

eHealth Council

May 13, 2014

9:30-11:15

Nebraska Educational Telecommunications, Board Room, 1800 North 33rd Street, Lincoln

UNMC Location: Business Service Center (4230 Building) Rm# 3037B

There is parking on the north side of the building (backside of the building). The north entrance is the only way to enter the building. Once in the parking lot, look for the green, metal awning over the main entrance. Enter the bldg, take the steps (there's an elevator too) to the 3rd level turn left, walk down the hall to Rm# 3037, (first door on the left). If someone needs assistance, they are welcome to call Brenda Jeter at 402-559-3868)

North Platte: Great Plains Regional Medical Center

Tentative Agenda

9:30	<p>Roll Call Notice of Posting of Agenda Notice of Nebraska Open Meetings Act Posting <i>Approval of Oct. 31, 2013 minutes*</i></p> <p>Public Comment</p>
9:40	Membership
9:45	<p>State HIE Progress Report—Anne Byers State HIE Evaluation Report—Gary Cochran</p>
10:10	<p>Nebraska Broadband Household Survey—Anne Byers</p> <p>E-Prescribing Controlled Substances Update—Walgreens, HyVee, Shopko, Kohll's and a number of independent pharmacies are now enabled for e-prescribing controlled substances.</p>
10:15	<i>NeHII Vision for the Future—Deb Bass</i>
10:45	Discussion of Next Steps

11:05	<p>JASON Report: A Robust Health Data Infrastructure Available at http://healthit.gov/sites/default/files/ptp13-700hhs_white.pdf (Not included in meeting materials)</p> <p>Post from Dr. Karen DeSalvo on the JASON Report: http://www.healthit.gov/buzz-blog/from-the-onc-desk/robust-health-data-infrastructure/ (Not included in meeting materials)</p>
11:15	Adjourn

Meeting notices were posted on the Public Meeting and NITC websites on May 1, 2014.* Indicates action items.

EHEALTH COUNCIL
of the
Nebraska Information Technology Commission
October 31, 2013, 1:30-3:30 p.m.
Wells Fargo Building-5th floor, 13th and O
Lincoln, Nebraska
MINUTES

MEMBERS PRESENT:

Marsh Morien, Co-Chair
Dr. Delane Wycoff, Co-Chair
Wende Baker
Kevin Borchert
Jason Davis, Alt. for September Stone
Joel Dougherty
Marty Fattig
Alice Henneman
Ken Lawonn
Sharon Medcalf
Greg Schieke
Nancy Shank
Max Thacker, Alt. for Carol Brandl

ABSENT: Vivianne Chaumont, Susan Courtney, Senator Annette Dubas, Congressman Fortenberry, Kim Galt, Harold Krueger, Jenifer Roberts-Johnson, Kay Oestmann, John Roberts, and Patrick Werner

ROLL CALL, NOTICE OF POSTING OF AGENDA, NOTICE OF NEBRASKA OPEN MEETINGS ACT POSTING

The meeting was called to order at 1:38 p.m. Roll call was taken. There were 11 members present. A quorum existed to conduct official business. The meeting notice was posted to the NITC and Public Meeting websites on Oct. 11, 2013. The agenda was posted on Oct. 28, 2013.

APPROVAL OF MAY 1, 2013 MINUTES*

Mr. Lawonn moved to approve the [May 1, 2013 minutes](#) as presented. Ms. Medcalf seconded. All were in favor. Motion carried by unanimous voice vote.

PUBLIC COMMENT

There was no public comment.

Mr. Dougherty and Ms. Henneman arrived to the meeting.

PROVIDER SATISFACTION SURVEY

Lina Lander, University of Nebraska Medical Center

Copies of the provider satisfaction report conducted by the UNMC evaluation team (Lina Lander, Daniel Lomelin, Marsha Morien, Gary Cochran, Harlan Hayes, and Don Klepser) were distributed to council members. Dr. Lina Lander reported on the survey results. Over 5,000 healthcare providers in Nebraska were surveyed about their satisfaction with health information exchange. Survey respondents identified cost and lost productivity during implementation as perceived barriers to health information exchange. Respondents identified accessing a comprehensive list of the patient's medications, accessing a comprehensive list of the patient's allergies, and viewing lab results from other providers as the most important functionalities for inclusion in a health information exchange. Over three times as many NeHII users reported being satisfied, compared to being dissatisfied. The information from the survey will help NeHII prioritize future functionality.

PUBLIC HEALTH USE CASES FOR HIE

Dr. Anne O’Keefe, Douglas County Health Department; Kathy Cook, Lincoln-Lancaster County Health Department

Health departments are responsible for reporting diseases for monitoring and intervention purposes. Generally, reports from providers and labs are received electronically. Cases then need to be confirmed which involves a good deal of investigation. NeHII has helped tremendously with Douglas County Health Department’s investigative efforts. Ms. Cook reported that in Lincoln-Lancaster County, NeHII is being used by only a handful of providers, but NeHII is useful for tracking information on Lancaster County patients who have been treated in the Omaha area. It would be good to have more physicians participating in NeHII. Both Dr. O’Keefe and Ms. Cook are working on additional public health use cases utilizing NeHII.

Michelle Hood, Department of Health and Human Services (DHHS)

Ms. Hood works with data exchange and electronic lab reporting. The Department of Health and Human Services is working with physicians and other health care providers to submit their immunization data electronically. Many labs are already submitting reports of reportable diseases electronically. The Department of Health and Human Services also receives syndromic surveillance data from several hospitals and has started receiving data from a few ambulatory providers. Some states are using BioSense for their syndromic surveillance reporting. This is an open-source, cloud-based system sponsored by the CDC. Biosense is a good solution for states without an existing syndromic surveillance system. The Nebraska Department of Health and Human Services is using the Essence System developed by John Hopkins University. The Nebraska Department of Health and Human Services and NeHII are in discussions about submitting syndromic surveillance data through NeHII.

