Minnesota Nursing Homes e-Health Report, 2016

ADOPTION AND USE OF ELECTRONIC HEALTH RECORD SYSTEMS AND HEALTH INFORMATION EXCHANGE

MDH Minnesota
Department *of* Health

OFFICE OF HEALTH INFORMATION TECHNOLOGY

Minnesota Nursing Homes e-Health Report, 2016

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Contents

Executive Summary

This report presents results from the 2016 Minnesota Health Information Technology (HIT) Nursing Home Survey regarding implementation of e-health. For the purpose of this report, nursing homes are licensed skilled nursing facilities. E-health is adoption and effective use of electronic health record (EHR) systems and other HIT, including health information exchange (HIE), to improve health care quality, increase patient safety, reduce health care costs, and enable individuals and communities to make the best possible health decisions.

Adoption

- Ninety-five percent of responding nursing homes in Minnesota have implemented EHRs, an increase from 69% 2011. Adoption rates are higher in private not-for-profit facilities (97%) and those with 100 or more beds (99%).
- The market is dominated by two vendors: PointClickCare (65%) and MatrixCare (25%).
- Information on medications/allergies, care plans and vital records are fully integrated into the EHR for most facilities.

Use of EHR Systems

- Many electronic documentation functionalities are fully implemented in most EHRs.
- Clinical decision support tools that are most commonly in use include care plans and flow sheets (61%) and medication alerts/reminders (61%).
- About one-fourth of nursing homes have fully implemented electronic results viewing capabilities (e.g., laboratory results viewing and radiology reports).

Exchange of Health Information

- E-prescribing is not commonly used among Minnesota's nursing homes, with just 11% of nursing homes originating the prescription in the EHR by facility staff and electronically submitting.
- Direct message is used by 17% of nursing homes, and another 27% are in the process of establishing the service.
- Most information exchange is not happening electronically. Nursing homes most often receive and/or send resident information by paper or fax.
- Resources and skills development most needed include integrating resident information from external sources into the EHR, training staff and clinicians to use the EHR, and using data for analysis and managing data quality.

In Summary

This assessment shows the tremendous progress Minnesota's nursing homes have made in implementing EHR systems. Further, nursing homes are utilizing many of the electronic care tools available in the EHRs. However, results show that nursing homes still have many opportunities to optimize the EHR technology by using automated ordering, decision support tools, and seamlessly sharing resident health information with other providers. Opportunities for improvement include:

- Integration of advanced directives to support end of life decisions;
- Integration of history and physical information;
- Use of medication reconciliation and CPOE for medication to reduce medication errors.

Implementing electronic health information exchange is a challenge for many providers in Minnesota. MDH and the Minnesota e-Health Initiative are working to address the barriers to the exchange and integration of information into the EHRs. All health providers and organizations in Minnesota are encouraged to engage with these efforts, and also engage community partners. For organizations that participate in accountable health models, connecting to post-acute care is a critical tool to ensure all providers have the information they need to care for patients and residents.

Introduction

E-health is 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. In 2008, the Minnesota e-Health Initiative, a public-private collaborative to accelerate the adoption and use of health information technology, developed the Minnesota Model for Adopting Interoperable EHRs that is applied to all aspects of the Initiative's work and policy development. The model has seven steps which are grouped into three major categories:

- Adopt: assessment of needs and readiness, planning, and selecting an EHR system.
- Utilize: implementing an EHR system and learning how to use it effectively.
- Exchange: determining readiness to exchange information electronically with other partners, and implementing regular, ongoing exchange between interoperable EHR systems.

To help inform progress toward these goals and identify guidance needed by providers to meet this mandate, the Minnesota Department of Health (MDH) established a framework – the Minnesota e-Health Profile – for assessment and evaluation of EHR adoption and use across multiple health settings that is based on the Minnesota Model. The Minnesota e-Health Profile is a series of online surveys of health care and public health settings designed to uniformly collect and share the progress of Minnesota's providers in adopting and implementing EHR systems, and exchanging electronic health information.

The assessment information is used to:

- Measure Minnesota's status on achieving state and national goals to accelerate adoption and use of EHRs and other HIT and to achieve interoperability of health information;
- 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 collaborative efforts.

Data presented in this report are from the Minnesota Nursing Home Health Information Technology Survey (survey) conducted by the MDH Office of Health Information Technology. The survey was previously conducted in 2011 and many questions were continued for 2016. The 2016 survey includes responses from 266 of 377 licensed nursing homes that are members of Care Providers of Minnesota and/or LeadingAge Minnesota, for a response rate of 71%. For the purpose of this report, nursing homes are licensed skilled nursing facilities. Complete methodology information is presented in Appendix A.
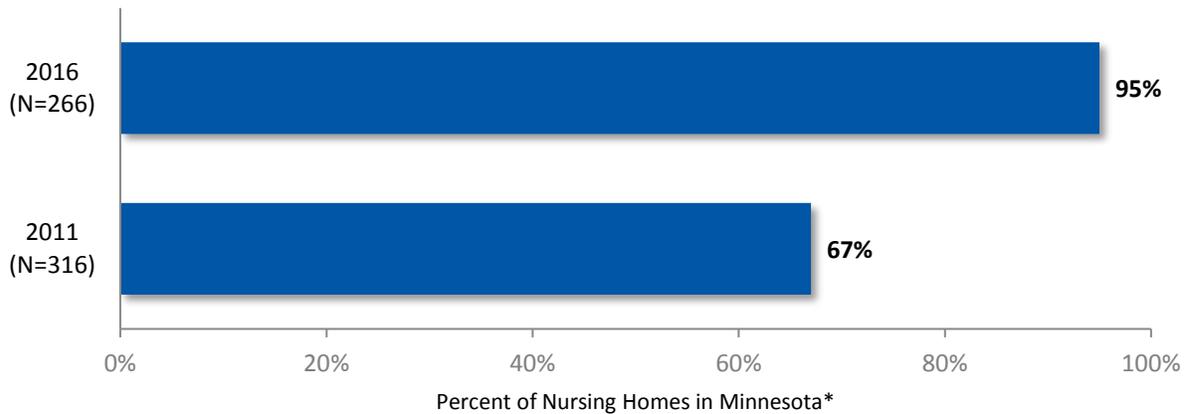
EHR Adoption

This section presents information on EHR adoption status, the systems used, and barriers to implementation among nursing homes that have not yet adopted. Adoption of EHR systems involves a process of assessment, planning, and selection, followed by a series of steps leading to implementation and integration of documentation.

Most Nursing Homes Have Implemented EHR Systems

Ninety-five percent of responding nursing homes in Minnesota have implemented EHRs, representing 254 of 266 responding nursing homes. Exhibit 1 shows EHR adoption rates have increased over time, from 69% 2011 (217 facilities) to 95% in 2016 (254 facilities).

Exhibit 1: EHR Adoption among Minnesota's Nursing Homes, 2011-2016

Percent of Nursing Homes in Minnesota*

* Percentages are based on the number of responding nursing home.

Exhibit 2 presents adoption rates by facility ownership and geography. There is a difference in rates of adoption between ownership, with 97% of private not-for-profit facilities, 90% of private for-profit facilities, and 85% of government-owned facilities implementing EHR systems. There is also a difference by size of facility, with 99% of large facilities (100 or more beds) adopting, compared to 95% of mid-size (50-99 beds) and 90% of small (<50 bed) facilities. There is no difference in adoption rates between urban and rural nursing homes.

