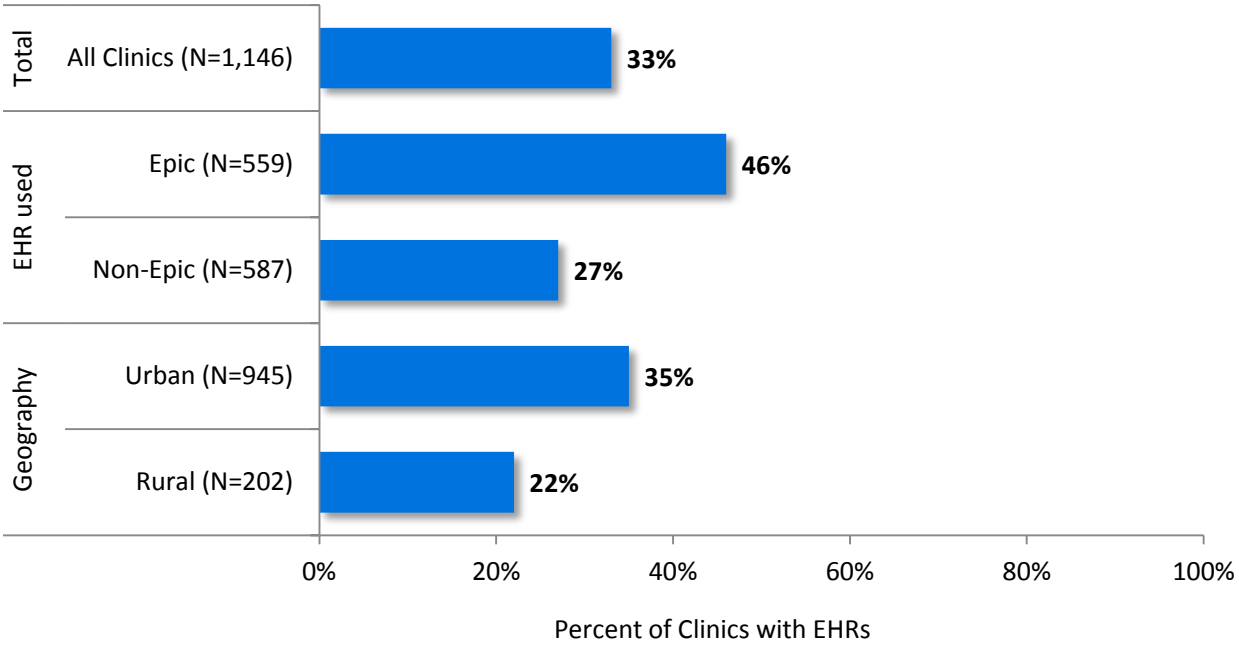
In February 2015, OHIT published "A Practical Guide to Electronic Prescribing, Edition 2". This guide supports prescribing providers, pharmacists and pharmacies, payers/pharmacy benefit managers and others to achieve the quality and safety benefits of e-prescribing, and to support compliance with Minnesota law. The Minnesota e-Health Initiative published the first edition of this guide in 2009 and since that release, adoption of e-prescribing has grown dramatically. Over time, there have been regulatory changes, technology updates, and unresolved workflow issues that potentially affect patient health and safety. In 2014, a group of Minnesota's e-prescribing stakeholders raised issues to the Institute for Clinical Systems Improvement (ICSI) and the Minnesota e-Health Initiative about unintended consequences of these changes and issues. As a result, the Initiative formed a workgroup to study these issues to understand the gaps, barriers, and opportunities, and to provide expert input on updates presented in the guide.

Providers using Health Information Exchange

The number of Minnesota hospitals and clinics exchanging health information is slowly increasing, with 73% of clinics and 77% percent of hospitals electronically exchanging any type of health information with unaffiliated clinics and/or hospitals. However, electronic exchange of key clinical care information is not common. Exhibit A-6 shows that one-third of clinics (33%) were electronically sending or receiving summary of care records for at least half of patients who require transition to/from another facility or referral to/from another provider. This type of record provides a summary of the patient's information in a standardized format, and is a meaningful use requirement for clinics and hospitals.

Furthermore, data show evidence that most of the health information exchange happening in Minnesota is primarily between hospitals and clinics in the same health system or with systems that use the same EHR. As an example, Exhibit A-6 shows that 46% of clinics using Epic are exchanging summary of care records routinely. There is also a disparity in exchange of these records by geography, with 35% of urban and 22% of rural clinics routinely exchanging summary of care records.