DISCUSSION/UPDATES ON EHEALTH TOPICS

Direct—Deb Bass, NeHII and Wende Baker, eBHIN. Deb Bass gave a presentation on NeHII’s planned Direct implementation. Optum will be serving as the HISP. Optum is still awaiting certification from Direct Trust.

Ms. Baker stated that behavioral health information programs are subject to 42 CFR Part 2 privacy requirements. With patient consent, behavioral health information can be exchanged between providers using Direct secure messaging. There are three challenging case scenarios. First, behavioral health medical home providers are an option, but most clients are of lower income levels and cannot afford to enroll in a medical home environment. These clients most likely will use the acute behavioral health care system. Ms. Baker is working on getting a behavioral health service referral from for clients who may be eligible for a medical home. When the health center identifies and diagnoses a patient, the FQHC may qualify them for a medical home setting. Secondly, Ms. Baker is working with VA on a pilot program for homeless veterans with behavioral health issues. When a veteran enters into a behavioral program, they would be connected with the VA to provide medical home treatment. The third case scenario involves those in the correctional system. When there is continuity of care from discharge from the correctional system to a medical health and medical home, individuals are less likely to return to the correctional system. The project will be doing these use cases next year to see how they will work.

Patient Engagement—Deb Bass, NeHII. Ms. Bass provided a presentation on NeHII’s consumer engagement efforts. Consumers can opt-in or opt-out and can change their status as often as they wish. NeHII has developed several promotional tools:

- Connect the Docs campaign
- Ax the Fax Campaign
- YouTube video (<http://connectnebraska.net/>)
- NeHII Website (www.nehii.org)
- NeHII consumer microsite

Alice Henneman suggested embedding the video on the website. After viewing a video on Youtube.com, viewers see a mosaic of related videos. NeHII may not want to be associated with these videos. Council members asked about what is known about those opting out of NeHII. Patients opt out of NeHII for a variety of reasons, including not understanding what an HIE does. Providing information to non-English speaking patients presents a challenge. The project does not have bilingual staff. It was recommended to check into what it would cost to have a separate video in Spanish. Marsha Morien informed the Council that UMNC is completing a consumer satisfaction study of health information exchange. There will be a report to the eHealth Council at a later date.

- E-Prescribing of Controlled Substances. An official letter is being drafted by the Board of Pharmacy to SureScripts indicating that e-prescribing controlled substances is permissible. Requirements for e-prescribing controlled substances include the use of two-factor authentication. It was recommended that the e-Prescribing Work Group reconvene to address e-prescribing of controlled substances.

MEMBERSHIP

Mr. Fattig moved to approve the membership nomination of Max Thacker on the eHealth Council. Ms. Medcalf seconded. All were in favor. Motion carried by unanimous voice vote.

ACTION ITEMS FOR NITC STATEWIDE TECHNOLOGY PLAN AND BROADBAND PLAN*

There were no recommended changes to the action items for the NITC Statewide Technology Plan and the broadband plan.

Mr. Schieke moved to approve the [action items for the NITC Statewide Technology Plan](#) or the [Broadband Plan](#). Mr. Fattig seconded. All were in favor. Motion carried by unanimous voice vote.

Mr. Fattig was asked to testify before the United States Senate Finance Committee about the challenges of implementing electronic health records on July 24. His testimony can be found at <http://www.finance.senate.gov/imo/media/doc/Fattig%20Testimony%20Final%20Copy.pdf>. The HIT Policy Committee is currently working on Stage 3 of Meaningful Use.

The kickoff meeting for the state broadband plan is tomorrow, November 1st, at 1526 K Street in Lincoln. The development of a state broadband plan is one component of the Nebraska Public Service Commission's broadband mapping and planning grant. The Nebraska Public Service Commission has partnered with the University of Nebraska-Lincoln, Department of Economic Development, AIM Institute and the NITC on planning activities. The state broadband plan will build on regional broadband plans. The plan will likely focus on four areas: economic development, digital literacy/adoption, broadband availability and affordability, and agriculture. Education and healthcare are being addressed by the NITC Education and eHealth Councils. Their action items can be incorporated into the state broadband plan.

Dr. Wycoff encouraged council members to feel free to contact one of the co-chairs or Ms. Byers if they have any agenda items for the next meeting.

ADJOURN

With no further business, the co-chair adjourned the meeting at 3:05 p.m.

Meeting minutes were taken by Lori Lopez Urdiales and reviewed by Anne Byers, Office of the CIO/NITC.

eHealth Council Members

The State of Nebraska/Federal Government

- **Senator Annette Dubas**, Nebraska Legislature (term ends Dec. 2010, renew every 2 years)
- **Patrick Werner** (term ends Dec. 2015)
- **Congressman Jeff Fortenberry**, represented by Marie Woodhead (term ends Dec. 2012, renew every 2 years)

Health Care Providers

- **Marty Fattig**, Nemaha County Hospital (pending approval, term ends Dec. 2013)
- **Dr. Delane Wycoff**, Pathology Services, PC (term ends Dec. 2014)
 - **Dr. Harris A. Frankel** (alternate)
- **Kevin Borchert**, Nebraska Methodist Health System and Nebraska Board of Pharmacy (term ends Dec. 2015)
- **September Stone**, Nebraska Health Care Association (term ends Dec. 2013)
 - **Jason Davis**, Vetter Health Services, Inc. (alternate)
- **John Roberts**, Nebraska Rural Health Association (term ends Dec. 2014)

eHealth Initiatives

- **Max Thacker**, Nebraska Statewide Telehealth Network and UNMC (term ends Dec. 2015)
 - **Dale Gibbs**, Catholic Health Initiatives and Good Samaritan Hospital (alternate)
- **Kevin Conway**, NeHII and Nebraska Hospital Association (term ends Dec. 2013)
- **Harold Krueger**, Western Nebraska Health Information Exchange and Chadron Community Hospital (term ends Dec. 2014)
- **Wende Baker**, Southeast Nebraska Behavioral Health Information Network (term ends Dec. 2015)