Exhibit 2: EHR Adoption by Ownership and Size, 2016

Percent of Nursing Homes with EHRs
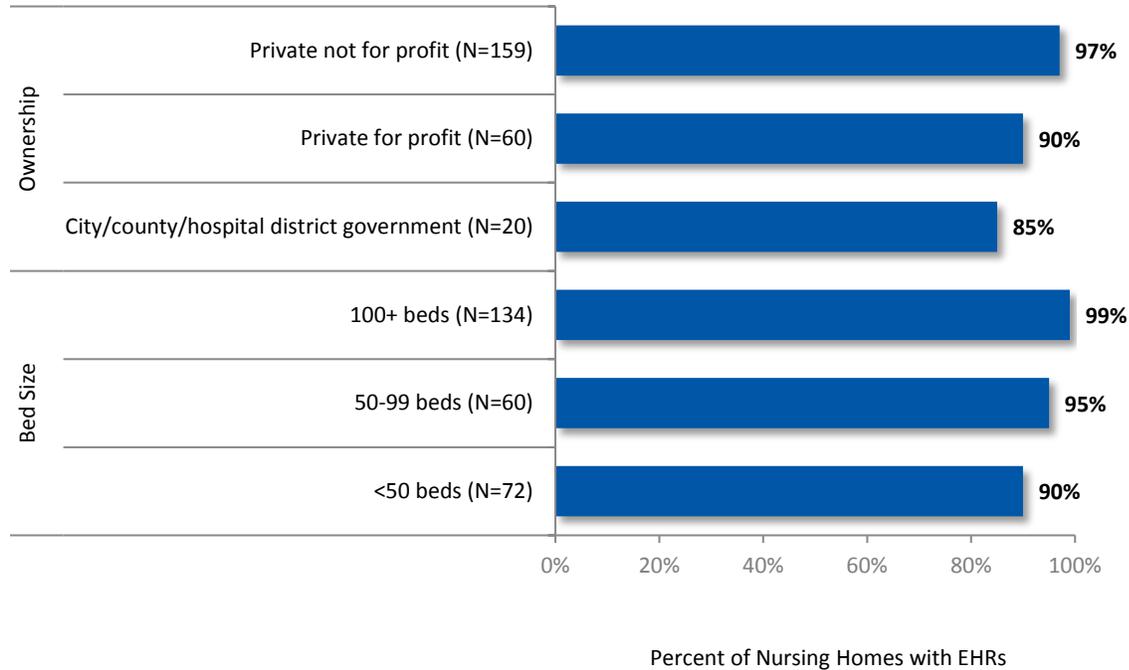
Of the 12 nursing homes that have not yet implemented or begun installing their EHR system, the most commonly indicated barriers include costs of maintaining the system, lost productivity during transition, and adequate training for staff (Exhibit 3).

Exhibit 3: Non-adopter Barriers to EHR Implementation, 2016

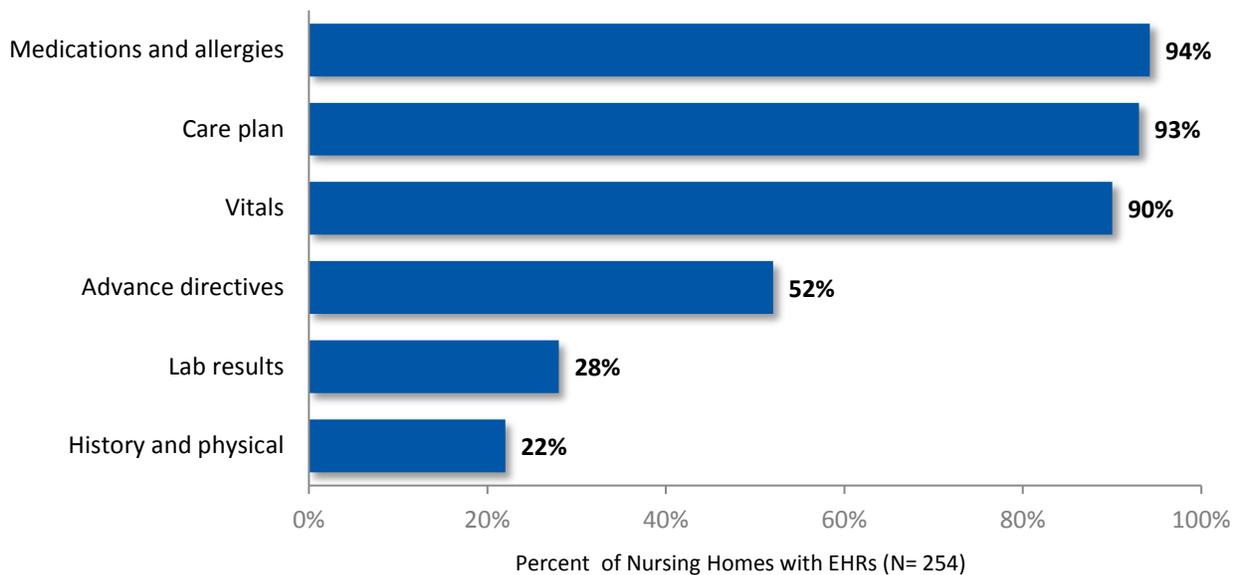|	Count
Loss of productivity during the transition to an EHR system	5
Annual cost of maintaining an EHR system	4
Adequacy of training for you and your staff	4
Access to high speed Internet (e.g., broadband, cable)	3
Resistance of your organization to change work habits	3
Ability to secure financing for an EHR system	2
Finding an EHR system that meets your facility's needs	1
Reaching consensus within the organization to select an EHR	1
Total	12

Few EHR Vendors Share the Market

Minnesota's nursing home EHR market is dominated by PointClickCare and MatrixCare, which combine for 90% of the market (Exhibit 4). Other vendors with a market presence include Optimus (3%), HealthMEDx (2%), American Data (2%), and NTT Data (2%).