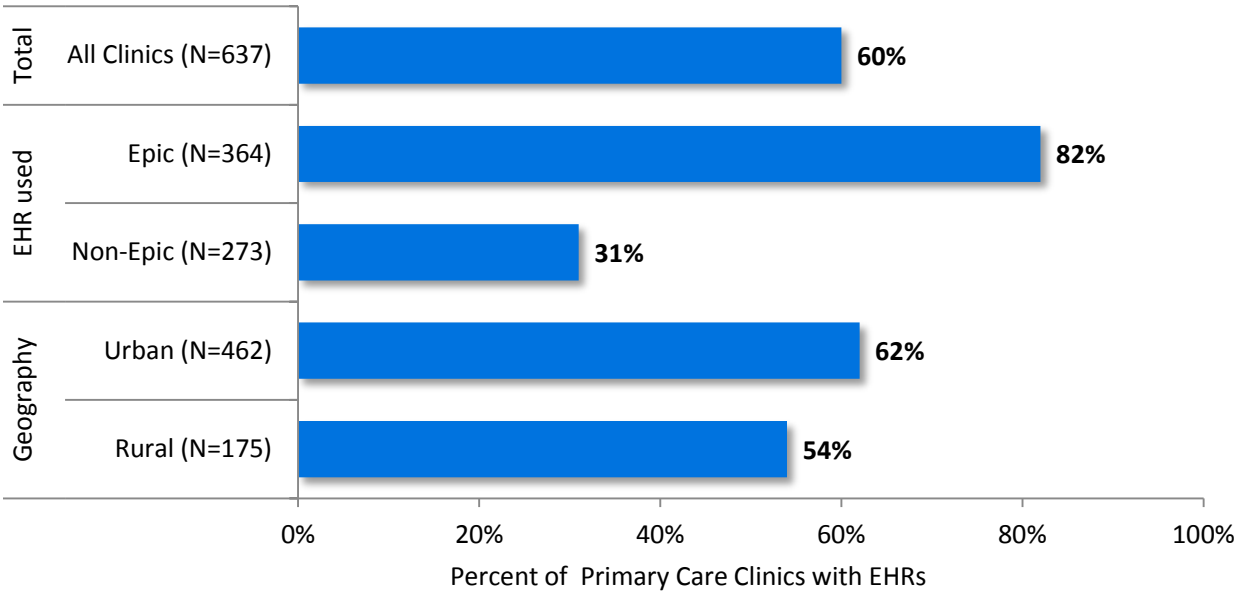
Exhibit A-6: Use of Electronic Summary of Care Records for 50% or More of Patients Who Require Transition or Referral, 2015



Source: Minnesota Department of Health, Office of Health Information Technology 2015, http://www.health.state.mn.us/e-health/assessment.html.

Another important HIE transaction is automated electronic alerts from hospitals to the primary care provider when a patient enters the emergency department, or is admitted to or discharged from the hospital. Exhibit A-7 shows that 60% of Minnesota's primary care clinics received these electronic alerts from hospitals in 2015. However, a there is a very large disparity in receipt of these notices based on the EHR system used. For example, 82% of primary care clinics using Epic report that they receive these alerts, compared to 31% of primary care clinics that use another EHR system. There is also a disparity by geography, with 62% of urban compared to 54% of rural primary care clinics receiving these alerts.

Exhibit A-7: Primary Care Clinics' Receipt of Automated Alerts from Hospitals, 2015



Source: Minnesota Department of Health, Office of Health Information Technology 2015, http://www.health.state.mn.us/e-health/assessment.html.

Appendix B: Minnesota e-Health Advisory Committee

The Minnesota e-Health Advisory Committee is a 25-member legislatively authorized committee appointed by the Commissioner of Health to build consensus and advise on policy and collaborative action needed to advance the adoption and effective use of EHRs and health information exchange needed to advance Minnesota e-Health vision. The committee is comprised of key stakeholders who represent the spectrum of Minnesota's health community, including providers, payers, public health, researchers, vendors, consumer, and more.
For the past eleven years the e-Health Initiative, led by the Minnesota e-Health Initiative Advisory Committee and the MDH Office of Health Information Technology (OHIT), has pushed for and supported e-health across the continuum of care; as a result, Minnesota is a national leader in implementation and collaboration. A listing of current Advisory Committee Members is provided later in this Appendix.

Workgroups

Committee members participate in workgroups to dive into detailed topics such as privacy and security, health information exchange, and standards and interoperability. The workgroups are the primary vehicle for receiving public input and investigating specific e-health topics through discussion and consensus building. Each workgroup has a charter declaring the purpose, schedule, deliverables, and co-chairs that guide the process. The co-chairs and workgroup participants contribute subject matter expertise in discussions, research and analyses through hundreds of hours of volunteer time. OHIT staff facilitate, analyze and interpret data, and summarize findings that will contribute to e-health policy development. Workgroup participants are recruited statewide and are open to the public via in-person meetings and dial-in options.

Minnesota e-Health Initiative Milestones

2004 Convened the Minnesota e-Health Initiative Steering Committee, a public-private collaboration with representatives from representatives from hospitals, health plans, physicians, nurses, other healthcare providers, academic institutions, state government purchasers, local and state public health agencies, citizens, and others with expert e-health knowledge. This committee developed a roadmap and preliminary recommendations to address the many challenges, gaps and opportunities for Minnesota.

2005 Minnesota e-Health Initiative is formally establish in Minnesota Statutes, section 62J.495. At this time approximately 17% of clinics and 9% of hospitals in Minnesota had adopted EHRs.

2007 Governor Pawlenty declares "Comprehensive reform this year should move Minnesota toward an interoperable electronic health record system." (State of the State Address, January 17, 2007). Minnesota's Interoperable EHR mandate is passed into law (§62J.495), requiring providers in Minnesota to adopt an interoperable EHR by January 1, 2015.

2008 The Minnesota Legislature enacted the electronic prescribing mandate, requiring all prescribers, pharmacies and payers to participate in electronic transmission of prescriptions by January 1, 2011. The Minnesota e-Health Initiative developed and published the "Statewide Plan to Achieve the EHR Mandate".

2009 On February 17, 2009, President Obama signed the American Recovery and Reinvestment Act of 2009 (ARRA). A portion of the law creates the Health Information Technology for Economic and Clinical Health Act, or the HITECH Act. The objective is to ensure that the adoption and use of health IT contributes to a more efficient, effective and safe health care system that achieves improved health outcomes.

2010 Minnesota received federal $65 million in HITECH funding under the State HIE Cooperative Agreement Program and four other programs in the state. This was the highest single-state award in the nation. CMS's EHR incentive program also began this year.

2011 Minnesota's electronic prescribing mandate took effect on January 1. By end of year, Minnesota received the National Safe Rx Award. By end of this year Minnesota's hospitals and clinics also led the country in EHR adoption rates.