Public Health

- **Jenifer Roberts-Johnson**, Department of Health and Human Services, Division of Public Health (term ends Dec. 2013)
- **Sharon Medcalf**, UNMC College of Public Health (term ends Dec. 2014) (pending NITC approval)
 - **Rita Parris**, Public Health Association of Nebraska, alternate
- **Kay Oestmann**, Southeast District Health Department (term ends Dec. 2015)
- **Marsha Morien**, UNMC College of Public Health (term ends Dec. 2013)
- **Joel Dougherty**, OneWorld Community Health Centers (term ends Dec. 2014)

Payers and Employers

- **Susan Courtney**, Blue Cross Blue Shield (term ends Dec. 2015)
 - Rama Kolli, Blue Cross Blue Shield (alternate)
- **Vacant**, Department of Health And Human Services, Division of Medicaid and Long Term Care (term ends Dec. 2013)

Consumers

- **Vacant**
- **Alice Henneman**, University of Nebraska-Lincoln Extension in Lancaster County (term ends Dec. 2015))

Resource Providers, Experts, and Others

- **Kimberly Galt**, Creighton University School of Pharmacy and Health Professions (term ends Dec. 2015).
- **Greg Schieke, Wide River Technology Extension Center** (term ends Dec. 2013)
- **Vacant**

Nebraska State HIE Cooperative Agreement 2010-2014

Overview

On March 14, 2010, the State of Nebraska received a four-year \$6.8 million cooperative agreement from the U.S. Department of Health and Human Services' Office of the National Coordinator for Health IT. The Nebraska Information Technology Commission's eHealth Council was instrumental in developing the strategic plan which guided the implementation of the State Health Information Exchange Cooperative Agreement.

The Nebraska Information Technology Commission's eHealth Council established the following vision which is included in Nebraska's Strategic Plan:

Stakeholders in Nebraska will cooperatively improve the quality and efficiency of patient-centered health care and population health through a statewide, seamless, integrated consumer-centered system of connected health information exchanges. Nebraska will build upon the investments made in the state's health information exchanges and other initiatives which promote the adoption of health IT.

The Strategic Plan sets forth the following goals:

- Using information technology to continuously improve health care quality and efficiency through the authorized and secure electronic exchange and use of health information.
- Improve patient care and consumer safety;
- Encourage greater consumer involvement in personal health care decisions;
- Enhance public health and disease surveillance efforts;
- Improve consumer access to health care;
- Improve consumer outcomes using evidence-based practices

The plan leveraged the investments made in health information exchange, utilizing NeHIE as the state's lead health information exchange and supporting the development of a separate behavioral health network, the Electronic Behavioral Health Information Network (eBHIN). Grant funding was also used to support the electronic submission of information to public health systems. The Nebraska Statewide Telehealth Network also received support. Evaluation of the grant was conducted by a team of researchers at the University of Nebraska Medical Center.

Top Five Accomplishments

1. NeHII, Nebraska's lead health information exchange, is one of the largest health information exchanges in the country with over 2.7 million individuals in its Master Patient Index and 3,590 users as of March 14, 2014. NeHII has grown considerably since the start of the State HIE Cooperative Agreement. In March 2010, NeHII had 1.5 million individuals in the Master Patient Index and 464 users. A 2013 survey of Nebraska healthcare providers found that 63% of providers currently using NeHII were satisfied. Accessing a comprehensive patient medication list was identified as the most important feature of the health information exchange.
2. Nebraska also has one of the nation's only health information exchanges exclusively serving behavioral health information exchange providers. The Electronic Behavioral Health Information Network (eBHIN) went live with its HIE functionality in the summer of 2012 and currently has 565 users in southeast Nebraska (Region 5) and the Omaha area (Region 6). Over 19,000 unique patient IDs are included in the HIE. eBHIN is working with additional regions to address interoperability issues and exchange information through CDAs. eBHIN has developed an innovative approach to managing consent which will allow for the exchange of behavioral health information with patient consent.
3. NeHII implemented an immunization gateway in 2011, enabling the exchange of immunization records between NeHII participants and the state immunization registry. The immunization gateway accepts messages from an EHR and sends the information to the Nebraska State Immunization Information System (NESIIS). The system receives the information, validates the format specifications, transmits the data to NESIIS, receives an acknowledgement from NESIIS and can query NESIIS for immunization information about a patient. This meets the requirement for Meaningful Use Stage 2 Core Objective 13 for eligible hospitals and Core Objective 15 for eligible providers. Regional West Physicians Clinic, York General Hospital and Boys Town are currently sending information. The third phase of the project will allow NeHII users to query NESIIS and save the immunization data available in NESIIS for a patient to the provider's EMR.
4. Legislation in 2011 authorized the Nebraska Department of Health and Human Services to work with NeHII to develop a Prescription Drug Monitoring Program utilizing NeHII's medication history functionality, making Nebraska the first state to incorporate PDMP functionality into an HIE. NeHII has worked with the Nebraska Medical Association to address physician concerns. Self-pay data from nine retail pharmacy chains and five mail order pharmacies was added. NeHII also has begun offering site licenses to all participating hospitals to address physician concerns about cost. NeHII has discussed breaking out the medication query functionality so that it could be offered as a stand alone function. This will be possible when Optum migrates to a new platform.
5. The use of e-prescribing in Nebraska has grown since 2010, with Nebraska ranking 17th in Surescripts' most recent ranking of states in e-prescribing. This is particularly noteworthy considering that in 2009 only 11% of physicians in Nebraska e-prescribed. Today approximately 90% of physicians in Nebraska are e-prescribing. Pharmacy participation in e-prescribing has also increased from 81% of Nebraska community pharmacies receiving e-prescriptions in January 2011 to 95% in Feb. 2013. In 2013, Surescripts received documentation that e-prescribing controlled substances is legal in Nebraska. At this time, over 35 pharmacies are able to accept e-prescription for controlled substances. Pharmacy participation in NeHII has also continued to grow with the first pharmacists participating in 2011. As of Dec. 31, 2013, 86 pharmacists are participating in NeHII.