Exhibit 4: EHR Systems Used by Adopting Nursing Homes, 2016

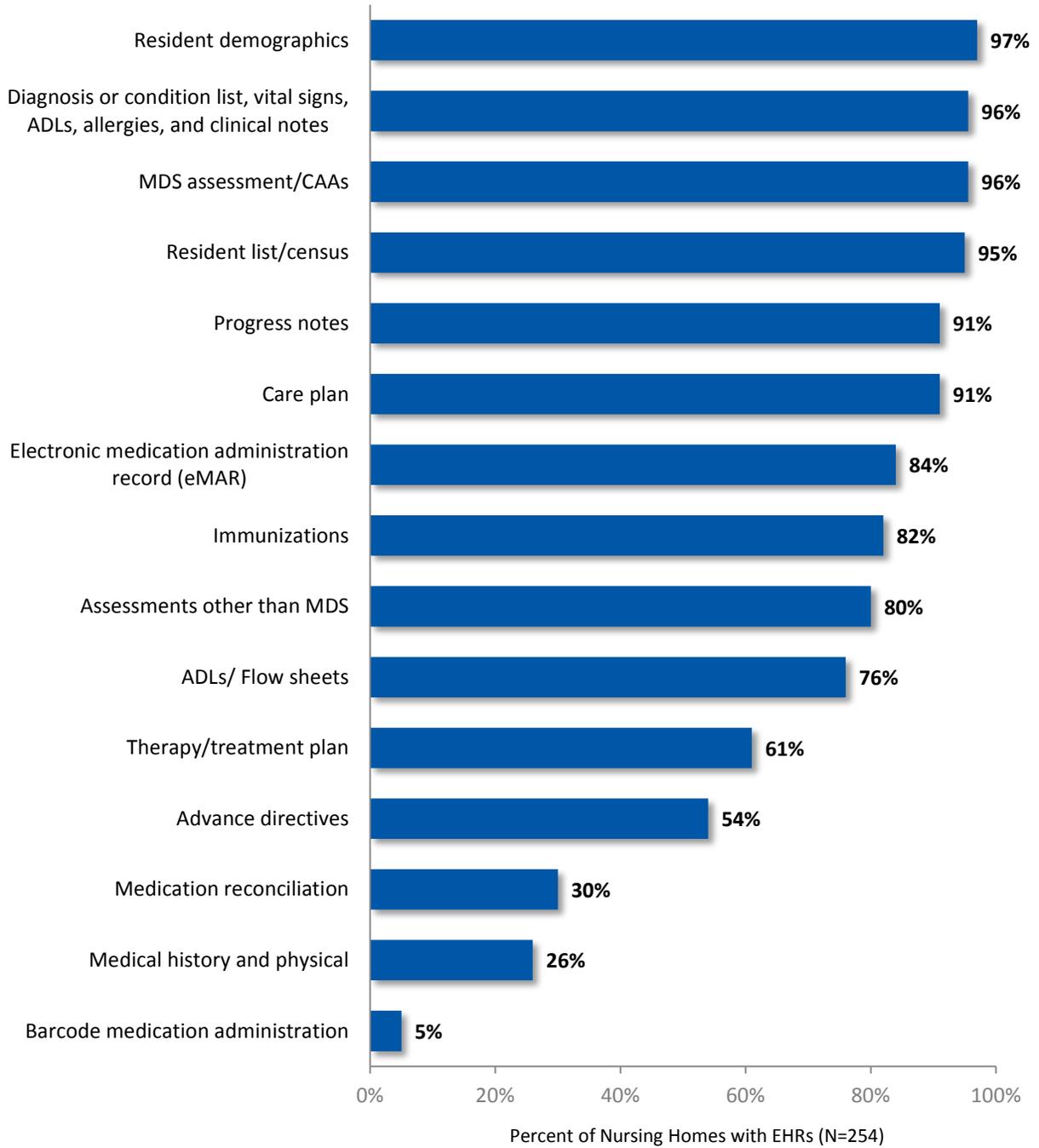| EHR Vendor	Percent	Count
PointClickCare	65%	165
MatrixCare	25%	63
Optimus	3%	8
HealthMEDx	2%	5
American Data	2%	4
NTT Data/Keane Care	2%	4
Other	2%	5
Total		254

Most nursing homes with EHRs have integrated resident information into their EHR for care plans, medications and allergies, and vital signs (Exhibit 5). Integration of this information is necessary for nursing home staff to use the many functionalities of the EHR discussed later in the report. Many fewer nursing homes have integrated lab results, history and physical information, and advance directives. This may indicate that nursing homes struggle to capture comprehensive information from the resident's clinical EHR.

Exhibit 5: Nursing Homes with More than Two-thirds of Resident Records Integrated into the EHR, 2016

Category	Percent
Medications and allergies	94%
Care plan	93%
Vitals	90%
Advance directives	52%
Lab results	28%
History and physical	22%

Percent of Nursing Homes with EHRs (N= 254)

Most nursing homes have installed a broad array of documentation functionalities. Exhibit 6 show the functions installed and in use by all relevant staff.

**Exhibit 6: Electronic Documentation EHR Functionalities
Installed and in Use by All Relevant Staff, 2016**

Functionality	Percent
Resident demographics	97%
Diagnosis or condition list, vital signs, ADLs, allergies, and clinical notes	96%
MDS assessment/CAAs	96%
Resident list/census	95%
Progress notes	91%
Care plan	91%
Electronic medication administration record (eMAR)	84%
Immunizations	82%
Assessments other than MDS	80%
ADLs/ Flow sheets	76%
Therapy/treatment plan	61%
Advance directives	54%
Medication reconciliation	30%
Medical history and physical	26%
Barcode medication administration	5%

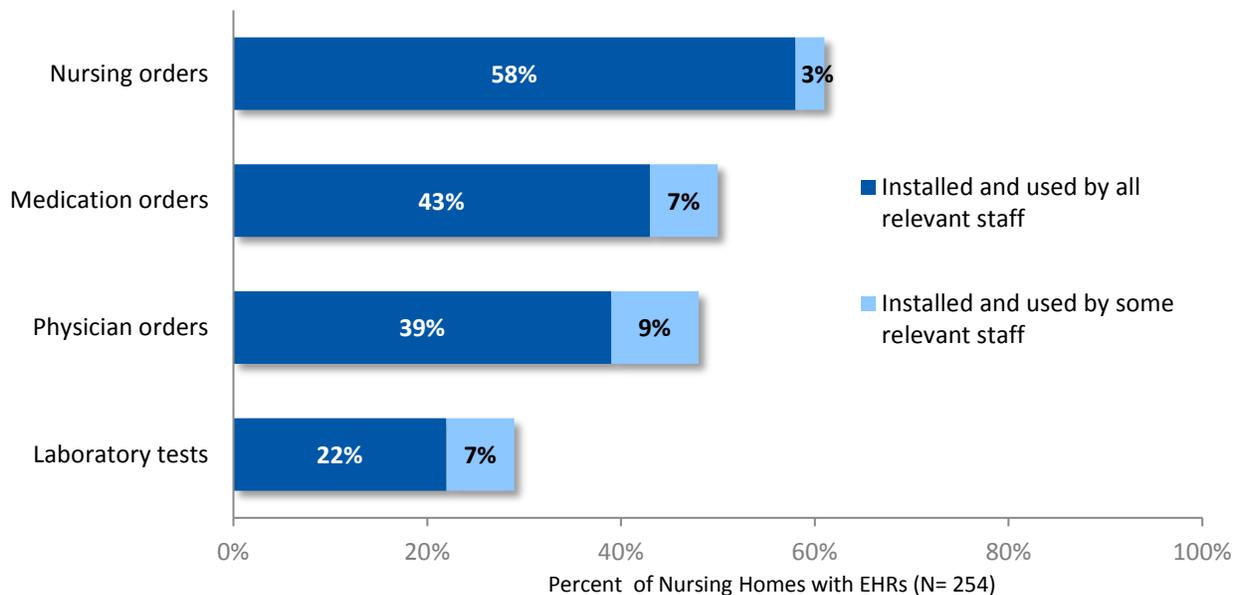Percent of Nursing Homes with EHRs (N=254)

Utilization of EHR Systems

The real value from investing in and implementing an EHR system comes from using it to support efficient workflows and effective clinical decisions. Effective use means 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. This section presents utilization of EHRs for CPOE, CDS, and electronic prescribing. See Appendix B for definitions of these tools.

Use of Computerized Provider Order Entry

Over half of nursing homes (58%) have installed CPOE for nursing orders and have it in use by all relevant staff. Fewer nursing homes have fully implemented computerized medication orders (43%) or physician orders (39%), and just 22% for computerized lab orders (Exhibit 7).

Exhibit 7: Use of Computerized Provider Order Entry (CPOE), 2016

Legend:
- ■ Installed and used by all relevant staff
- ■ Installed and used by some relevant staff

Nursing orders: 58% / 3%
Medication orders: 43% / 7%
Physician orders: 39% / 9%
Laboratory tests: 22% / 7%

Percent of Nursing Homes with EHRs (N= 254)

Use of Clinical Decision Support Tools

The nursing home survey measured several CDS tools and functionalities. Exhibit 8 shows nursing homes with EHRs have all relevant staff using care plans and flow sheets (61%) and medication alerts/reminders (61%). Less commonly-used tools in use include alerts/reminders for condition-specific activities (36%), alerts/reminders for preventive care services due (27%), and alerts for missing labs and tests (29%). Tools for clinical guidelines and exams are not commonly used.