Glacial Ridge Health System in Glenwood is the first Minnesota hospital to attest for meaningful use.

2013 Minnesota was awarded a $45 million as part of the State Innovation Model program of the Center for Medicare & Medicaid Innovation.

2014 The Minnesota e-Health Initiative celebrated its 10-year anniversary.

2015 The Minnesota Legislature updated three key components of the Minnesota e-Health Initiative, including: 1) extension of the e-Health Advisory Committee until June 30, 2021, 2) exemption from the Interoperable EHR Mandate for individual healthcare providers in a solo, private practice, and for those who do not accept reimbursement from a group purchaser; and 3) updates to the Minnesota HIE Oversight Law to streamline the certification process, fee structure, and update statutory definitions.

Minnesota e-Health Advisory Committee Members, 2015-16

Alan Abramson, PhD, *Advisory Committee Co-Chair*, Senior Vice President, IS&T and Chief Information Officer HealthPartners Medical Group and Clinics
Representing Health System CIOs

Daniel Abdul, Chief Information Officer UCare
Representing Health Plans

Sunny Ainley, Associate Dean, Center for Applied Learning Normandale Community College
Representing: HIT Education and Training

Constantin Aliferis, MD, MS, PhD, FACMI, Chief Research Informatics Officer, University of Minnesota Academic Health Center
Representing: Academics and Clinical Research

Wendy Bauman, MPH, Deputy Director, Dakota County Public Health
Representing: Local Public Health Departments

Jeff Benning, MBA, President and CEO, Lab Interoperability Collaborative
Representing: Expert in HIT

Laurie Beyer-Kropuenske, JD, Director Community Services Divisions
Representing: Minnesota Department of Administration

Lynn Choromanski, PhD, RN-BC Nursing Informatics Specialist, MVNA
Representing: Nurses

Maureen Ideker, MBA, RN Director of Telehealth Essentia Health
Representing: Small and Critical Access Hospitals

Mark Jurkovich, DDS, MBA, Dentist, Gateway North Family Dental
Representing: Dentists

Paul Kleeberg, MD, *Advisory Committee Co-Chair*, Medical Director, Aledade
Representing: Physicians

Ruth Knapp, Manager, Health Data Quality, Minnesota Department of Human Services
Representing: Minnesota Department of Human Services

Marty LaVenture, PhD, MPH, FACMI, Director Office of Health IT and e-Health, Minnesota Department of Health
Representing: Minnesota Department of Health

Jennifer Lundblad, PhD, President and Chief Executive Officer, Stratis Health
Representing: Quality Improvement

Bobbie McAdam, Senior Director, Business Integration Medica
Representing: Health Plans

Kevin Peterson, MD Family Physician Phalen Village Clinic
Representing: Community Clinics and FQHCs

Peter Schuna, Director of Strategic Initiatives, Pathway Health Services
Representing: Long Term Care

Jonathan Shoemaker, Information Services Director of Clinical Application, Allina Health
Representing: Large Hospitals

Trisha Stark, PhD, LP, MPA, Licensed Psychologist
Representing: Behavioral Health

Meyrick Vaz, Vice President, Healthcare Solutions Optum Global Solutions
Representing Vendors

Cally Vinz, RN, Vice President, Health Care Improvement Institute For Clinical Systems Improvement
Representing: Clinical Guideline Development

Donna Watz, JD, Deputy General Counsel, Minnesota Department of Commerce
Representing: MN Department of Commerce

John Whittington, South Country Health Alliance
Representing: Health Care Purchasers and Employers

Ken Zaiken, Consumer Advocate
Representing: Consumers

Charlie Montreuil, Vice President, Enterprise Rewards and Corporate Human Resources, Best Buy Co., Inc.
Representing: Health Care Purchasers

Designated Alternates

Sarah Cooley, MD, MS, Assistant Professor of Medicine, Division of Hematology, Oncology and Transplantations, University of Minnesota
Alternate Representing: Clinical Research

Kris Dudziak, CHCE, Senior Manager Business Operations, Home Care, Hospice, and Geriatric Services, HealthPartners Medical Group and Clinics
Alternate Representing: Experts in HIT

Cathy Gagne, RN, BSN, PHN, St. Paul-Ramsey Department of Public Health
Alternate Representing: Local Public Health

Nancy Garrett, PhD, Chief Analytics Officer, Hennepin County Medical Center
Alternate Representing: Large Hospitals

Kathy Messerli, Executive Director, Minnesota HomeCare Association
Alternate Representing: Home Care

Mark Sonneborn, Vice President, Information Services, Minnesota Hospital Association
Alternate Representing: Hospitals

Susan Severson, Director, Health IT Services, Stratis Health
Alternate Representing: Quality Improvement

Steve Simenson, BPharm, FAPhA, President and Managing Partner Goodrich Pharmacy
Alternate Representing: Pharmacists

Kathy Zwieg, Associate Publisher & Editor-in-Chief, Inside Dental Assisting Magazine
Alternate Representing: Clinic Managers

Appendix C: State Innovation Model e-Health Programs

To help achieve the Triple Aim many states are experimenting with accountable models of health care delivery, and Minnesota has been exploring this model since the state's 2008 health reform legislation. In 2013, the Minnesota Department of Human Services (DHS) and MDH were awarded a $45 million State Innovation Model (SIM) grant from the Center for Medicare and Medicaid Innovation (CMMI) to test the Minnesota Accountable Health Model (the Model).[3] The Model will test new ways of delivering and paying for health care to improve health in communities, provide better care, and lower health care costs. It will build upon the current Minnesota Medicaid ACO models—the Integrated Health Partnerships (IHP) program, a Medicaid ACO program administered by DHS, and the Hennepin Health demonstration project—to increase the percentage of Medicaid enrollees and other populations included in ACOs under shared savings/shared risk payment arrangements. These ACOs will focus on the development of integrated community service delivery models and coordinated care models bringing together health care, behavioral health, long term supports and services, and community prevention services that are coordinated and centered around patient needs. The Model will test the next logical step toward providing and paying for value-based care and achieving the Triple Aim by expanding ACOs under a multi-payer approach. There are five drivers associated with the Model:

Driver 1	HIT/HIE: Providers have the ability to exchange clinical data for treatment, care coordination, and quality improvement.
Driver 2	Data Analytics: Providers have analytic tools to manage cost/risk and improve quality.
Driver 3	Practice Transformation: Expanded numbers of patients are served by team-based integrated/coordinated care.
Driver 4	Accountable Communities for Health (ACH): Provider organizations partner with communities and engage consumers, to identify health and cost goals, and take on accountability for population health.
Driver 5	ACO Alignment: ACO performance measurement, competencies, and payment methodologies are standardized, and focus on complex populations.

[3] Minnesota State Innovation Model Grant web page: http://mn.gov/sim

E-health and the Minnesota Accountable Health Model

E-health is a critical component of accountable care, in that it supports the safe, accurate and efficient exchange of information between the care team. OHIT's role with the SIM program is to support the Model by developing tools and roadmaps for providers to establish the e-health infrastructure to participate in an ACO, and providing funding for planning and implementation. Building on the successes of past activities, OHIT will work to build capability and capacity for e-health across the continuum of care and within ACOs to identifying opportunities to improve care coordination, health outcomes, and promote healthier communities. Efforts are directed toward three initiatives:

1. **E-Health Grant Program**: To support readiness for and participation in the Minnesota Accountable Health Model by providing funding to support the secure exchange of medical or health-related information between organizations for: a) developing a plan to participate in the Model; or b) implementing and expanding e-health capabilities for participation in the Model.
2. **E-Health Roadmaps to Advance the Model**: To develop and disseminate the Minnesota e-Health Roadmap to Advance the Model for the settings of long-term and post-acute care, local public health, social service, and behavioral health.
3. **Privacy, Security and Consent Management for Electronic Health Information Exchange**: For the review of e-health legal issues, analysis and identification of leading practices, technical assistance, and education.

E-health Grants

The specific goal of this grant program is to support the secure exchange of medical or health-related information between organizations participating in an accountable care models so that it occurs in a more seamless and real-time way across settings. The SIM program had two rounds of grant funding to support HIE.

Selected community collaboratives received 12-month development or 18-month implementation grants. The grants are designed to help care team members from clinical, community, and social service settings use HIE and health information technology to better meet the health needs of patients and community members.

Collaboratives include at least two organizations with one (or two for Round 2 grantees) partner(s) from local public health, long-term and post-acute care, behavioral health or social services. In addition, the organizations must be participating in (or planning to participate in-Round 1 option) an accountable care organization (ACO) or similar care delivery model involving payment alternatives to fee-for-service, such as shared risk, shared savings, or total cost of care.

The grant program was designed to support: expanded HIE to SIM-Minnesota priority settings (long-term and post-acute care, behavioral health, local public health and social services); effective HIE use to improve care coordination, health care and population health and readiness to advance the Minnesota Accountable Health Model and accountable communities

for health.
Grant for almost five million dollars were awarded. Development grants up to $75,000 went to six collaboratives, including:

- Integrity Health Network (Duluth), $ 65,885
- Medica Health Plans (Minnetonka), $ 75,000
- Fairview-Ebenezer (Minneapolis), $ 75,000
- White Earth Nation (White Earth), $ 75,000
- Lutheran Social Service (St. Paul), $ 75,000
- Wilderness Health (Two Harbors), $ 75,000

Implementation grants up to $897,000 were awarded in Round 1 to 5 collaboratives. Four Round 2 implementation grants, up to $348,000, were awarded. Implementation grants for both rounds include:

- Touchstone Mental Health (Minneapolis), $ 567,597
- Southern Prairie Community Care (Marshall), $ 897,780
- Winona Health (Winona), $ 265,950 and $ 245,000
- FQHC Urban Health Network (St. Paul), $ 440,970
- Northwestern Mental Health (Crookston), $ 749,323
- Otter Tail County Public Health (Fergus Falls), $ 483,565
- Integrity Health Network (Duluth), $ 222,748
- Lutheran Social Service (St. Paul), $ 348,169
- Beltrami Area Service Collaborative (Bemidji), $ 201,409

E-health Roadmap

The purpose of the Minnesota e-Health Roadmap for Behavioral Health, Local Public Health, Long-Term and Post-Acute Care, and Social Services (Roadmap) is to provide recommendations and actions to support and accelerate the adoption and use of e-health. The Roadmap will emphasize the future state of using e-health in these priority settings to improve health outcomes. In addition, it will:

- Enhance a provider's ability to give better care through improved communication between all providers, as well as individuals and their families.
- Support individuals' access to their health information and engagement in their care and health.
- Make recommendations to the Minnesota e-Health Initiative on key information and functionality needs for EHRs and HIE.
- Provide recommendations on policies and actions to support e-health across the care continuum to state and federal policymakers, agencies, and organizations.
- Identify evaluation and applied research opportunities to advance e-health.

The Roadmap is primarily for use by providers and organizations that represent the priority settings of behavioral health, local public health, long-term and post-acute care, and social services. Others who might want to use the Roadmap are:

- Professional and trade associations that can help disseminate and implement the recommendations.
- Other health and care providers and organizations, including EHR and HIE vendors, impacted by the recommendations.
- Policymakers and leaders interested in e-health and its contribution to health transformation and high-quality, coordinated care.
- Persons interested in how e-health is impacting health and care of individuals and communities.