Lab readiness has also improved. In December 2013, 62% of labs in Nebraska were sending electronic lab results in a structured format, up from just 20% in Dec. 2011. Over a third of labs (35%) are sending electronic lab results using LOINC, up from 15% in 2011.

Lessons Learned

HIE development has been a longer and more difficult process than we imagined. Hospitals, physician practices and other providers have limited resources with which to meet many competing demands—including Meaningful Use requirements, ICD-10 compliance requirements, and HIE implementation. Since Stage 1 Meaningful Use requirements could be met largely without the use of HIE, HIE implementation has been a lower priority for many hospitals and providers.

Adoption of HIE also requires behavioral changes by providers who are already dealing with the challenges of EHR adoption and changing payment models. Like EHR adoption, successful HIE adoption and utilization may require workflow changes, staff training, and a champion within the hospital or practice. While HIE adoption efforts have focused on physicians, HIE may be more beneficial for care managers and may be more easily incorporated into their workflow.

HIE adoption is also made more challenging because HIE benefits are not evenly distributed among all participants. Patients are often the biggest beneficiary. Getting providers to see the system-level benefits can be difficult.

Vendors are also dealing with resource constraints as they deal with the developing Meaningful Use requirements and evolving standards. Many vendors are charging significant interface fees which are proving to be financial barriers for small hospitals (especially Critical Access Hospitals) and practices.

Nebraska's rural geography and population poses challenges in implementing health information exchange. Nebraska has 65 Critical Access Hospitals (CAHs), more than all but four states (Kansas, Iowa, Texas, and Minnesota). There is a wide disparity in available resources, both financial and human, across Nebraska Critical Access Hospitals. Most Critical Access Hospitals in Nebraska are implementing electronic health records and have attained Meaningful Use. Wide River TEC worked with 55 Critical Access Hospitals and the state's single rural hospital, with 51 CAHs attaining Go-Live (Milestone 2) and 49 CAHs attaining Meaningful Use (Milestone 3). Six Nebraska Critical Access Hospitals currently participate in NeHII with an additional 16 Critical Access Hospitals in Nebraska pending implementation. The IAPD submitted to CMS in July 2013 includes funding for CAH implementation and will greatly facilitate efforts to connect CAHS.

Plans to Address Gap Areas

Although NeHII has added users and hospitals during the four-year grant period, gaps in adoption remain with approximately one-third of physicians in the state utilizing NeHII, approximately one-fourth of the hospitals participating in NeHII and 52% of the hospital beds covered by NeHII. NeHII has set a goal of having 80% of hospital beds covered by NeHII and 80% of physicians participating in NeHII. A funding request (IAPD) for Medicaid 90/10 matching funds was submitted by Nebraska's Medicaid program in July 2013 to facilitate adoption by physicians and hospitals and is still awaiting final approval. NeHII's new site license program should also facilitate physician adoption.

eBHIN serves behavioral health providers in the two most populated areas of the state--southeast Nebraska (Region 5) and the Omaha area (Region 6). These two regions together serve 65% of the behavioral health patients eligible for publicly assisted care, leaving a coverage gap of 35% of behavioral health patients eligible for publicly assisted care. eBHIN is looking at ways to further develop its capabilities and infrastructure appropriately, including looking at exchanging information with other regions using Clinical Document Architecture (CDA).

Data through NeHII is mainly provided by participating hospitals (including their labs) and Surescripts. Data from ambulatory providers is largely missing. NeHII is exploring parsing data from ADT (admission, discharge, transfer) feeds to provide additional patient data.

Efforts will also focus on increasing the utilization of both eBHIN and NeHII and helping providers in Nebraska better understand the value of health information exchange to patients and the health care system.

Nebraska State HIE Cooperative Agreement 2010-2014 Metrics

NeHII	March 2010	March 2014	% Change
Number of Clients			
• Number of Clients in the Master Patient Index	1,544,570	2,703,439	75%
• Total Patients That Have Opted Out	27,032	69,020	155%
• Total Patients Opting Back In	2,092	4,372	109%
Provider Information			
• Total Number of Users	464	3,590	674%
Hospital Information			
• Number of Nebraska Hospitals Participating	8	22	175%
• % of Nebraska Hospitals Participating	8%	23%	188%
• Percent of Nebraska Hospital Beds Covered	36%	52%	44%
Public Health Information			
• State Public Health Systems Connected to NeHII	0	1 ¹	
• Local Health Departments Participating in NeHII	0	2	
Payers			
• Number of Payers Participating	1	2	100%
Total Number of Results Sent to Exchange			
• LAB	6,633,699	38,411,495	479%
• RAD	1,838,874	7,399,077	302%
• Transcription	947,739	16,623,562	1654%

¹ In 2011, NeHI implemented the immunization gateway.

eBHIN	March 2010	March 2014
Number of Clients		
• Number of Clients in the Master Patient Index	0	18,326
• Percentage of Clients That Have Opted Out	0	32%
• Percentage of Clients Opting Back In	0	6%
Provider Information		
• Total Number of Users	0	565

E-Prescribing	Jan. 2011	Feb. 2014	% Change
Pharmacies Participating			
• Pharmacies on Surescripts Network	363	429	18%
• Total Number of Community Retail Pharmacies	436	446	2%
• % of Community Retail Pharmacies on Surescripts Network	83%	96%	16%
• Pharmacies Enabled for E-Prescribing for Controlled Substances	0	Over 35	
Provider Information			
• Total Prescribers	1,399	4,095	193%
• MDs Prescribing	1,006	3,042	202%
• Estimated Percent of MDs Prescribing	31%	91%	194%

Labs Sending Results in Structured Format	Dec. 2011	Dec. 2013	% Change
• % of Labs Sending Electronic Lab Results to Providers in a Structured Format	32%	62%	92%
• % of Labs Sending Electronic Lab Results to Providers Using LOINC	12%	35%	181%



Health Information Exchange Evaluation

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University of Nebraska Medical Center

College of Pharmacy and College of Public Health

April 10, 2014

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EXECUTIVE SUMMARY

On March 14, 2010, the State of Nebraska received a four-year \$6.8 million cooperative agreement from the U.S. Department of Health and Human Services' Office of the National Coordinator for Health IT. The Nebraska Health Information Initiative (NeHII) has served as the state's lead health information exchange and is one of the largest statewide health information exchanges in the country, growing from 464 users in 2010 to over 3,500 users in 2014.