Exhibit 8: Electronic Clinical Decision Support Capabilities, 2016

Percent of Nursing Homes with EHRs (N= 254)
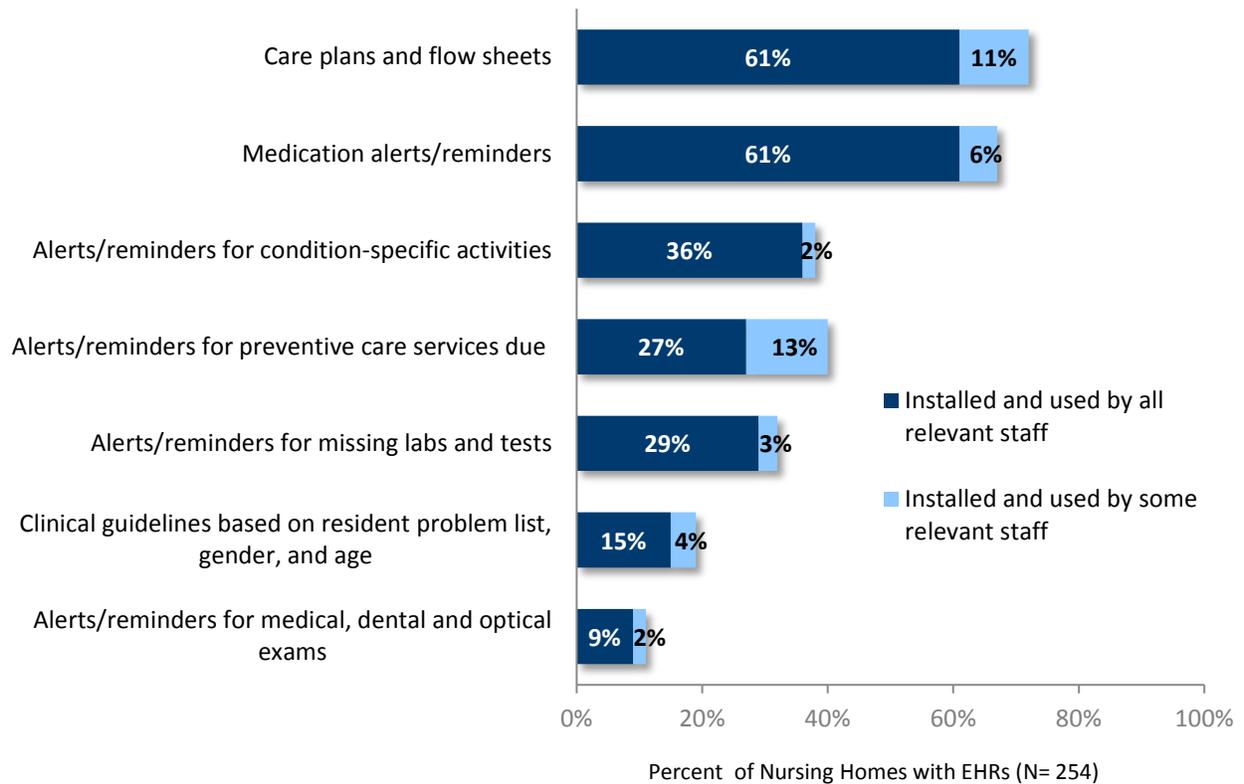
Results Viewing

About one-fourth of nursing homes have fully implemented electronic results viewing capabilities. Twenty-six percent have installed laboratory results viewing and have this capability in use by all relevant staff, while 23% can view radiology reports and 24% can view other test results.

Exhibit 9: Electronic Results Viewing Capabilities, 2016

Percent of Nursing Homes with EHRs (N= 254)
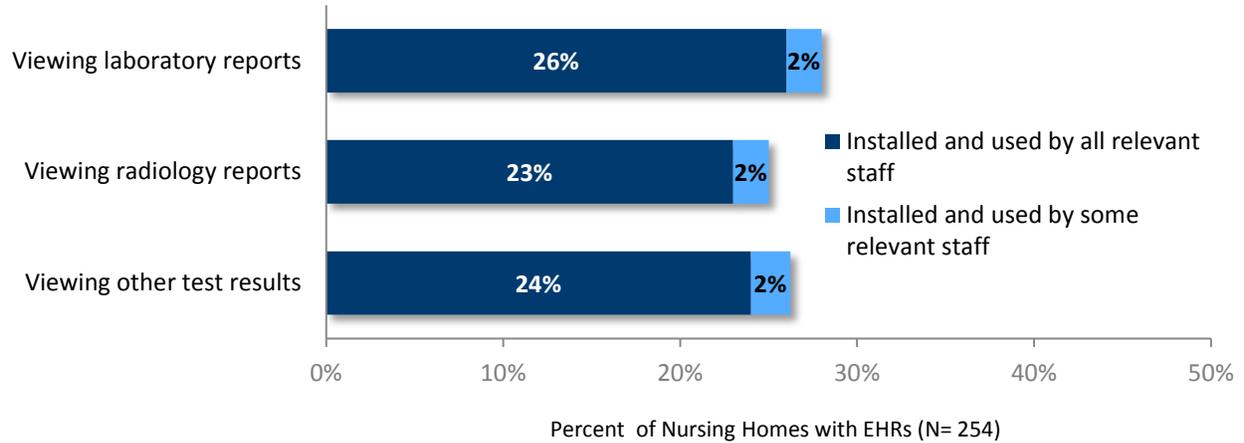
Public Health Reporting

Few nursing homes are able to electronically submit public health reports. Just 9% electronically submit data to immunization registries, and 6% can electronically submit data on reportable diseases (Exhibit 10).

Exhibit 10: Electronic Public Health Reporting Capabilities, 2016

Percent of Nursing Homes with EHRs (N= 254)
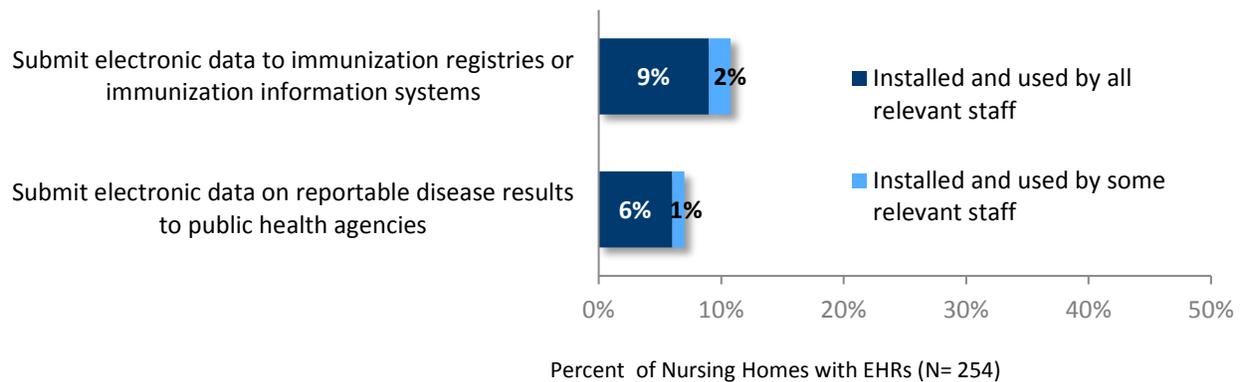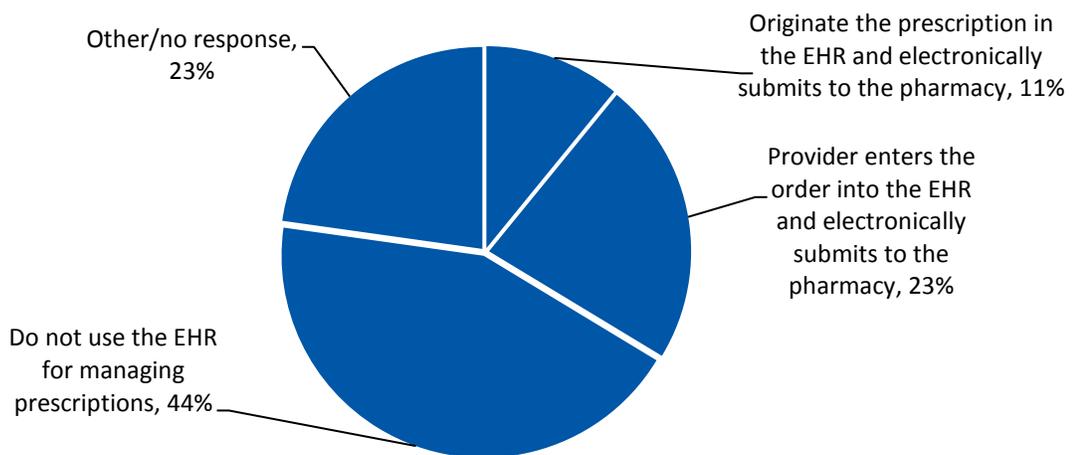
Health Information Exchange