The Roadmap project, occurring January 2015 – June 2016, is a collaborative effort led by OHIT and Stratis Health. A consensus-based approach is used to create the Roadmap through stakeholder engagement, including:

- A Steering Team that provides overall guidance to the Roadmap, assuring alignment between the workgroups and other e-health and health reform activities, and communication with all stakeholders.
- Workgroups for each priority setting that provide expert input to support the Roadmap development and ensure all stakeholder needs are fully considered.
- Reviewer/Subject Matter Experts that review and provide feedback on key materials.

- A Community of Interest that receives periodic communications on the Roadmap and related e-health activities.

The Roadmap has three phases: plan, develop, and educate. These three phases will support and accelerate the adoption and use of e-health but will not include implementation guides or detailed directions for individual providers and organizations to implement an EHR or HIE.

Privacy, Security and Consent Management for HIE

The specific goal of this grant program is the secure exchange of medical or health-related information between organizations participating in an accountable care models so that it occurs in a more seamless and real time way across settings (clinic/hospital/long-term and post-acute care/behavioral health/local public health/ social services) in the presence of strong policy and legal framework.
Selected grantees received awards to provide legal analysis, education, and other resources to support providers in meeting state and federal privacy and security requirements for health information exchange. The grant program is designed to:

- Ensure that providers in all health settings have the access to the knowledge and tools required to use, disclose and share health information in a safe and secure manner.

- Ensure that providers in all health settings have access to education and technical assistance on privacy, security and consent management practices that are based on both the Health Insurance Portability and Accountability Act (HIPAA) and Minnesota Statutes.

- Identify opportunities to improve current patient consent processes for the release of protected health information required for health information exchange

- Provide access to education and technical assistance for providers in all health settings on implementing leading practices for enabling safe and secure electronic health information exchange across multiple and diverse health care settings for the purpose of care coordination activities. This includes, but is not limited to: consistent and uniform policies and procedures.

Grants were awarded to Gray Plant Mooty for Review of e-Health Legal Issues, Analysis and Identification of Leading Practice and to Hielix, Inc. for e-Health Privacy, Security and Consent Management Technical Assistance and Education.

Appendix D: Minnesota e-Health Initiative Priority Activities for 2016

OHIT and the Initiative address a variety of topics and activities. These topics are typically brainstormed and prioritized in August of each year as part of the Initiative's planning process. Priority activities for 2016 are described below.

Advance Health Information Exchange and Interoperability through the Minnesota e-Health Health Information Exchange Workgroup

In 2016, the Health Information Exchange Workgroup will produce the following deliverables:

- A summary of recommended actions (e.g., guidance, best practices or policy actions) to address key barriers to implementing HIE and achieving interoperability.
- Develop a framework for strategic approach and recommended actions for implementing specific transactions (e.g., care transition alerts).
- Review and validate the Minnesota HIE Framework and Guidance to Support Accountable Health.
- Review and validate update *A Practical Guide to Understanding Health Information Exchange, Assessing Your Readiness and Selecting HIE Options in Minnesota.*

Support Patient Preferences and Providers in Protecting Patient Privacy and Security through the Minnesota e-Health Privacy and Security Workgroup

In 2016, the Privacy and Security Workgroup will be providing the following deliverables:

- Develop consensus and a summary of comments on legal analysis provided by Gray Plant Mooty.
- Endorse educational materials provided by Hielix, Inc.
- Provide a list of identified needs and key barriers on security topics and advice on next steps.

Advance Knowledge and Understanding of e-Health Capabilities and Challenges through Data Collection of Providers Across the Care Continuum

E-health is an evolving topic, and an important step in this evolution is to learn from measuring. The Initiative has systematically measured e-health adoption and utilization among Minnesota's hospitals, clinics, and local health departments annually since 2010. Additional health care settings have been assessed periodically. While some e-health concepts are well-established and measured with confidence, other concepts are evolving and are difficult to measure; e.g., health information exchange and interoperability.

OHIT will continue to assess e-health in Minnesota, including assessment across additional heath care settings, alternative measures for interoperability, and identifying advance uses of e-health. One example is a project to understand how health providers are using their clinical

EHR data for purposes other than direct clinical care. Some of these uses include research, quality measurement, care coordination, community health assessment, and fiscal reporting.

Understand Lessons Learned from Implementation of Minnesota's SIM Grant to Identify Areas of Future Need and Sustainability

As we reach the final year of Minnesota's three-year SIM grant, important information has been learned about the expanding Minnesota's Accountable Health Model and it's underlying e-health supports, capabilities and infrastructure needs. These are critical to meet the emerging requirements for a health system that is coordinated, ensures providers have the information they need about their patients to provide high quality care, and is reimbursed based on value rather than volume.

Some of the areas we expect to learn and synthesize into future sustainability needs will likely include efforts to:

- Support the e-health vision across the entire health and health care continuum by assisting providers in meeting Minnesota's interoperable EHR minimum requirements, while expanding our understanding and support of emerging e-health needs, as described in Minnesota HIE Framework and Guidance to Support Accountable Health. The vision of being inclusive of the entire health and health care continuum is a necessary principle for advancing Minnesota's goals around health equity.

- Identify implementation needs of the Minnesota e-Health Roadmap for Behavioral Health, Long-Term and Post-Acute Care, and Social Services. Significant consensus has been built in 2015 and will continue into 2016 regarding key priority actions and recommendations for these important priority setting's achievement of e-health. More investments will be needed at the organization level (e.g., an individual behavioral health provider), the setting level (e.g., the associations that support a particular setting); and the statewide level (e.g., through statewide education and technical assistance). As such, we will identify the future needs so that Minnesota can realize the potential that these settings bring to a coordinated health care system through e-health.