This project was a first comprehensive evaluation of utilization and usage of HIE in Nebraska. The purpose of this evaluation was to conduct a comprehensive assessment of Nebraska HIE including the opinions of providers and consumers, prescription drug monitoring program, errors associated with e-prescribing, radiology and laboratory data, and pharmacists' perspectives.

To evaluate providers' barriers and reasons to adopt HIE, we surveyed Nebraska healthcare providers. The most common reasons for adoption were improvement in patient care as well as receiving and sending information in the referral network. Also, accessing a comprehensive patient medication list was identified as the most important HIE feature. Participants' major barriers to adoption were cost and loss of productivity.

Consumer participation is a necessary component of HIE utilization. We evaluated consumers' opinions by conducting 8 focus groups across Nebraska. Consumer concerns focused on privacy and security of medical information, lower quality of care, inconsistent provider participation, and potential cost. Positive feedback included accuracy and completeness of information, improved communication, coordination and access to information between health care providers. Enhanced

HIE features may allow consumers to become fuller participants in their own healthcare management and increase HIE utilization.

Also, we estimated the prevalence of unintended discrepancies by comparing prescriber's notes, electronic prescriptions, and dispensed medications. The discrepancy rate between the prescriber's note and the e-prescription ranged from 0.6% to 3.9%. The discrepancy rate between the e-prescription and the prescription label ranged from 0.9% to 4.2%. Difference between directions for administration was the most common type of discrepancy identified. To reduce outpatient medication errors, a better understanding is needed of the sources of discrepancies that occur within the prescriber's clinic, and those that occur between the clinic and pharmacy.

Our final evaluation project focused on the emergency room prescriber utilization and satisfaction with Nebraska's Prescription Drug Monitoring Program (PDMP). Participating emergency room physicians received training and four months of free access to the PDMP. The utilization of HIE was lower than expected. Incomplete information and impact on workflow were reported as barriers to HIE utilization for PDMP purposes. In addition, low perceived need for PDMP and prescriber preparedness to manage abusers may also have reduced utilization.

Knowledge of the existing barriers to implementation and desired features may help policymakers facilitate HIE expansion in Nebraska and across the US.

INTRODUCTION

As the potential financial and medical benefits of Health Information Exchange (HIE) continue to be explored nationally, the roll out of such systems has been met with both optimistic expectation and resistance due to the perceived barriers.^{1,2} Widespread use of HIE systems around the country is a key aspect of the American Recovery and Reinvestment Act with the goals of more efficient information sharing, and ultimately the formation of a National Health Information Network (NHIN).³ Since 2009, HIE in Nebraska has been provided by the Nebraska Health Information Initiative (NeHII) and currently includes 2,186 healthcare professionals.⁴

Evaluation of NeHII implementation barriers among physicians and assessment of the desired NeHII features are needed to facilitate usage and implementation. Other states have discovered that while many physicians see HIE as likely to have positive impact on patient care, payment for access to the system is a common concern. Utility is associated with the willingness of patients and physicians to contribute information into the data sharing systems. Practitioners' rating of a HIE's helpfulness is associated with the completeness of the available data. In addition, completeness of data is contingent on the belief that system security is maintained adequately. Thus, data sharing is linked intrinsically with patient privacy.⁵

The purpose of this evaluation was to conduct a comprehensive assessment of Nebraska HIE including the opinions of providers and consumers, prescription drug monitoring program, errors associated with e-prescribing, radiology and laboratory data, and pharmacists' perspectives. This is the first such study in Nebraska. Knowledge of the existing barriers to implementation and desired features may help policymakers facilitate HIE expansion in Nebraska and across the US.

HEALTH INFORMATION EXCHANGE IN NEBRASKA – PROVIDER SATISFACTION

Health Information Exchange (HIE) systems are implemented nationwide to better integrate patient health information and facilitate communication among healthcare providers. The HIE in Nebraska is provided by the Nebraska Health Information Initiative (NeHII). The objectives of this study were to evaluate provider satisfaction with HIE in Nebraska and to determine utilization barriers.

We surveyed 5,618 Nebraska healthcare providers in 2013 and received 615 completed questionnaires (11%). One hundred providers (16%) were NeHII users and 19 providers (3.1%) indicated intention to use NeHII within the next 12 months. Of the 100 providers currently using NeHII, 63 (63%) indicated satisfaction with NeHII. The most common reasons for adoption among those who have ever used HIE (N=198) were improvement in patient care (N=111, 56%) as well as receiving (N=95, 48%) and sending information (N=80, 40%) in the referral network. Cost (N=233, 38%) and loss of productivity (N=220, 36%) were indicated as the “major barriers” to adoption by all participants. Accessing a comprehensive patient medication list was identified as the most important feature of the HIE (N=422, 69%).

Because cost and loss of productivity were identified as the primary areas of concern among providers, streamlining HIE access through integration with Electronic Medical Records to minimize workflow interruption, as well as keeping costs reasonably low for providers may increase participation. More efficient access to laboratory values and medication information were indicated as important features for providers and emphasizing these benefits may also help increase participation. Finally, additional education for providers on HIE practice integration may alleviate perceived barriers

in the areas of technical support and staff training, which may move provider expectations toward the benefits that HIE can offer.

CONSUMER OPINIONS OF HEALTH INFORMATION EXCHANGE IN NEBRASKA

Consumer satisfaction is a crucial component of Health Information Exchange (HIE) utilization, as high satisfaction is expected to increase HIE utilization among providers and to allow consumers to become full participants in their own healthcare management. The main objective of this study was to identify consumer perspectives on HIE, e-Prescribing, and use of Personal Health Records as well as concerns surrounding health information security and privacy.