Health information exchange (HIE) is the secure electronic exchange of clinical information between organizations using nationally recognized standards. HIE makes health information available, when and where it is needed, to improve the quality and safety of health and health care. 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 hospitals and clinics in the same system or with affiliated partners.

Electronic Prescribing

Electronic prescribing, or "e-prescribing," means secure bi-directional electronic information exchange between prescribing prescribers, pharmacists and pharmacies, and payers or pharmacy benefit managers. E-prescribing improves the quality of resident care by enabling a prescriber 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, and efficiency of the entire prescribing and medication management process.

Exhibit 11 shows e-prescribing is not commonly used among Minnesota's nursing homes, with just 11% of nursing homes originating the prescription in the EHR by facility staff and electronically submitting. For another 23% of nursing homes, the facility staff communicates the prescription to the provider by phone or fax, and then the provider enters the order into the EHR and electronically submits to the pharmacy. Nearly half of nursing homes do not use the EHR for managing prescriptions.

Exhibit 11: Nursing Home Prescribing Workflow, 2016*

Other/no response, 23%

Originate the prescription in the EHR and electronically submits to the pharmacy, 11%

Provider enters the order into the EHR and electronically submits to the pharmacy, 23%

Do not use the EHR for managing prescriptions, 44%

* Prescribing for non-controlled substance prescriptions.

Direct Secure Messaging

Direct secure messaging (Direct) is a standards-based method of information exchange that enables providers to securely send personal health information to other trusted parties. It is effectively a secure email that can transmit information as an attachment or within the message itself. It is a useful tool for providers and organizations, even if they don't have an EHR, because it protects the information.

Exhibit 12 shows 17% of Minnesota's nursing homes use Direct, and another 27% are in the process of establishing the service. Nearly one-third (31%) are not in the process of establishing service, and 25% do not know.

Exhibit 12: Use of Direct Secure Messaging, 2016

Use Direct, 17%

Do not know, 25%

Do not use Direct but are in process of establishing the service, 27%

Do not use Direct and are not in the process of establishing the service, 31%
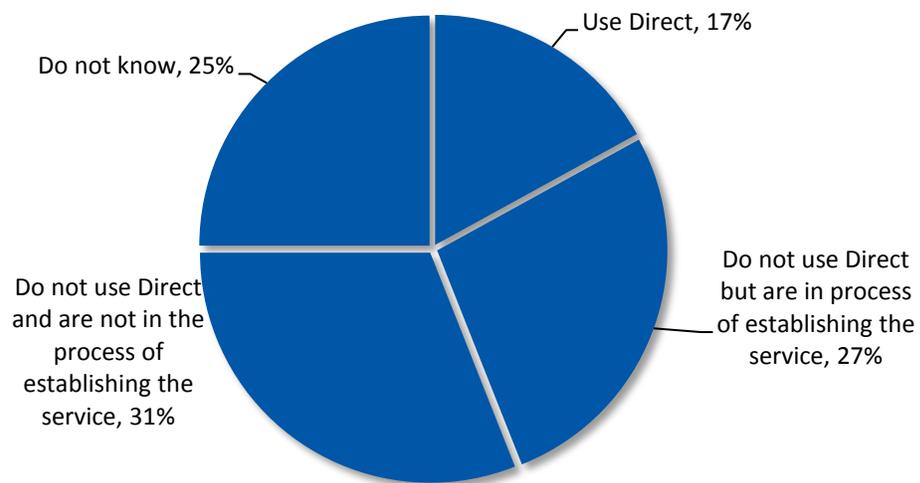
Looking at use of Direct by EHR vendor, Exhibit 13 shows this service is less commonly used by facilities that use PointClickCare (15%) or MatrixCare (13%), compared to other vendors (42%). However, 36% percent of PointClickCare users are in the process of establishing service.

Exhibit 13: Use of Direct Secure Messaging by EHR Vendor, 2016

	PointClickCare	MatrixCare	Other
Use Direct	15%	13%	42%
Do not use Direct but are in process of establishing the service	36%	16%	0%
Do not use Direct and are not in the process of establishing the service	21%	59%	27%
Don't know or no response	29%	13%	31%
Number of facilities	165	63	26

Use of Automated Notifications from Hospitals

Automated electronic notifications can be used by hospitals to notify another provider when their resident has been admitted, discharged, and/or transferred to another facility. These notifications are commonly referred to as "ADT" alerts, and are designed to improve the timely flow of information in situations where care coordination is a critical need.[1] Exhibit 14 shows 22% of nursing homes receive automated alerts, and 12% send alerts.

**Exhibit 14: Nursing Homes' Use of Automated Alerts, 2016**
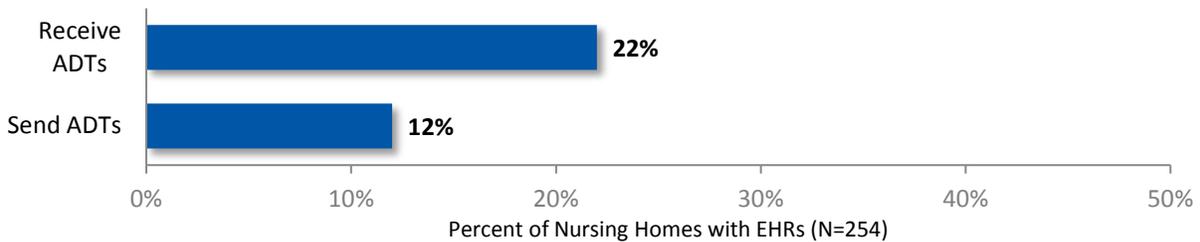
[1] Office of the National Coordinator for Health IT. 2013. Improving Hospital Transitions and Care Coordination Using Automated Admission, Discharge and Transfer Alerts; A Learning Guide. Available at https://www.healthit.gov/sites/default/files/onc-beacon-lg1-adt-alerts-for-toc-and-care-coord.pdf

Electronic Sending and Receiving

Electronic health information exchange is not common among Minnesota's nursing homes. Exhibit 15 shows just 4% of nursing homes with EHRs usually received resident health information electronically directly from the sender to their EHR, without need for manual entry. Eleven percent of nursing homes always or often receive resident information via Direct secure messaging but then manually enter the data into the EHR. Most nursing homes receive information by paper or fax.