- Address ongoing privacy and security needs as Minnesota providers continue to understand differences between Minnesota and Federal laws. Minnesota providers want to comply with the various requirements around privacy, security, and consent, but many do not have resources to hire the expertise needed to understand the various laws and to implement best practices within their setting.

- Better understand the value of investments in e-health and the impact of various aspects on the ability to succeed at health information exchange in Minnesota. Those aspects include, but are not limited to: Minnesota's market-based model for HIE, Minnesota's laws regarding privacy and security, technical infrastructure needs for statewide interoperability, financing of health information exchange services, and commitment by all stakeholders to participate in health information exchange to create a health information exchange environment that is viable, sustainable, and that provides value. See Appendix E for more detail on health information exchange.

Support MDH and Public Health Interoperability

Programs at MDH are experiencing an increasing demand from health care providers to stay current with the private sector trends of electronically moving health information using national standards and in a more coordinated and efficient way. Demands for fast access to health information to address public health needs are rising rapidly. Local public health and other health care providers are calling for greater access to electronic public health data to improve response to health threats, support quality and safety, reduce costs, and more effectively target public health interventions to improve health. More broadly, MDH customers are quickly moving towards electronic means of communication and are demanding to conduct business electronically for other core functions - including grants, licensing, and health education - through electronic, easy-to-access, uniform, and transparent tools and systems.

Minnesota's Interoperable EHR mandate requires all health care providers to have an interoperable electronic health record and be connected to a State-Certified Health Information Exchange entity. The mandate applies to public health, both as a provider of health care and as a receiver of client-based information from health care providers. This 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 four metropolitan cities.

Current state law also requires the reporting of public health data to MDH including, but not limited to, notifiable conditions laboratory reporting, infectious diseases, and immunizations. MDH's collection, reporting, and public health action on information gained through its public health reporting systems are the foundation for meeting its mission and its statutory role.

Despite these requirements, MDH's information systems are in varying states of readiness to accept, process, and exchange data with providers interested in reporting electronically and to do so in a coordinated way with our customers. To ensure that providers are able to effectively and securely exchange public health data with MDH, many of the department's systems must be updated or replaced. In 2016, MDH will continue clarifying its strategic vision and roadmap to adopt the e-health standards, processes, and information systems to meet the current public health needs.

Appendix E: Health Information Exchange

Health information exchange (HIE) is the secure electronic exchange of clinical information between organizations using nationally recognized standards (Minn. Stat. §62J.498 sub. 1(f)). The goal of health information exchange is to help make health information available, when and where it is needed, to improve the quality and safety of health care and improve population health. In Minnesota, many efforts are underway to help achieve the secure electronic exchange of clinical information between organizations using nationally recognized standards. Other than electronic prescribing, most of the health information exchange happening in Minnesota is primarily between affiliated hospitals and clinics or those using the same EHR system. Federal requirements through meaningful use now requires more health information exchange happen with unaffiliated partners or partners on different EHR systems.

HIE landscape in Minnesota: a market-based strategy with limited government oversight

Minnesota's approach to health information exchange has been to support a market-based strategy for secure HIE that allows for private sector innovation and initiative, yet uses government oversight to ensure fair practices, sustainability and compliance with state and federal privacy, security and consent protections.

Minnesota health care providers are required by law to have an interoperable electronic health record system that is connected to a state-certified health information exchange entity (M.S. 62J.495). Minnesota's Health Information Exchange (HIE) Oversight Program (M.S. 62J.498-4982) was established to ensure that all Minnesota health care providers can exchange patient data securely and seamlessly, following state and national standards, to provide high quality care for patients, reduce costs, support healthy communities, and meet Minnesota's interoperability requirements. Under the oversight law, MDH certifies vendors that provide a range of HIE services, to ensure that these standards and requirements are met.

Minnesota's HIE oversight law passed in 2010 and subsequently updated in 2015, provides a governance framework to ensure that a patient's electronic information securely follows them across the full continuum of care. OHIT manages this oversight role by monitoring national and state HIE activities, certifying HIE service providers that provide HIE products and/or services in Minnesota, and providing education and technical assistance to applicants on the certification process. The certification process is intended to promote public trust in interoperability activities, decrease fragmentation of health information in the state, and provide a state strategy for community-based interoperability through the use of State-Certified HIE Service Providers. This framework will help prevent fragmentation, encourage collaboration between market partners, and ensure the use of HIE national standards so that data integrity is maintained and information is shared in a safe, secure manner.

Health Information Exchange Barriers

OHIT has collected information from a variety of sources related to challenges and barriers to HIE. Many of the challenges are not unique to Minnesota; however, the high level of electronic health record adoption in Minnesota as well as some unique differences from other states may be contributing to greater awareness of the challenges.