Eight focus groups were conducted in seven towns and cities across Nebraska. There were 67 participants, 18 (27%) were male. Concerns included privacy and security of medical information, decreases in quality of care, inconsistent provider participation, and potential cost. Positive feedback included accuracy and completeness of information, improved communication, coordination and access to information between health care providers.

Improvements in patient care were expected due to easy physician access to consolidated information across providers as well as speed of sharing and availability of information in an emergency. In addition, participants were optimistic about patient empowerment in convenient access to and control of personal health data. Consumer concerns focused on privacy and security of the health information, as well as technology, cost, and quality of care. While negative perceptions present barriers for potential patient acceptance and use of HIE in Nebraska, benefits such as speed and convenience, patient oversight of health data, and safety improvements may provide counter-balance.

FROM PHYSICIAN INTENT TO THE PHARMACY LABEL: EVALUATION OF ELECTRONIC PRESCRIPTIONS

The objectives of this cross-sectional study were to estimate the prevalence of unintended discrepancies between three sources of prescription information and to describe the types of electronic prescribing system vulnerabilities identified.⁶ Staff from community pharmacies identified approximately 200 new prescriptions written at three participating ambulatory care clinics (2 adult, 1 pediatric). Unintended discrepancies were identified by comparing three sources of prescription information: (1) the prescriber's note as documented in the patient's chart; (2) the electronic prescription (e-prescription) entered into the clinic's electronic prescribing software; (3) the medication that was ultimately dispensed by the pharmacy as indicated on the prescription label. The discrepancy rate was calculated by dividing the number of discrepancies identified by the number of prescriptions evaluated.

A total of 602 prescriptions written by 33 prescribers were evaluated from the 3 ambulatory care clinics. The discrepancy rate between the prescriber's note and the e-prescription was 1.7%, 0.6% and 3.9% for the three clinics. The discrepancy rate between the e-prescription (clinic) and the prescription label (pharmacy) was 4.2%, 0.9% and 1.5%. Difference between directions for administration was the most common type of discrepancy identified. Discrepancy rates between the prescriber's note and the e-prescription were similar to the discrepancy rates between the e-prescription and pharmacy label. To reduce outpatient medication errors, a better understanding is needed of the sources of discrepancies that occur within the prescriber's clinic, and those that occur between the clinic and pharmacy.⁶

RADIOLOGY AND LABORATORY DATA

The objective of this project was to determine if access to results of diagnostic laboratory and radiology tests through the health information exchange reduces the rate of redundant testing. This was intended to be one of the first true outcomes studies related to HIE utilization. Completion of this project required both access and utilization of the HIE to be at high levels and for access to data using Optum's data analytics tool.

While there has been steady growth in the number of laboratory test results and radiology reports (radiology images are not yet available) available through NeHIE, the team was unable to secure access to the data analytics tool. Without that information, it was not possible to determine how often laboratory and radiology results were utilized. The lack of utilization data limited the ability of the evaluation team to compare rates of redundant testing. Because reduced redundancy is one of the major purported benefits of HIEs, the evaluation team has committed to completing this project when the data become available.

UTILIZATION OF MEDICATION HISTORY

The objective of this project was to determine whether access to formulary and eligibility information improves medication adherence and generic utilization rates by making such information available at the time of prescribing. This study represented an outcomes study, which required both access and utilization of the HIE to be at high levels and for access to data using Optum's data analytics tool.

The results of other project within the evaluation demonstrated that medication histories or queries are viewed as an important part of a HIE though its use seems to be related more to medication reconciliation and prescription drug monitoring, than to formulary or eligibility information.

Our inability to access the data analytics tool and the gap in availability of medication histories from January to May 2013, made it impossible to compare medication adherence or generic utilization rates between patient groups. With the notable exception of the gap in availability, medication queries have increased significantly over time.

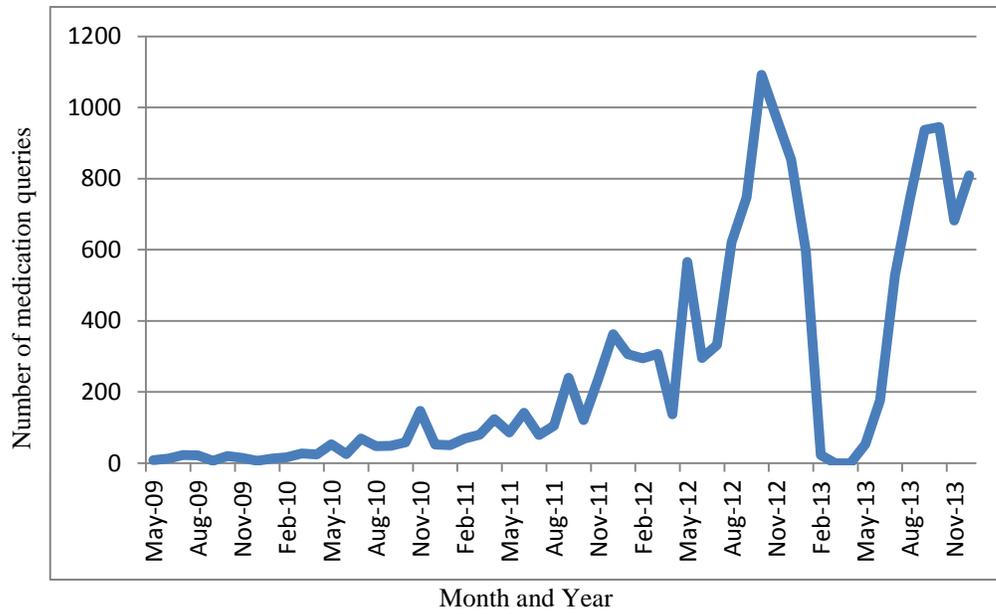


Figure 1. The number of medication queries per month and year, NeHII, 2009-2013

The current lack of medication histories in NeHII makes the evaluation difficult. Until the medication histories and analytics become available, the evaluation team is considering other projects to address the value of medication histories.