Exhibit 15: How Resident Health Information is Received, 2016

Percent of Nursing Homes with EHRs (N= 254)
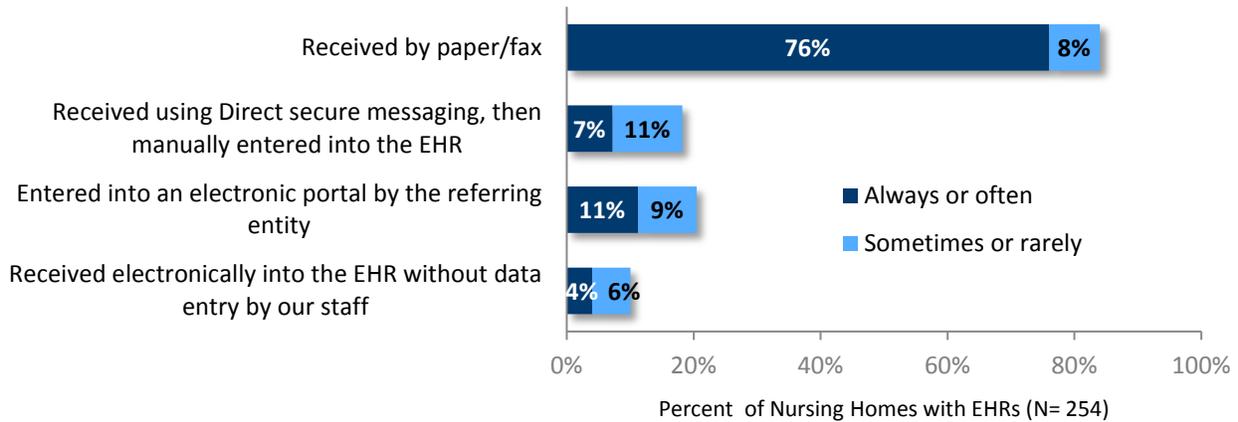
Similarly, few nursing homes electronically send resident health information. Just 2% of nursing homes always or often send electronically from the EHR (Exhibit 16), and 2% always or often extract information from the EHR and send using Direct secure messaging. Nearly two-thirds of nursing homes (63%) always or often extract information from the EHR and send by paper or fax to the receiving facility, and 26% always or often do not use the EHR to extract or send the information.

Exhibit 16: How Resident Health Information is Sent, 2016

Percent of Nursing Homes with EHRs (N= 254)
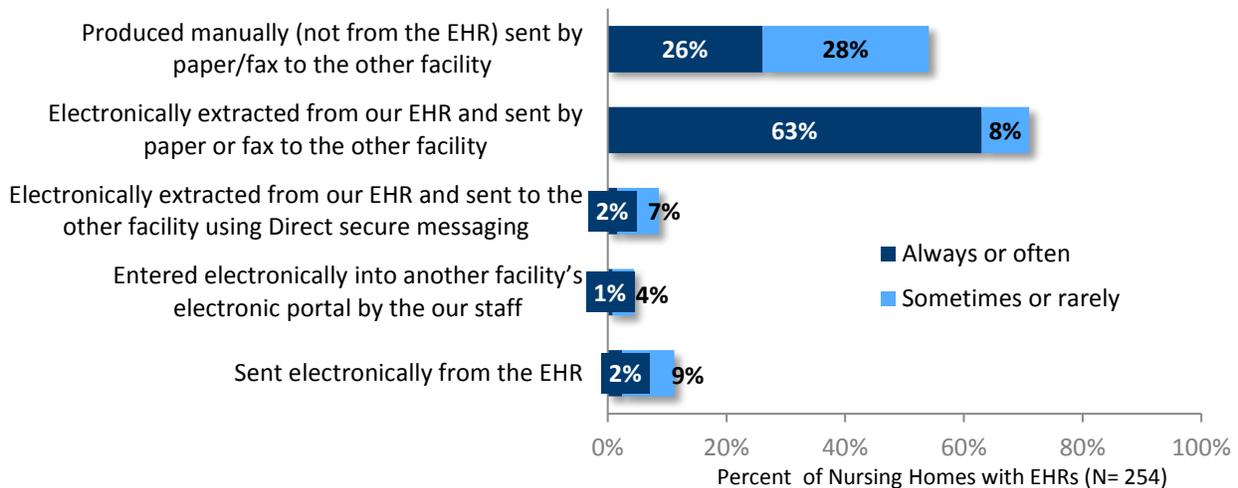
Privacy & Security

An important component of HIE is that residents and their families/caregivers must have confidence in the integrity of the data being shared, and trust that providers using the data have procedures in place to keep their information safe and secure. Health care providers must implement standards for securing electronic health information to ensure appropriate safeguards are in place to protect that data from unauthorized access.

Exhibit 17 shows most nursing homes with EHRs (91%) limited the EHR user's access to information based on staff function or other criteria, and 85% conducted or reviewed security risk analysis information and updates as necessary as part the their risk management processes.

**Exhibit 17: Privacy and Security Practices, 2016**
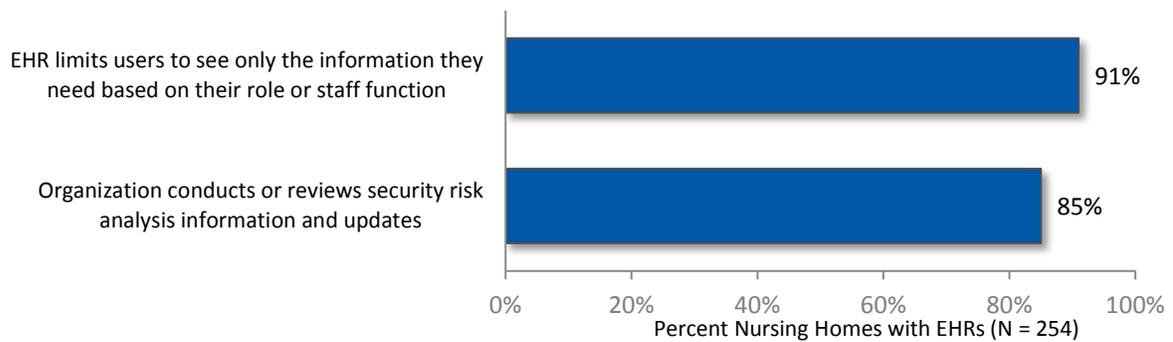
Consumer Access to Health Information

With the implementation of EHRs, health care providers have the opportunity to provide residents and their families/caregivers with their health information in an electronic format. These tools can help engage residents and their families/caregivers in health care decisions and aid in keeping the health records updated with current information. The clinic survey assessed two aspects of consumer engagement: ability of residents to electronically view, download and/or transmit their personal health information, and use of patient portals.

Nursing Homes Offering Patient Portals

Patient/resident portals are an internet application maintained by the nursing home that allow residents and families/caregivers to access their electronic health records and permit two-way communication between residents and families/caregivers and their health care providers. Just 2% of nursing homes reported that they offer portal access and 5% offer a personal health record (Exhibit 18). Nearly three-fourths of nursing homes (72%) do not provide electronic access to health information.