Below are common themes identified related to HIE in Minnesota:

- Business case need
  - For some provider groups, there is not strong business case for HIE while for others there is a strong business case – creating tension between those who want to share data and those that do not.
  - The costs of HIE outweigh the perceived benefit and many providers are uncertain how they might sustain HIE activities once grant funding goes away, especially if HIE is not widely adopted statewide.
  - The Epic EHR platform is used by 50% of hospitals and clinics in Minnesota, yet there is little participation by these systems in HIE among users of other EHR systems.
- Competing priorities
  - Resources for implementing HIE compete with resources for implementing other priorities, including EHR requirements for meaningful use, ACO formation, deploying ICD-10, and others.
- Partner relationships to support care coordination/HIE are difficult to form
  - There is some difficulty among exchange partners in coming to agreement on exchanging health information or seeing the benefits. Developing consensus between partners takes time and is challenging.
- Workforce skill sets
  - There is need for organizational leadership and staff with the right skill sets to implement HIE. These are more than just technical skills, but also legal/policy, relationship-building, health informatics, and governance.
- Policy and legal considerations
  - Providers face challenges in implementing MN consent laws due to the stringent requirements and ambiguity of the Minnesota Health Records Act, as well as the costs to securely implement consent management.
  - Providers struggle to understand Minnesota's HIE approach. There is lack of clarity whether a "market-based" approach is ideal or if a singular exchange would be better.
- Implementation challenges

  - Provider workflow changes are disruptive, especially without adequate resources for implementing HIE.
  - Providers, especially those outside of acute and ambulatory care, need guidance for implementing practice changes for HIE.
- Technical challenges
  - There are challenges identifying appropriate vendors due to a wide array of options and variation in capabilities needed across various health settings. Agreement is needed for interoperable standards across settings and vendors.
  - Providers have a need for common shared and standardized services, such as a shared directory of providers to facilitate HIE. At this time, it is unknown what shared services are needed and persistent evolution of the HIE market provides challenges in understanding how to implement these services.
- Opportunity to advance select priority transactions
  - There is some agreement that electronic notifications, such as transition of care alerts, provide high impact for care coordination and cost containment. However, Minnesota providers do not have a collective commitment to implement these transactions.
  - Providers need guidance and technical assistance to implement HIE transactions.
- Rapidly changing HIE service provider market
  - Minnesota's HIE market continually evolves based on national trends with HIE (e.g., more EHR vendors are providing HIE services, more advanced capabilities, consolidations, startups).
  - Providers need guidance and technical assistance for HIE services selection.
- Educational resources and practical guidance materials targeted at health and health care provider organizations are needed addressing all of these challenges
  - Broad education / communications about e-health and HIE are needed.
  - Individual organization technical assistance is also needed, especially by smaller providers or settings that have not received federal financial incentives.

The Minnesota e-Health Initiative Health Information Exchange Workgroup, in the 2015-2016 year, is currently in process of developing recommendations for collaborative action to address these barriers through collaborative action.

Appendix F: E-health Standards

E-health standards are essential to ensure the effective use of electronic health records (EHRs) and to successfully achieve interoperability of health information. E-health standards are a crucial factor to achieve Minnesota's health goals, including goals around advancing health equity, lowering health care costs, and improving patient health outcomes.

Some examples where e-health standards are essential include:

- Providing physicians and patients with medical alerts for issues such as potential adverse drug to drug interactions.
- Monitoring and comparing lab tests over time, no matter where the test was done, and enabling patients to see lab results online.
- Sending complete clinical information for a smooth patient transition from a hospital to other settings.
- Providing rapid electronic transmission of a patient's prescriptions to a pharmacy of the patient's choice.
- Having a complete immunization history available for providers to determine what shots are needed for a patient.
- Alerting the community during public health threats and outbreaks.

Identifying and implementing appropriate standards is a complex and ongoing activity. The National Library of Medicine catalogs more than a one thousand e-health standards and code sets. Some national initiatives have stepped up to provide direction on the development and use of standards. The Minnesota e-Health Initiative has also actively addressed standards considered important for our health community. These initiatives are described below.

National e-Health Standards Resources

The Office of the National Coordinator (ONC) for Health Information Technology develop the Interoperability Standards Advisory in 2015 and will provide annual updates based on community input each year (https://www.healthit.gov/standards-advisory). This advisory represents current thinking on best available standards and implementation specifications, and is updated annually. The purpose of the advisory is to:

- Provide the industry with a single, public list of the standards and implementation specifications that can best be used to fulfill specific clinical health information interoperability needs.
- Reflect the results of ongoing dialogue, debate, and consensus among industry stakeholders when more than one standard or implementation specification could be listed as the best available.

- Document known limitations, preconditions, and dependencies as well as known security patterns among referenced standards and implementation specifications when they are used to fulfill a specific clinical health IT interoperability need.

The Standards and Interoperability (S&I) Framework (http://www.siframework.org/) empowers healthcare stakeholders to establish standards, specifications and other implementation guidance that facilitate effective healthcare information exchange. The S&I Framework creates a forum – enabled by integrated functions, processes, and tools – where healthcare stakeholders can focus on solving real-world interoperability challenges.

Minnesota e-Health Standards Resources

The Standards Recommended to Achieve Interoperability in Minnesota (Updated 2011) was developed to provide practical support to those having to meet the Minnesota Interoperable EHR Mandate, as wells as to achieve the Minnesota e-Health Initiative's goals of improving care and supporting healthier communities. See http://www.health.state.mn.us/e-health/standards/standardsdocs/g2standards2011.pdf.

Recommendations Regarding the Use of Standards Nursing Terminology in Minnesota was developed by the Minnesota e-Health Standards & Interoperability Workgroup. These recommendations were approved by the Commissioner of Health and will be incorporated in the next edition of the Standards Recommended to Achieve Interoperability in Minnesota. See http://www.health.state.mn.us/e-health/standards/standardsdocs/nursingterminology082114.pdf.

Challenges and Opportunities for E-health Standards in Minnesota

- National e-health standards exist for many transactions and Minnesota e-Health Initiative aims to make recommendations that promote adoption and use of national standards.
- There is an underutilization of Minnesota's recommended e-health standards in many settings. In some settings, e-health standards are not yet developed.
- Considerable work is needed regarding e-health standards recommendations to encourage their adoption and use statewide, particularly for settings not directly included in the federal meaningful use EHR incentive program.