VALUE OF HEALTH INFORMATION EXCHANGE IN THE EMERGENCY DEPARTMENT – PRESCRIPTION DRUG MONITORING PROGRAM

Nebraska is the first state to incorporate its Prescription Drug Monitoring Program (PDMP) into its statewide Health Information Exchange (HIE). The objective of this study was to conduct a preliminary evaluation of emergency room (ER) prescriber utilization and satisfaction with Nebraska's PDMP.

ER prescribers were provided training and four months of free access to the PDMP. Prescribers were surveyed every two weeks to estimate the number of times they looked for and found PDMP related information. A final survey was administered to evaluate satisfaction, usefulness, and barriers to utilization.

Seventeen providers from three emergency rooms agreed to participate. Six providers completed fourteen of the 119 (13%) bi-weekly surveys. Five of the 17 (29%) participants completed the final survey. Providers accessed the HIE for 65 of 347 (19%) ER patients. Participants reported that prescription history was available for 3% of queries. Problem lists, clinic or hospital notes, and laboratory reports were reported to be available 60% of the time.

Barriers to HIE utilization for PDMP purposes were incomplete information and impact on workflow. Low perceived need for a PDMP and prescriber preparedness to manage abusers may also have reduced utilization. Financial and human resources are rarely allocated by a provider's institution for HIE implementation. Many HIEs are struggling to achieve sustainability and have limited resources to

support training. Minimizing missing information is necessary to increase utilization. Financial and human resources are required for training and integration of a HIE based PDMP in the ER.

NEBRASKA LAB CENSUS

As part of the ongoing evaluation by to the Office of the National Coordinator (ONC), all State Health Information Exchanges are required to conduct a census of hospital and independent laboratories within their respective states. The primary objective of the report was to determine the number of labs sending electronic results to ambulatory providers outside of their organization in a structured format in 2011, 2012, and 2013. In addition, the ONC required data on whether labs were complying with the Logical Observation Identifiers Names and Codes (LOINC) standards.

A telephone survey of all laboratories in Nebraska was conducted by a trained caller using a structured script.

Summation of Key findings between 2011 and 2013:

Labs sending results to ambulatory providers outside of their organization electronically in a structured format

	2011	2012	2013	% Change 2011-2013
Hospital Labs	17/93 (18.3%)	35/93 (37.6%)	55/93 (59.1%)	+223%
Independent Labs	25/37 (67.6%)	26/37 (70.3%)	26/37 (70.3%)	+4%
All Labs	42/130 (32.3%)	61/130 (46.9%)	81/130 (62.3%)	+92%

Labs following LOINC standards for test results sent to ambulatory providers outside of their organization

	2011	2012	2013	% Change 2011-2013
Hospital Labs	13/93 (13.9%)	25/93 (26.9%)	42/93 (45.2%)	+225%
Independent Labs	3/37 (8.1%)	3/37 (8.1%)	3/37 (8.1%)	0%
All Labs	16/130 (12.3%)	28/130 (21.5%)	45/130 (34.6%)	+181%

BARRIERS TO ELECTRONIC PRESCRIBING: NEBRASKA PHARMACISTS' PERSPECTIVE

Electronic prescribing (e-prescribing) and its accompanying clinical decision support capabilities have been promoted as means for reducing medication error and improving efficiency and there has been a coordinated effort to increase the utilization of e-prescribing and other healthcare information technologies the United States. The objectives of this study were to identify the barriers to adoption of e-prescribing among all non-participating Nebraska pharmacies and to describe how the lack of pharmacy participation impacts the ability of physicians to meet meaningful use criteria. We used open ended questions and structured questionnaire to capture participants' responses.⁷

Of the 23 participants, 10 (43%) reported planning to implement e-prescribing sometime in the future due to transaction fees and maintenance costs as well as demand from customers and prescribers to implement e-prescribing. Nine participants (39%) reported no intention to e-prescribe in the future citing startup costs for implementing e-prescribing, transaction fees and maintenance costs, happiness with the current system, and the lack of understanding about e-prescribing's benefits and how to implement e-prescribing.⁷

The barriers to e-prescribing identified by both late adopters and those not willing to accept e-prescriptions were similar and were mainly initial costs and transaction fees associated with each new prescription. For some rural pharmacies, not participating in e-prescribing may be a rational business decision. To increase participation, waiving or reimbursing the transaction fees, based on demographic or financial characteristics of the pharmacy, may be warranted.⁷

NEBRASKA STATE HIE MATRIX

Metrics for the Nebraska State HIE Cooperative Agreement for 2010- 2014 can be found below:

NeHII	March 2010	March 2014	% Change
Number of Clients			
• Number of Clients in the Master Patient Index	1,544,570	2,703,439	75%
• Total Patients That Have Opted Out	27,032	69,020	155%
• Total Patients Opting Back In	2,092	4,372	109%
Provider Information			
• Total Number of Users	464	3,590	674%
Hospital Information			
• Number of Nebraska Hospitals Participating	8	22	175%
• % of Nebraska Hospitals Participating	8%	23%	188%
• Percent of Nebraska Hospital Beds Covered	36%	52%	44%
Public Health Information			
• State Public Health Systems Connected to NeHII	0	1 ¹	
• Local Health Departments Participating in NeHII	0	2	
Payers			
• Number of Payers Participating	1	2	100%
Total Number of Results Sent to Exchange			
• LAB	6,633,699	38,411,495	479%
• RAD	1,838,874	7,399,077	302%
• Transcription	947,739	16,623,562	1654%

¹ In 2011, NeHII implemented the immunization gateway.

eBHIN	March 2010	March 2014
Number of Clients		
Number of Clients in the Master Patient Index	0	18,326
Percentage of Clients That Have Opted Out	0	32%
Percentage of Clients Opting Back In	0	6%
Provider Information		
Total Number of Users	0	565

E-Prescribing	Jan. 2011	Feb. 2014	% Change
Pharmacies Participating			
Pharmacies on Surescripts Network	363	429	18%
Total Number of Community Retail Pharmacies	436	446	2%
% of Community Retail Pharmacies on Surescripts Network	83%	96%	16%
Pharmacies Enabled for E-Prescribing for Controlled Substances	0	Over 35	
Provider Information			
Total Prescribers	1,399	4,095	193%
MDs Prescribing	1,006	3,042	202%
Estimated Percent of MDs Prescribing	31%	91%	194%

Labs Sending Results in Structured Format	Dec. 2011	Dec. 2013	% Change
% of Labs Sending Electronic Lab Results to Providers in a Structured Format	32%	62%	92%
% of Labs Sending Electronic Lab Results to Providers Using LOINC	12%	35%	181%

LESSONS LEARNED

The main objectives of this evaluation focused on HIE utilization and outcomes. Six evaluation projects were developed to assess different aspects of HIE. We planned to evaluate perspectives of all key participants such as consumers, physicians, pharmacists, and emergency department physicians. All studies found low familiarity with HIE and subsequently utilization of HIE. The lower than anticipated utilization may be attributed to several potential barriers.