Exhibit 18: Online Services Offered Through Patient Portal, 2016
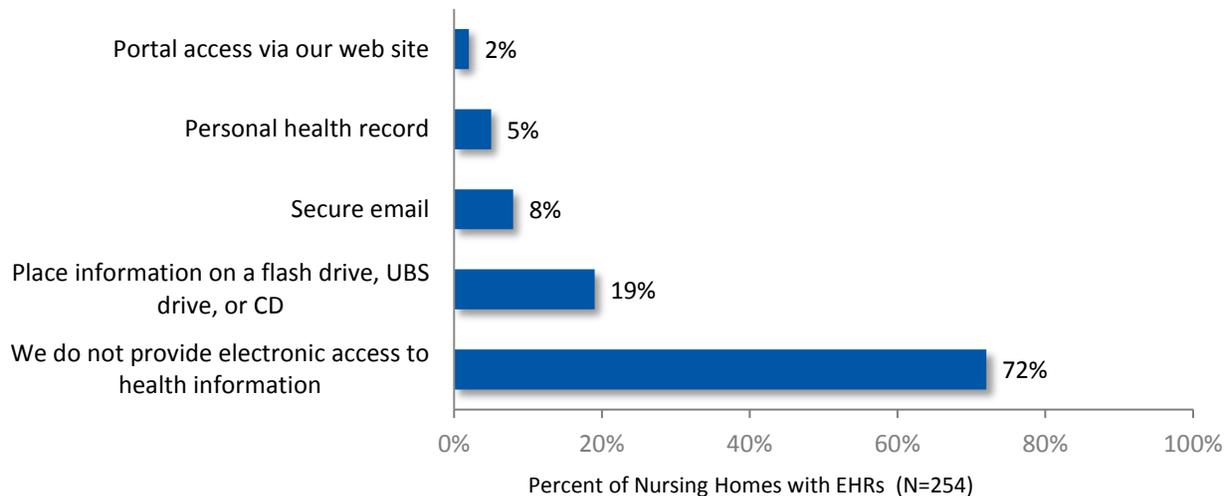
Use of Telemedicine Services

Telemedicine (also called telehealth) is the use of telecommunications technologies to provide health care services to a resident who is physically not with the provider. Telemedicine can include diagnosis, treatment, education and other health care activities.

Exhibit 19 shows about one in four nursing homes use telemedicine for any type of care. The most common types include evaluation and/or diagnosis (18%), clinical consultations (17%), behavioral health (14%), and emergent or urgent off-hour calls (13%).

Exhibit 19: Nursing Homes' Use of Telemedicine Services, 2016
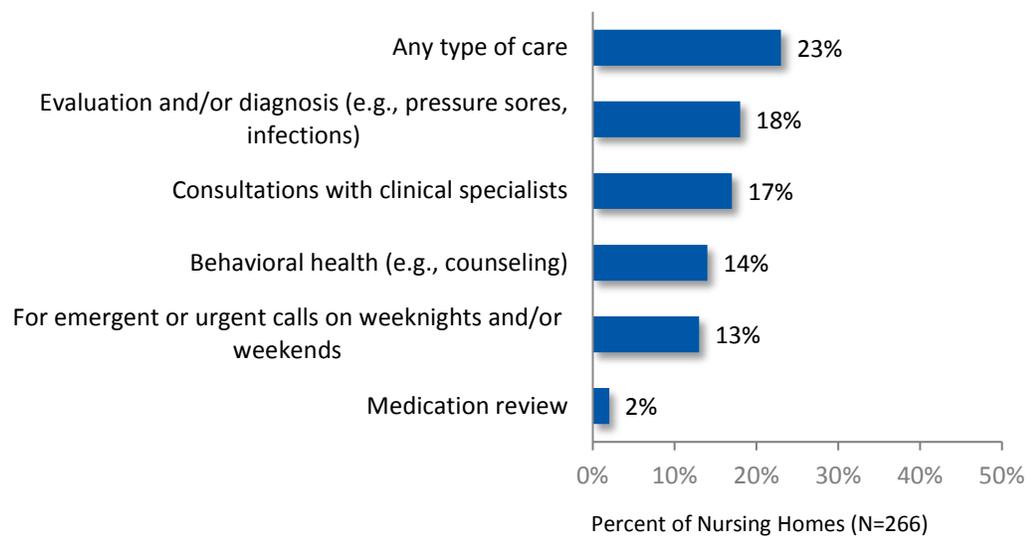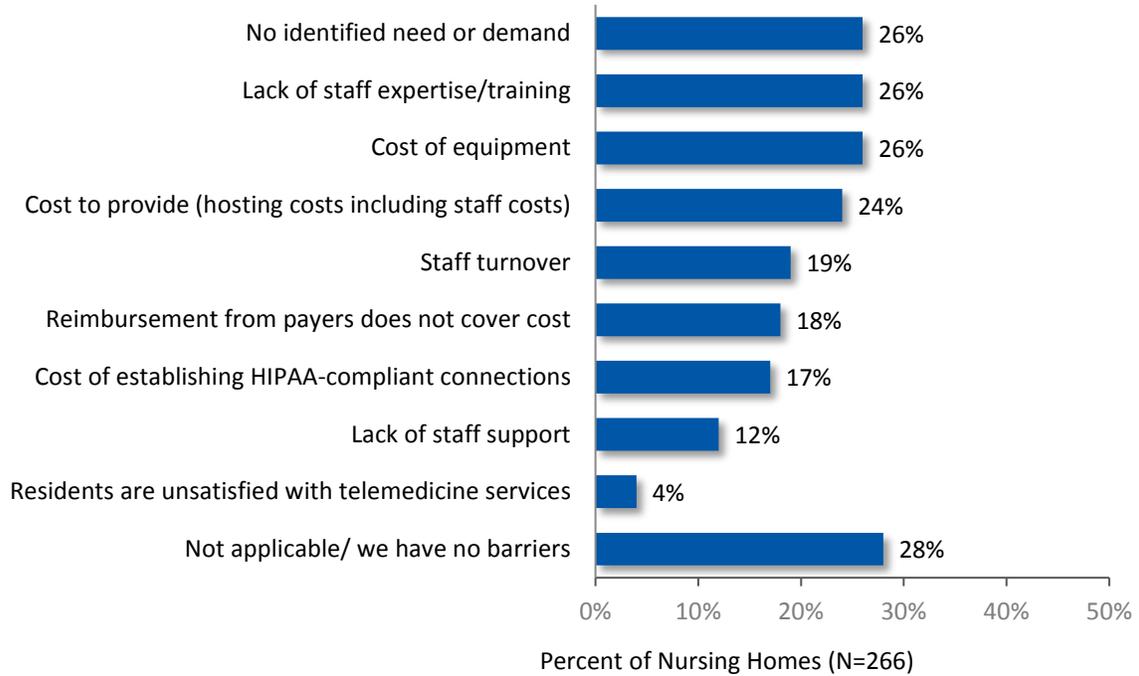

Percent of Nursing Homes (N=266)

Exhibit 20 shows the barriers to using telemedicine. The most commonly-indicated barrier was no identified need or demand for telemedicine services (26%). Financial barriers include cost of equipment (26%), cost to provide services (24%), reimbursement from payers does not cover cost (18%), and cost of establishing HIPAA-compliant connections (17%). Staffing barriers include lack of staff expertise/training (26%), staff turnover (19%), and lack of staff support (12%).

Exhibit 20: Telemedicine Barriers, 2016

Barrier	Percent
No identified need or demand	26%
Lack of staff expertise/training	26%
Cost of equipment	26%
Cost to provide (hosting costs including staff costs)	24%
Staff turnover	19%
Reimbursement from payers does not cover cost	18%
Cost of establishing HIPAA-compliant connections	17%
Lack of staff support	12%
Residents are unsatisfied with telemedicine services	4%
Not applicable/ we have no barriers	28%

Percent of Nursing Homes (N=266)

Resources and Skills Needed to Advance e-Health

Despite many e-health advances by Minnesota's nursing homes, they still need to further optimize the collection, use and sharing of health information. Exhibit 21 shows the percent of nursing homes indicating what resources they need to support EHR implementation, health information exchange, develop analytic skills, and manage resident privacy and security.