Appendix G: Glossary of Selected Terms

Accountable Care Organization (ACO)

An Accountable Care Organization is a group of health care providers with collective responsibility for patient care that helps providers coordinate services—delivering high- quality care while holding down costs. **Source:** Robert Wood Johnson Foundation, www.rwjf.org/en/topics/search-topics/A/accountable-care-organizations-acos.html

e-Health

E-health is the adoption and effective use of electronic health record (EHR) systems and other health information technology (HIT) including health information exchange to improve health care quality, increase patient safety, reduce health care costs, and enable individuals and communities to make the best possible health decisions. **Source:** Minnesota Department of Health, http://www.health.state.mn.us/e-health/

Electronic Health Record (EHR) Systems

EHR is a real-time patient health record with access to evidence-based decision support tools that can be used to aid clinicians in decision-making. The EHR can automate and streamline a clinician's workflow, ensuring that all clinical information is communicated. It can also prevent delays in response that result in gaps in care. The EHR can also support the collection of data for uses other than clinical care, such as billing, quality management, outcome reporting, and public health disease surveillance and reporting. EHR is considered more comprehensive than the concept of an Electronic Medical Record (EMR). **Source:** Office of the National Coordinator for HIT Health IT Glossary, http://www.hhs.gov/healthit/glossary.html

e-Prescribing

E-prescribing means secure bidirectional electronic information exchange between prescribers (providers), dispensers (pharmacies), Pharmacy Benefits Managers, or health plans, directly or through an intermediary network. E-prescribing encompasses exchanging prescriptions, checking the prescribed drug against the patient's health plan formulary of eligible drugs, checking for any patient allergy to drug or drug-drug interactions, access to patient medication history, and sending or receiving an acknowledgement that the prescription was filled. **Source**: http://www.health.state.mn.us/e-health/glossary/e.html

Health Equity

Exists when every person has the opportunity to realize their health potential — the highest level of health possible for that person — without limits imposed by structural inequities. Health equity means achieving the conditions in which all people have the opportunity to attain their highest possible level of health. **Source:** Minnesota Department of Health, Minnesota: Report to the Legislature, http://www.health.state.mn.us/divs/chs/healthequity/

Health Information Exchange (HIE)

Health information exchange or HIE means the electronic transmission of health related information between organizations according to nationally recognized standards. **Source**: Minnesota Statutes §62J.498 sub. 1(f), https://www.revisor.mn.gov/statutes/?id=62J.498

Health Information Technology (HIT)

HIT is the application of information processing involving both computer hardware and software that deals with the storage, retrieval, sharing, and use of health care information, data, and knowledge for communication and decision making. **Source*:*** Office of the National Coordinator for HIT Glossary, http://www.healthit.gov/policy-researchers-implementers/glossary

Health Informatics

The use of the principles and the practices of computer science in addressing the problems of health and health care. An interdisciplinary field of scholarship that applies computer, information, management and cognitive sciences to promote the effective and efficient use and analysis of information to improve the health of individuals, the community and society. **Source:** Adapted from the University of Minnesota, Health Informatics program: http://www.hinfgrad.umn.edu/mhi/background.html and http://www.amia.org

Interoperability

The ability of two or more information systems or components to exchange information with limited human intervention and to use the information that has been exchanged accurately, securely, and verifiably, when and where needed. **Source*:*** *adapted from* Office of the National Coordinator for HIT, http://www.hhs.gov/healthit/glossary.html

Learning Health System

A health system in which science, informatics, patient-provider partnerships, public health, incentives, and culture are aligned to promote and enable continuous and real-time improvement in patient care and population health. (Adapted from http://www.iom.edu/Reports/2012/Best-Care-at-Lower-Cost-The-Path-to-Continuously-Learning-Health-Care-in-America.aspx

Meaningful Use

The use of electronic health record technology that includes e-prescribing, and is connected in a manner that provides for the electronic exchange of health information and used for the submission of clinical quality measures as established by the Center for Medicare and Medicaid Services and the Minnesota Department of Human Services pursuant to sections 4101, 4102, and 4201 of the HITECH Act including subsequent regulations, rules and guidance issued pursuant to the HITECH Act. [Minn. Stat. §62J.498 sub. 1(k)]. **Source:** https://revisor.mn.gov/statutes/?id=62J.498

Minnesota e-Health Initiative

The Minnesota e-Health Initiative is a public-private collaborative whose vision is to accelerate the adoption and use of health information technology in order to improve health care quality, increase patient safety, reduce health care costs and improve public health. **Source*:*** MN Department of Health, www.health.state.mn.us/e-health/abouthome.html

Social Determinants of Health

The complex, integrated, and overlapping social structures and economic systems that are responsible for most health inequities. These social structures and economic systems include the social environment, physical environment, health services, and structural and societal factors. Social determinants of health are shaped by the distribution of money, power, and resources throughout local communities, nations, and the world. (Commission on Social Determinants of Health (CSDH), Closing the gap in a generation: health equity through action on the social determinants of health. Final report of the Commission on Social Determinants of Health. 2008, World Health Organization: Geneva.)

Standards

Health data standards are consistent, uniform ways to capture, record and exchange data. Standards are a necessary component to achieve interoperability (see above). The various types of standards include Terminology (how data such as lab results and diagnosis are coded in uniform ways), Messaging (how data are sent in ways that the receiving system can understand what's coming in), Transactions/claims (to receive payment), and Data Content (common definitions and codes, such as for race and ethnicity).

Triple Aim

Improving care, improving population health and reducing costs of health care. **Source*:*** http://www.ihi.org/engage/initiatives/tripleaim/Pages/default.aspx

The full Minnesota e-Health Glossary is available online at http://www.health.state.mn.us/e-health/glossary.html.