First, incomplete information is a significant barrier for HIE utilization and may discourage future attempts to utilize HIE among providers.⁸⁻¹⁰ Participants in the PDMP study reported that relevant PDMP information was available for only 2 patients out of 65 queries. Medication history and radiology images were ranked as 'very important' features in the provider satisfaction survey. The radiology images feature is absent from the current HIE functionality and the medication feature was temporarily unavailable at the time the survey was conducted. Dissatisfaction with incomplete information was reported in the survey comments. These highly important features of HIE must be continuously enhanced to provide value for providers.

Second, there must be efficient workflow integration for the HIE system to be useful for providers. Providers ranked loss of productivity as a major barrier to HIE implementation and single sign-on as very important in HIE. It is possible that nurses or office managers may be better positioned than physicians to review HIE and collect information on the patient's medication history. In addition, an indicator of the HIE record availability will alleviate unsuccessful information queries and delays in patient care. Clinical practices always strive to operate more effectively and a single sign-on with efficient workflow integration are crucial for HIE adoption and utilization.¹⁰⁻¹⁴ Although cost of HIE was previously reported as a utilization barrier, free HIE access did not result in

widespread usage in our PDMP study, indicating that other factors may serve as stronger barriers to utilization.

Third, education and training are necessary to demonstrate the utility of HIE in the clinical setting. Specialty-specific use cases can be developed to demonstrate the utility of HIE. Also, use cases available online can help educate providers on the HIE benefits more efficiently than in-person training sessions currently conducted. Such use cases could also address the low perceived need of using HIE when another system EHR is readily available. For example, use case of searching and locating PDMP information in HIE will be useful for ER physicians when a patient presents with acute pain.

Fourth, privacy and confidentiality in sharing medical information are major barriers to widespread consumer utilization.¹⁵⁻¹⁷ This may be especially applicable for older consumers who are uncomfortable with using technology. As with other medical record systems, appropriate safeguards and firewalls must be in place for HIE systems to be effective. In addition to the general privacy safeguards, access for only authorized providers, documentation of access, and patient portal to check for the accuracy of own medical information were reported as desired HIE features in the consumer focus groups. Sufficient education of consumers and providers will help address these concerns and ensure consumer participation. Consumers expressed their preference to learn about HIE from their providers.

Continuous evaluation is crucial in any system for benchmarking and quality improvements. It is necessary to monitor utilization on a system-wide scale to adequately evaluate HIE performance. The HIE usage analytics were not available at the time of this study was conducted and could not be incorporated in this comprehensive evaluation. Inability to monitor utilization prevents identification of

system strengths and required areas for improvement. In addition, readily available utilization data can show the impact of various education and training programs as they are being implemented.

RECOMMENDATIONS

Addressing identified barriers may increase utilization and improve patient outcomes. Policy makers working to develop and implement HIE programs should focus on increasing completeness of the available medical information, education and training including use cases, clinical workflow analysis and integration, technological improvements, and continuous evaluation to ensure successful HIE implementation and usage.

In the future, we will focus on the value of HIE by looking beyond participation of health systems, providers, and consumers to reviewing how the information is used in practice. Improvements in evidence-based practice that are based on HIE will move us in the direction of being able to assess if HIE leads to significant changes in outcomes. While HIE adoption in the Emergency Department setting and for Prescription Drug Monitoring are very important use cases, we need to demonstrate that HIE is useful for management of patient referrals with acute and chronic diseases over the continuum of care. Patient and family/caregiver involvement related to their priorities for access to information for decision making and communications with providers will form a central focus of future evaluation studies.

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Internet Connectivity and Use in Nebraska: A Follow Up Study

A new report on a survey of Nebraska households on their broadband access and utilization is now available at <http://broadband.nebraska.gov/household-survey-20141>. Some of the findings have implications for eHealth efforts.

- Almost nine in ten households in Nebraska (86%) have Internet access at home. This has increased over the past four years, from 81 percent in 2010.
- More than eight in ten Nebraska households (82%) currently have broadband Internet service. In 2010, 76 percent of Nebraska households had broadband service.
- A very high proportion (95%) of households with children and persons age 19 to 39 (95%) have broadband service.
- Similar to Internet access, the groups less likely to have broadband service include: older persons, persons with lower incomes, persons with lower education levels, and households without children.
- However, during the past four years the proportion of persons age 65 and older having broadband service at home increased from 48 percent to 64 percent. And, the proportion of persons with the lowest household incomes having broadband service at home increased from 44 percent to 53 percent.
- Persons living in metropolitan areas are more likely than persons living in nonmetropolitan areas to have broadband. Ninety percent of persons living in the Lincoln area and 87 percent of persons living in the Omaha area have broadband service at home. In comparison, 73 percent of persons living in the Central Nebraska area have broadband service.
- Most Nebraska households believe the following broadband applications are important: **exchanging health information so that providers have a complete health record when treating you (82%)**, purchasing goods online (80%), online banking (79%), taking advantage of distance learning opportunities (78%), **using telehomecare to monitor chronic health conditions (76%)**, **using telemedicine to consult with health care providers (75%)**, and using government services online (paying for taxes or applying for licenses online) (75%).