Exhibit 21. Resources Needed to Advance e-Health, 2016

Barrier	Percent
Health information exchange and interoperability:	
Integrating resident data from external sources into our EHR	57%
Technical assistance to support HIE with MDH	48%
Developing infrastructure to support HIE	36%
Establishing HIE agreements with exchange partners	23%
Selecting an HIE vendor and/or negotiating an agreement	15%
Implementing EHR systems:	
Training staff and clinicians to use the EHR system	50%
Managing workflow changes	44%
Translating clinical needs to IT staff to optimize and/or customize EHR	27%
Implementing an EHR system, managing EHR system updates, and/or transitioning to a new EHR system	8%
Using data:	
Developing policies and procedures for managing data quality	46%
Using data analytics and/or informatics	50%
Privacy and security:	
Managing resident consent to share health information	31%
Mitigating security risks to help prevent data breaches	24%

Some comments about needed resources include:

- *"All the above require substantial financial resources for staff and implementation."*
- *"Getting all EHR systems to "talk" to each other."*
- *"Getting EPIC to at least push/pull specific CCD data."*
- *"Interoperability capabilities is a large focus for us, and one that seems to be untapped throughout the industry. There seems to be a lack of communication between different industries of care (acute vs sub-acute). We are focusing on solutions in our Wisconsin market. Would be good to see efforts in MN as well."*
- *"Monetary resources for supporting and implementing advanced functionality."*

Conclusion

E-health provides a foundation for health care transformation in Minnesota. E-health supports advanced and efficient care, and the information in these systems supports care coordination and individual decision-making. Minnesota's health community began work to collaboratively move into the electronic era in 2004. Since then many health provides have great strides toward implementation and effective use of EHRs, particularly among clinics and hospitals that received federal incentives. Policymakers in Minnesota recognized that more effective use of health information technology was needed to improve the quality and safety of care and to help control costs, and enacted legislation that requires all health care providers in the state to implement an interoperable EHR system by January 1, 2015 (Minn. Stat. §62J.495). The Minnesota Department of Health (MDH) provides guidance that describes Minnesota's law, the types of providers impacted, what kind of information should be exchanged, privacy and security requirements, and how organizations can go about exchanging information.[2]

Despite an exemption for nursing homes from Minnesota's EHR mandate, the community determined that it is in their best interests to implement e-health along with other settings. This assessment shows the tremendous progress that Minnesota's nursing homes have made in implementing EHR systems. Further, nursing homes are utilizing many of the electronic care tools available in the EHRs. However, results show that nursing homes still have many opportunities to optimize the EHR technology by using automated ordering, decision support tools, and seamlessly sharing resident health information with other providers.

Implementing electronic health information exchange is a challenge for many providers in Minnesota. MDH and the e-Health Initiative are working to address the barriers to exchange and integration of data into the EHRs. All health providers and organizations in Minnesota are

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[2] This guide can be found at: http://www.health.state.mn.us/e-health/hitimp/2015mandateguidance.pdf

encouraged to engage with these efforts, and also engage community partners. For organizations that participate in accountable health models, connecting to post-acute care is a critical tool to ensure all providers have the information they need to care for patients and residents.

As part of Minnesota's efforts to test the accountable health model, MDH developed and released a roadmap to advance e-health, including a focus on long-term and post-acute care settings. The roadmap includes recommendations, resources, and specific actions for organizations and their partners to implement e-health in support of healthier communities. The roadmap is available at http://www.health.state.mn.us/e-health/roadmap.html. Nursing home staff are encouraged to review and u this roadmap in their communities.

Appendix A: Methods

The data in this report contains information on the adoption and use of EHRs and other HIT and exchange of health information in Minnesota's nursing homes as of November 2016. Nursing homes, for the purpose of this study, means any skilled nursing facility licensed to operate in the State of Minnesota. The primary source of the data is the 2016 Minnesota Health Information Technology (HIT) Nursing Home Survey, conducted by the Minnesota Department of Health. The 32-question survey instrument was developed in collaboration with Care Providers of Minnesota and LeadingAge Minnesota, and utilized an advisory group of subject matter experts to advise on the survey instrument and participate as pilot respondents. The advisory group members include:

- Todd Bergstrom, Care Providers of Minnesota
- Mary Chapa, Ebenezer Society
- John Derr, JD & Associates Enterprises, Inc.
- Jonathan Lips, LeadingAge Minnesota
- Amanda Johnson, Tealwood Senior Living
- Peter Schuna, Pathway Health
- Jen Sundby, The Evangelical Lutheran Good Samaritan Society
- Harriet Wicklund, LB Homes
- Catherine Zarske, Sholom

The survey was administered as an online survey from October 3 through November 30, 2016, with options to complete a Word/paper version. Invitations to participate were sent by e-mail to members of Care Providers of Minnesota and/or LeadingAge Minnesota; reminders to non- were sent on October 25 and November 8. The response rate was 71% with 266 of 377 Minnesota nursing homes responding. For the purpose of this report, nursing homes are licensed skilled nursing facilities.

Comparative data provided in this report is from the 2011 Minnesota HIT Nursing Home Survey, also conducted by the Department of Health in collaboration with Care Providers of Minnesota and LeadingAge Minnesota.

Urban and rural designation is based on the Rural-Urban Commuting Area (RUCA) classifications, 2010 version. RUCA is a Census tract-based classification scheme that utilized the standard Bureau of Census Urbanized Area and Urban Cluster definitions with work commuting information to characterize each census tract.

More information on e-health assessment and activities in Minnesota can be found at: http://www.health.state.mn.us/e-health/assessment.html.

Questions about this report and the data can be directed to Karen Soderberg, Research Scientist, karen.soderberg@state.mn.us or 651-201-3576.

Appendix B: Glossary

See http://www.health.state.mn.us/e-health/glossary.html for a comprehensive list of e-health terms.

Clinical Decision Support (CDS) tools: CDS tools provide clinicians or patients with clinical knowledge and patient-related information, intelligently filtered or presented at appropriate times, to enhance patient care.

Computerized Provider Order Entry (CPOE): A computer application that allows a physician's orders for diagnostic and treatment services (such as medications, laboratory, and other tests) to be entered electronically instead of being recorded on order sheets or prescription pads. The computer compares the order against standards for dosing, checks for allergies or interactions with other medications, and warns the physician about potential problems.

Electronic Health Record (EHR) system: An 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 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.

Direct secure messaging: Direct secure messaging is an approach to protect sensitive data using industry standards. It includes security features that go beyond typical email to (1) protect the confidentiality and integrity of sensitive data transmitted between systems or organizations and (2) provides proof of the origin of the data. Secure messages are encrypted bi-directionally and are stored on network or internet servers that are protected by login. Secure messaging functionality may be integrated with the EHR or maintained in a system separate and distinct from the EHR.

E-Prescribing (eRx): 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.

Health information exchange (HIE): The electronic transmission of health related information between organizations according to nationally recognized standards. Health information exchange does not include paper, mail, phone, fax, or standard/regular email exchange of information.

Patient portal: An internet application that allows patients to access their electronic health records and permits two-way communication between patients and their healthcare providers.

Telemedicine: The use of telecommunications technologies (e.g., phones, e-mail, videos) to provide health care services to a patient who is physically not with the provider. Telehealth can include diagnosis, treatment, education and other health care activities.